

# Rise of digital finance: Tokenising mining & metals assets

---

Can tokenised mining royalties and metal streams unlock a new investor base?



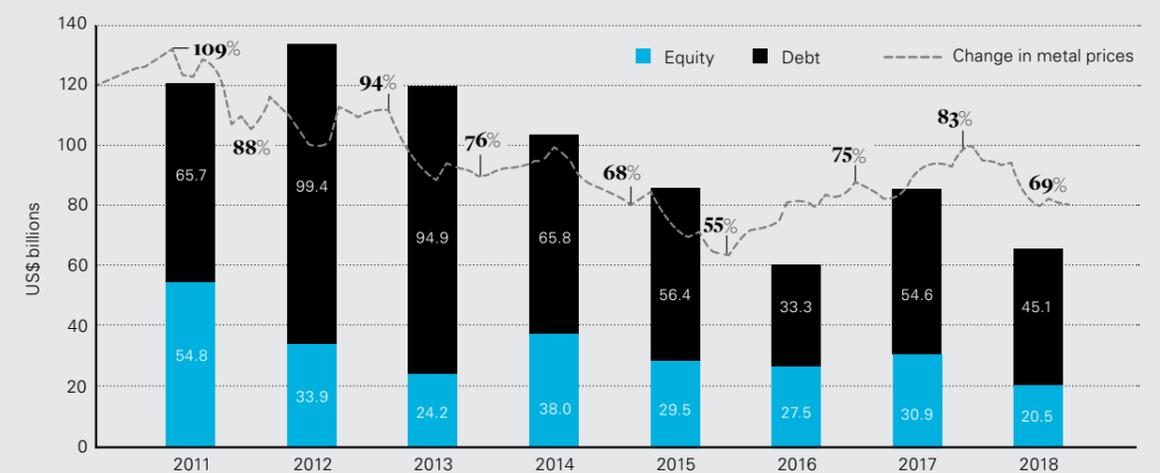
# Rise of digital finance: Tokenising mining assets & metal streams

As challenging financing conditions continue to persist in the mining & metals sector, **Rebecca Campbell** and **Andrzej Omietanski** of global law firm White & Case LLP explore the possibility of tapping into a newer and more diverse investor base via blockchain-based digital finance techniques

*The authors would like to thank Arnoud Star Busman, Chief Executive Officer of MineHub Technologies, Inc. (formerly Innovation Lead at ING), Alison Mangiero, President of the Tocqueville Group (TQ), Prat Vallabhaneni, partner, and Laura Kitchen, associate of White & Case LLP, for their contributions to this article.*

**R**apid advances in blockchain technology are reinventing the way companies operate and deliver products and services to their clients. These changes are particularly visible in the mining & metals industry, a sector that has been traditionally slow in adopting technological innovations. Yet blockchains and smart contracts, which to this point the sector has focused on as a source of productivity and transparency gains for the mining & metals global supply chain, could herald new sources of finance too. Miners face a persistently challenging environment to raise equity and equity-like capital to fund ventures. According to the *State of Mining Finance 2019 Report* produced by the Prospectors & Developers Association of Canada and junior financing tracker Oreninc, funds raised via equity in 2018 were at the lowest recorded level in the past decade, with equity funding dropping approximately 40 per cent from 2017 to 2018. Could blockchain-based digital finance techniques provide a funding solution to miners?

Financing for the global minerals industry



Sources: S&P Global Market Intelligence and PDAC analysis; Mining.com



	ICO	IEO	STO
<b>What is it?</b>	A blockchain-based fund-raising mechanism in which new crypto-tokens (i.e., a scarce digital asset defined by a blockchain protocol and exchanged via that blockchain system) are created and sold to purchasers <b>by the project itself</b> in exchange for fiat (i.e., government issued) money and/or cryptocurrencies, typically Bitcoin or Ethereum	A variation of the ICO where the project mints tokens and sends them to an exchange. <b>The exchange then issues and sells the tokens</b> , without going through the initial ICO step where users first give their money directly to the project	A security token offering is an offering of a digital asset that is <b>structured to comply with applicable securities regulations</b> . It is effectively the same as a regulated investment, wrapped in a digital token structure
<b>Key (select) benefits for issuer</b>	<ul style="list-style-type: none"> <li>Generally, a faster and easier fundraising method than traditional methods</li> <li>Due to the online nature of marketing and automated settlement (via a blockchain platform), costs are typically lower</li> <li>May avoid equity dilution</li> <li>Can isolate economics in one asset or product line via cryptoeconomic design</li> <li>Limited disclosure requirements (depending on type of token)—whitepaper and website</li> </ul>	<ul style="list-style-type: none"> <li>May create liquid market (if token listed on a token exchange) which may attract more investors and potentially more investment</li> <li>Tokenisation allows fractionalisation which further drives liquidity</li> <li>Attracts a different investor base to the mining &amp; metals sector</li> <li>Expertise and guidance from exchange on exchange listing, development of project, marketing</li> <li>Tap into existing market participants of the exchange and shared marketing costs</li> <li>Leverage credibility of exchange</li> </ul>	<ul style="list-style-type: none"> <li>Lower transaction costs compared to traditional investment contracts</li> <li>Add credibility and certainty that token is issued in accordance with regulations</li> <li>Provides comfort to investors that token is robust and regulated, and opens door to institutional investors</li> <li>Through tokenisation, possible to code regulations into the token, allowing issuers to authorise trading without having to worry about running afoul of regulations (issuing tokens instead of certificates eliminates recordkeeping costs and increases shareholder liquidity)</li> </ul>
<b>Key benefits for investors</b>	<ul style="list-style-type: none"> <li>A listed token issuance creates a liquid market and allows investors to trade in and out of their positions relatively easily</li> <li>May offer a liquidity premium for investors and the opportunity to see gains more quickly and to take profits out more easily</li> <li>May be able to reach a broader investor base (democratisation) compared to traditional securities and <b>attract a different investor base to the mining &amp; metals sector</b></li> <li>Typically can be accessed by any (retail) investor—may not have to be an “accredited investor”</li> <li>Certain tokens, and in particular cryptocurrencies (or “exchange tokens”), can appreciate/depreciate quickly in value (Bitcoin was worth US\$100 in 2013 and in December 2017 it was trading just under US\$20,000)</li> </ul>	<ul style="list-style-type: none"> <li>Provides comfort that token has been “vetted” by the exchange</li> <li>Allows for newly minted token to be held on the exchange platform together with other assets/tokens held by the investor on the platform (in one place)</li> </ul>	<ul style="list-style-type: none"> <li>Provides investors an instrument type and offering structure within a well-understood securities law framework</li> </ul>
<b>Example</b>	Ethereum ICO (Q3 2014)	BitTorrent IEO (Q1 2019)	Aspen Coin STO (Q4 2018)
<b>AML/KYC</b>	An investor may have to go through a AML/KYC process, as set up by the project	Conducted by the exchange as a condition to signing up and purchasing tokens	High level of AML/KYC in compliance with regulations
<b>Level of regulation</b>	Low	Low/Medium	High*

\*Under US federal securities laws, the security token would be structured and classified as an “investment contract” under the *Howey* test and therefore subject to US federal securities laws. Each US state and jurisdiction would also apply its securities laws to the instrument and offering as well as to the parties making a market in the security instrument.

\*Under English law, the security token would be structured and classified as a “Specified Investment” and therefore subject to the “regulatory perimeter” of the Financial Conduct Authority (FCA), and the relevant UK securities regulations. FCA’s guidance clarifies that security tokens include tokens that grant holders some (or all) of the rights conferred on shareholders or debt-holders, as well as those tokens that give rights to other tokens that are themselves Specified Investments. The most relevant Specified Investments for tokens are likely to be shares, debt instruments, warrants, certificates representing certain securities, units in collective investment schemes, and rights and interests in investments.

\*When structuring a security token under other laws, it is important to note that the definition of a “security” is not standardised globally, and therefore the nature of the token has to be assessed for every jurisdiction in which the token is sold or in which the issuer operates to establish whether a specific token constitutes a security in that jurisdiction and therefore triggers the application of any respective securities regulation.

Digital token offerings have emerged in the last few years as a new way to fund the development of emerging technologies. With their unique benefits, they are well placed to emerge as an alternative or a supplement to traditional financing options available to mining companies.

#### ICOs: a recap

The first example of a blockchain-based digital token offering was an initial coin offering (ICO) by Omni Layer, formerly known as Mastercoin, in early 2013. Omni is a digital currency and communications protocol built on the Bitcoin blockchain. Since the first ICO in 2013, ICOs have, in short, exploded. An ICO is a method of raising capital in which investors participate in the fundraising by transferring government currencies (fiat), and/or cryptocurrencies to the issuer in exchange for digital tokens. The tokens represent a holder’s right of benefit or performance vis-à-vis the issuer.

The underlying technology of the tokens is based on blockchain, which is maintained by a distributed network of computers and participants. Using cryptography to record transactions, blockchains such as Bitcoin and Ethereum process, verify and track the trade of the relevant virtual currency (e.g., Bitcoin or Ethereum) securely across independent network components on a “peer-to-peer” basis. In summary, blockchains, and in particular public blockchains, can remove the need for a variety of intermediaries, at least from a technical point of view. Legally, what is necessary will be facts and circumstances specific and dependent on the jurisdictions involved (cf private blockchains, which are hosted by central parties and are by definition more controlled in a “walled-garden” style approach which can be desirable from a variety of standpoints, such as compliance).

#### From ICOs to STOs

Digital token offering structures have evolved—at a great pace—from

initial coin offering to initial exchange offering (IEO) to security token offering (STO). ICOs have gained the most publicity out of those structures as an innovative “peer-to-peer” financing mechanism, raising more than US\$5 billion in 2017 and more than US\$11 billion in 2018, with some estimates of more than US\$20 billion. But following the bursting of the “ICO bubble” in early 2018 and the negative press around various ICO scams, the (mostly unregulated) ICO market has been gradually drying out, while IEOs and STOs have been gaining traction. Issuers and investors are turning to more refined digital capital-raising solutions, giving more thought to compliance as regulators all around the world begin to formulate and crystallise their approaches to digital token offerings.

Digital token offerings are relatively easy to structure because of technologies like the ERC20 token—issued on the Ethereum blockchain—which simplifies the process necessary to create and distribute a new cryptographic asset. This allows issuers to prepare and launch token offerings quickly and effectively.

#### Miners keen on creative financing structures

As challenging financing conditions continue to persist, miners have been looking for creative financing options to fund their ventures, and in particular their growth projects. While traditional financing options—bonds, loans, project



~40%

drop in equity funding in global mining finance from 2017 to 2018

Source: State of Mining Finance 2019 Report, Prospectors & Developers Association of Canada

finance, prepayment, convertible bonds, equity—remain generally the most attractive and understood, it is now common for companies to access multiple financing sources to diversify their capital structure, combining traditional financing options with alternative financing sources—royalty, streaming and/or private debt. Mining royalty and metal streaming financings have been particularly popular with miners in the last decade as an alternative financing source for growth projects, allowing access to early-stage capital without diluting equity ownership.

#### What is mining royalty finance?

A mining royalty is a right to receive payment based on a percentage of mineral production or of the revenues or profits generated from the sale of those minerals at a mine. A royalty typically involves an up-front payment to the mining company from the royalty holder (i.e., investor) in return for a contractual undertaking from the mining company to pay a specified percentage of future revenue for a specified period. This can be based on a percentage revenue based on, for example, profit, net smelter return or production. The up-front payment received from a mining royalty investment can be used for many purposes, from general corporate purposes and capex to acquisitions and even exploration.



**We need to reinvent ourselves... we are an old industry and there is no doubt we have changed and modernised... But we have not changed to the same extent that we have seen other industries reinvent themselves...**

Jean-Sébastien Jacques, Rio Tinto CEO, October 2018

The flexibility and profit-sharing mechanism of mining royalty finance is particularly attractive as it allows mining companies, at various stages of their life cycle, to access up-front funding as a substitute to an equity raise to fund feasibility studies or debt in order to fund the development and construction of an asset.

Taking the traditional mining royalty finance model and combining it with an innovative digital financing wrapper in the form of an STO could provide a very attractive business model for both mining companies wishing to raise capital and for investors. Similarly, the mining stream financing model—a metals prepayment structure commonly used in the sector—would be potentially amenable to tokenisation. This may require the investor to accept a physical commodity settlement and is likely to evolve after “royalty tokenisation” has taken hold.

### Royalty mining token: Structure and legal framework for an STO

There are many ways and options to structure a mining royalty token which includes investment from both US investors and non-US investors. For instance, a mining royalty token issuance could be split into two simultaneous token offerings—“Series A Tokens” and “Series B Tokens”—to ensure a “light regulatory burden” in compliance with US Securities Regulations. Series A Tokens could be issued only in the US to specific targeted investors who do not need an immediate liquid market and would be happy to hold onto the tokens, while Series B Tokens could be issued in another jurisdiction with favourable token issuance regulations towards non-US investors.

Series A Tokens could be issued privately in the US by way of an STO to a select few investors through Regulation D Rule 506(c). In such a private US issuance,



**US\$ 11+bn**

raised via ICOs in 2018 globally



**...maybe there needs to be a new way of funding mining projects...**

Jean-Sébastien Jacques, Rio Tinto CEO, October 2018

there is no limit on the amount of money that can be raised. It also allows the company to access a larger pool of investors via general solicitation. In addition, the filing process is relatively light. One limitation of this structure is that it's only open to accredited investors—investors earning above US\$200,000 or with a net worth above US\$1 million. The other one is that such securities would also be “restricted securities”—the investors would only be able to resell the security tokens into the market by using an effective registration statement under the Securities Act or a valid exemption from registration for the resale, such as via so-called Rule 144.

Series B Tokens could be issued to non-US investors in reliance on US Regulation S through an STO. Series B Tokens can be potentially listed on an exchange in a non-US “token friendly” jurisdiction, where such an issuance may allow for quick secondary market liquidity. Under US Regulation S, there is also no limit on the amount of money that can be raised, and general solicitation is allowed as long as it does not target any US investors. The cons are that Series B Tokens have resale restrictions on them with respect to US investors.

The royalty token offering gives greater control to the mining company in raising royalty-linked capital and potentially diversifies the sources of royalty finance away from the select group of listed royalty companies and specialist funds that have traditionally dominated this realm of mining finance.

### All hype and speculation?

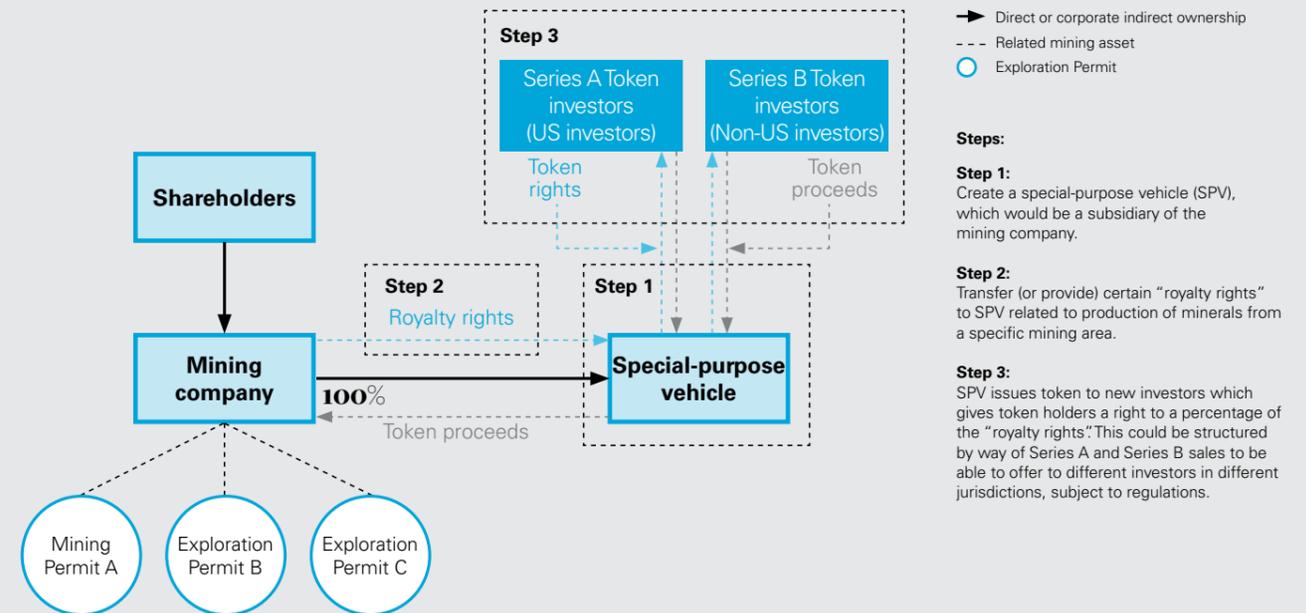
The recent rise of blockchain-powered digital financing tools in the form of ICOs created considerable hype and fuelled significant speculation. Some ICO scams tarnished the reputation of the underlying technology underpinning these digital financing tools.

However, blockchain and the digital financing tools built on it are showing signs of a paradigm shift from speculation to application. We are entering a phase in which there is a realisation that unregulated—and in certain cases—speculative ICOs without any economic rationale may not be best suited to succeed as a widely adopted digital financing structure, especially by traditional investors. Rather, digital financing structures, such as STOs compliant with regulation and structured with a sound economic purpose, are more likely to succeed.

Recent tokenisation of real-world assets by Elevated Returns—a financial group focused on digitising traditional financial assets—through an US\$18 million STO is a sign that regulated blockchain-powered digital financing tools will be embraced to raise capital by financing “real-world assets” and not only to raise capital for technological innovations, such as funding the development of source code.

Tokenisation will also come to the mining & metals industry. Traditional mining royalty financings, wrapped in an STO, are likely the first blockchain-based digital financing structures that will be widely applied in the mining & metals industry.

# STO structuring example: Revenue-linked royalty token



- ➔ Direct or corporate indirect ownership
  - Related mining asset
  - Exploration Permit
- Steps:**
- Step 1:** Create a special-purpose vehicle (SPV), which would be a subsidiary of the mining company.
- Step 2:** Transfer (or provide) certain “royalty rights” to SPV related to production of minerals from a specific mining area.
- Step 3:** SPV issues token to new investors which gives token holders a right to a percentage of the “royalty rights”. This could be structured by way of Series A and Series B sales to be able to offer to different investors in different jurisdictions, subject to regulations.

Pros	Cons
<ul style="list-style-type: none"> <li>□ Greater benefits for STOs generally</li> <li>□ Special purpose vehicle (SPV) bankruptcy remoteness</li> <li>□ Off-balance-sheet financing</li> <li>□ SPV domicile flexibility</li> <li>□ Potentially investor-friendly SPV governance</li> <li>□ Clear marketability/story</li> </ul>	<ul style="list-style-type: none"> <li>□ Requires a transfer of some rights to investors</li> <li>□ Mining royalty token is “new technology” and relatively untested</li> </ul>

Questions
<ul style="list-style-type: none"> <li>□ Who will diligence/value the mining royalty token of the issuer? Traditionally the realm of specialist royalty companies who typically grant royalties. Should be addressed via expert diligence and adequate disclosure in the investment documentation (arguably little or no difference to IPOing a single royalty)</li> <li>□ What if the issuer grants security over the mining royalty token (for example, an assignment by way of security of the contract granting rights to investors)—will it work? This would be uncharted territory and “untested,” but likely yes if structured properly</li> </ul>

High-level comparison of funding sources			
	Equity	Traditional private mining royalty	Mining royalty token (STO)
<b>Monetised asset</b>	Entire company	Royalty stream	Royalty stream
<b>Investment return</b>	Equity return	Depends on royalty; revenue-based (NSR, ORR, GR or FH) or profit-based (NPI or NRI)	Depends on royalty; revenue-based (NSR, ORR, GR or FH) or profit-based (NPI or NRI)
<b>Regulatory framework</b>	Contract and stock exchange/securities rules	Contract	“Smart contract”/exchange/securities rules
<b>Investor protection</b>	High	Medium	Medium/High
<b>Investor base</b>	Equity investor	Royalty company/fund (rarely syndicated)	Syndicated/diverse array of token investors
<b>Timetable</b>	Varies	Medium/Quick	Medium/Quick
<b>Effort</b>	High	Medium	Low/Medium
<b>Costs</b>	High	Medium	Low/Medium

# Roadmap to tokenising royalties in the mining & metals industry

## Initial planning

- 1 Identify underlying source of royalty
- 3 Identify all possible sources of capital for next financing round (including non-ICO/IEO/STO routes as well) and develop initial token structuring options
- 5 Prepare initial business financial and operating model
- 7 Diligence the royalty stream

## Token economics design

- 8 Appoint token advisers
- 10 Select which blockchain protocol (with smart contract functionality) should be used to facilitate the token launch: Ethereum, Tezos, etc.

## Detailed planning

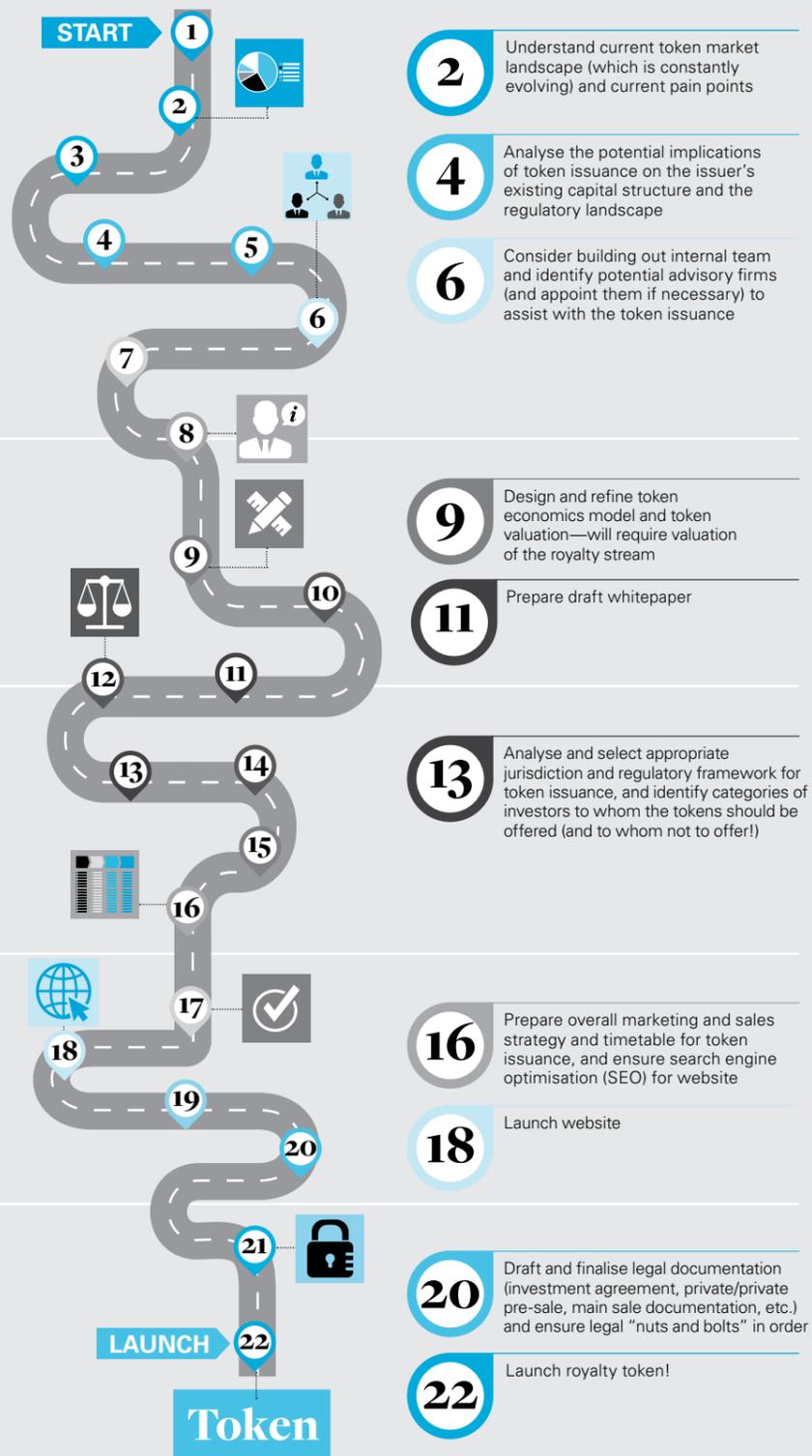
- 12 If not already done, appoint legal counsel, tax advisers and accounting firm
- 14 Analyse and structure token issuance so that it is consistent with relevant regulations and does not impact issuer's capital structure from a legal and tax perspective

## Marketing and sales

- 15 Appoint marketing company to help with marketing and sales strategy (cf with a broker who typically receives a commission on each sale)
- 17 Finalise whitepaper

## Token execution

- 19 Set up and finalise KYC and AML process and special-purpose vehicle (SPV) for token issuance
- 21 Audit smart contract code to ensure robust security, and that it accurately represents the terms contained in the whitepaper/other legal documentation



## Indicative timeline



## Practical tips

	<p><b>On which blockchain should mining companies consider issuing a security token?</b></p>	<p>There are many options, and this will ultimately depend on the issuer's preference and analysis of all available options. For example, Elevated Returns (which has a pipeline of real assets in excess of US\$1 billion targeted for these future token issuances) recently announced that it was switching from Ethereum to Tezos—a platform for smart contracts and decentralised applications—as the blockchain on which it will offer their fully compliant tokenised real-estate offerings to qualified investors. Elevated Returns will be working with the Tocqueville Group (TQ), an organisation that works with companies looking to build on Tezos.</p>
	<p><b>How should mining companies go about hiring developers to develop the "techy" aspects of a security token?</b></p>	<p>They could reach out to blockchain foundations and/or their partners. For example, the Tezos Foundation, which supports the Tezos blockchain platform, raised US\$232 million during a fundraiser in July 2017. The Tezos Foundation provides grants from the raised funds to companies/projects considering building on the Tezos platform and TQ provides them with assistance. "Representatives from both TQ and the Tezos Foundation are happy to have conversations with mining companies about how to go about this process...resources include support for technical integrations and training of in house technical teams...the Tezos Foundation may also be able to help provide financial support and other resources as well" says Alison Mangiero, President of TQ.</p>
	<p><b>Practical tips after the token launches?</b></p>	<p>Digital mining royalty token issuers and investors should consider taking advantage of new technological innovations that are coming to the mining industry. For example, MineHub—a company dedicated to realising the digital transformation of global mining &amp; metals supply chains—is developing a platform that will, among other things, orchestrate the coordination of physical delivery and settlement of transactions. This "would provide mining royalty issuers and investors/token holders with forecasted and realised volumes and revenues at a transaction level (in real time)...connecting a digital mining royalty token to the MineHub platform would further digitise the transaction and information flow process and provide for greater transparency for both issuers and investors" says Arnoud Star Busman, CEO of MineHub Technologies, Inc. (formerly Innovation Lead at ING).</p>

## A question of when, not if

The rise of digital financing structures will have profound implications for the mining & metals industry. Miners will be able to access alternative funding methods, which will be a welcome development, given the decline in equity funding into the sector. Industry players will now need to fully understand digital financing structures before engaging with miners who are raising such capital. For example, royalties and streams already give rise to unique inter-creditor considerations, as the interests of royalty and stream holders do not always sit comfortably with those of traditional senior creditors in an enforcement

scenario. The added STO wrapper may further give rise to potential complications that may be important to the various financiers, and any implications should be dealt with as early as possible in the financing. Similarly, M&A transactions involving a mining company with an existing tokenised royalty in its capital structure will involve a slightly different due diligence process, which is likely to involve a blockchain technical adviser.

Will digital financing structures based on blockchain technology disrupt the mining sector ecosystem? It may take some time for the traditional ecosystem to change, but it's a question of when, not if. ■



**The beauty of gold is that it's a solid asset. It's been around for a very long time and will continue to be around. The problem with cryptocurrencies is that the market is always changing and you constantly have to watch it.**

Randy Smallwood, CEO, SilverWheaton

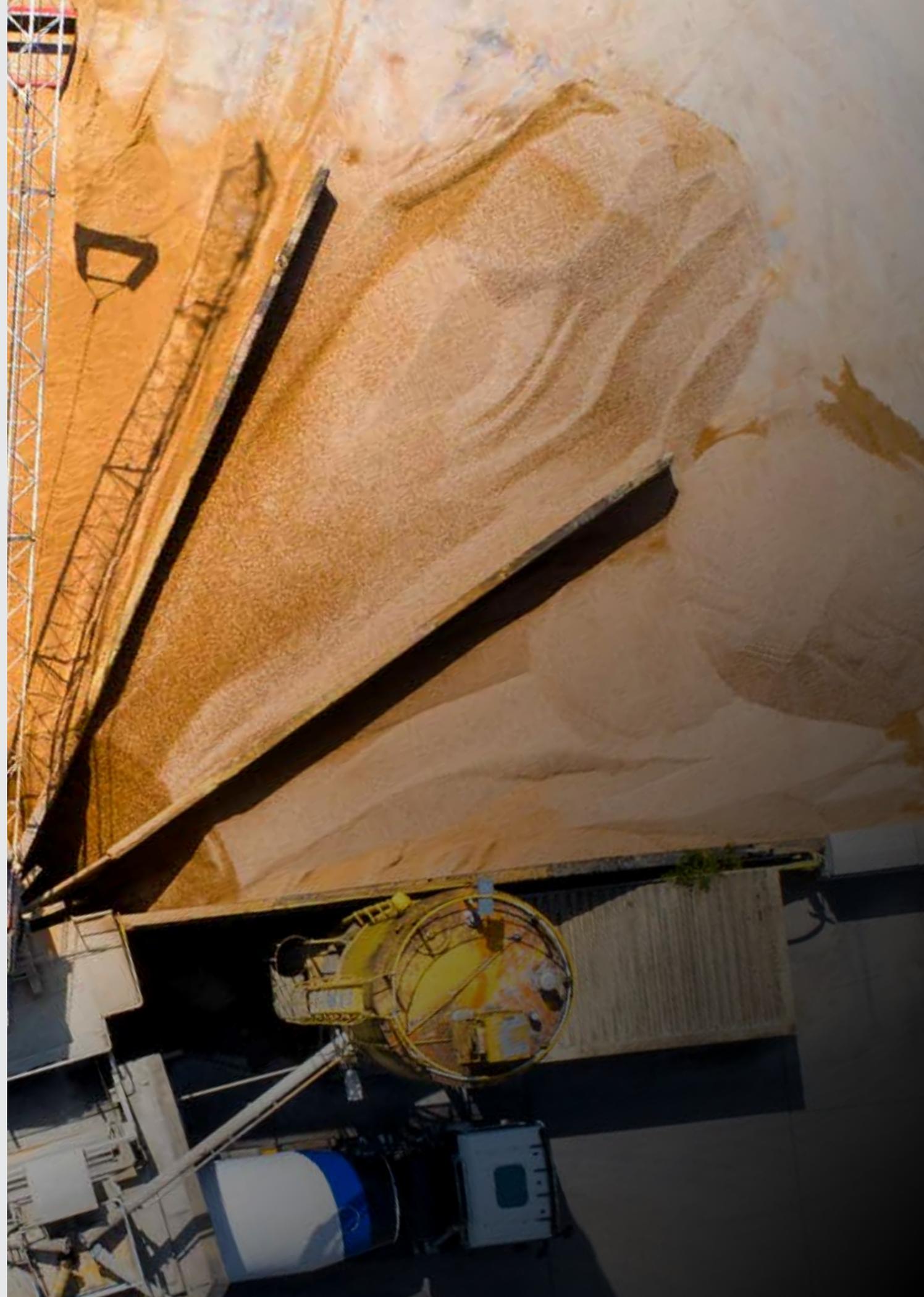
*However, imagine the powerful combination of solid mining assets underpinning tokens (cryptocurrencies)...*

## Excerpt from a sample smart contract code for a mining royalty token

The unaudited excerpt below is based on Solidity, a contract-oriented programming language for writing smart contracts. It is used for implementing smart contracts on various blockchain platforms, including Ethereum. Specific royalty features, such as the exact commercial content of the royalty stream, have not been included in this code. This fragment represents the simplest form of token that can be issued on the Ethereum network.

```
pragma solidity ^0.4.18;
contract ERC20Interface {
    function totalSupply() public constant returns (uint);
    function balanceOf(address tokenOwner) public constant returns (uint balance);
    function allowance(address tokenOwner, address spender) public constant returns (uint remaining);
}
contract MiningRoyaltyToken is ERC20Interface, Owned, SafeMath {
    string public symbol;
    string public name;
    uint8 public decimals;
    uint public _totalSupply;
    uint public startDate;
    uint public bonusEnds;
    uint public endDate;
    mapping(address => uint) balances;
    mapping(address => mapping(address => uint)) allowed;
    function MiningRoyaltyToken() public {
        symbol = "MRT";
        name = "MiningRoyalty Token";
        decimals = 18;
        bonusEnds = now + 1 weeks;
        endDate = now + 7 weeks;
    }
    function totalSupply() public constant returns (uint) {
        return _totalSupply - balances[address(0)];
    }
    function balanceOf(address tokenOwner) public constant returns (uint balance) {
        return balances[tokenOwner];
    }
}
```

Source: White & Case, GitHub



# WHITE & CASE

**Rebecca Campbell**

Partner, London

**T** +44 20 7532 2315

**E** rebecca.campbell@whitecase.com

**Andrzej Omietanski**

Associate, London

**T** +44 20 7532 1353

**E** aomietanski@whitecase.com

[whitecase.com](http://whitecase.com)

© 2019 White & Case LLP