

A bit of history...





FROM HERE TO INTEGRITY

Tackling technology and security for the gold supply chain

Neil Harby, MRSC CChem

IPMI European chapter - November 12, 2018

“Blockchain Will Completely Revolutionize How We Mine Gold And Precious Metals”

<https://www.forbes.com/sites/greatspeculations/2018/05/21/blockchain-will-completely-revolutionize-how-we-mine-gold-and-precious-metals/#1bbb39944fa1>

“Valcambi uses Emergent’s blockchain technology to further strengthen supply chain integrity”

<http://www.mining.com/web/valcambi-uses-emergents-blockchain-technology-strengthen-supply-chain-integrity/>

“Gold goes virtual on the blockchain”

<https://moneyweek.com/481705/gold-goes-virtual-on-the-blockchain/>

“DECENTRALIZING GOLD MINING USING BLOCKCHAIN”

<https://cryptocentral.io/decentralizing-gold-mining-using-blockchain/>

“US Company Wants to Track the Gold Supply Chain Using Blockchain Technology”

<https://nulltx.com/us-company-wants-to-track-the-gold-supply-chain-through-blockchain-technology/>

“IBM ties up with Asahi Refining and others on blockchain tech to track jewels from mine to store”

<https://www.japantimes.co.jp/news/2018/04/27/business/tech/ibm-ties-asahi-refining-others-blockchain-tech-track-jewels-mine-store/#.W450tuhKIUK>

BLOCKCHAIN

“World’s second largest gold mining company plans to trial blockchain technology”

<https://cryptoren.com/gold-mining-trial-blockchain-technology/>

“Blockchain to track Congo's cobalt from mine to mobile”

<https://uk.reuters.com/article/uk-mining-blockchain-cobalt/blockchain-to-track-congos-cobalt-from-mine-to-mobile-idUKKBN1FM0YI>

“World's Largest Mining Company to Use Blockchain for Supply Chain”

<https://www.coindesk.com/bhp-billiton-blockchain-mining-company-supply-chain/>

“Blockchain used to track gold and diamonds from mine to finger”

<https://www.businesslive.co.za/bd/business-and-economy/2018-04-30-blockchain-used-to-track-gold-and-diamonds-from-mine-to-finger/>

“Blockchain technology could prove beneficial to the mining industry – Fitch Solutions”

<http://www.miningweekly.com/article/blockchain-technology-could-prove-beneficial-to-the-mining-industry-fitch-solutions-2018-08-03>

“Yamana Gold utilises blockchain technology to monitor responsible gold supply chain”

<https://www.miningglobal.com/technology/yamana-gold-utilises-blockchain-technology-monitor-responsible-gold-supply-chain/>

“Be wary of man, woman attempting to sell fake gold near Olympia, deputies say”

<https://www.theolympian.com/news/local/crime/article215637360.html#storylink=cpy>

“Fake gold hits NYC”

<https://nypost.com/2012/09/23/fake-gold-hits-nyc/>

“Man accused of trying to sell fake gold bars”

<https://www.kfy.com/news/man-accused-of-trying-to-sell-fake-gold-bars/872651596>

““This Could Be Huge”: Gold Bar Certified By Royal Canadian Mint Exposed As Fake”

<https://www.zerohedge.com/news/2017-10-30/could-be-huge-gold-bar-certified-royal-canadian-mint-exposed-fake>

“Bullion buyers beware: Fake bars and coins hit the market”

<http://resourceclips.com/2017/11/01/bullion-buyers-beware-fake-bars-and-coins-hit-the-market/>

“San Jose woman, 75, loses \$12,000 in fake gold bar scam”

<https://www.mercurynews.com/2010/12/17/san-jose-woman-75-loses-12000-in-fake-gold-bar-scam/>

“The central bank of Ethiopia tried to sell fake gold bars worth millions”

<https://born2invest.com/articles/central-bank-ethiopia-fake-gold-bars/>

“Concerns About Counterfeit Gold Grow Louder”

<https://www.gainesvillecoins.com/blog/fake-gold-bars-fake-gold-eagles>

“45 fake gold bars seized, six men arrested”

<https://www.todayonline.com/singapore/45-fake-gold-bars-seized-six-more-arrested>

FRAUD

The image features three gold bars of varying sizes and orientations, set against a dark, textured background. One bar is positioned vertically on the left, another is horizontal in the foreground, and a third is horizontal and slightly elevated in the background. The lighting highlights the metallic sheen and texture of the bars.

The Global Authority for Precious Metals

Our mission is to ensure the highest levels of integrity, transparency and leadership for the global precious metals industry by setting standards and developing market services.

ROLE OF LBMA

Quality Control of the London Bullion Market



STANDARDS

Metal Quality
The Good Delivery System

Global Principles
Precious Metals Code



MARKET DEVELOPMENT

Regulatory Response
Global Value-chain Consultation
Statistics, Documentation
& Information
Increased Direct Participation &
Trading Flexibility



VOICE OF THE MARKET

Contacts with Regulators
and government agencies
Principal OTC Market
contact for media,
investors & public

LBMA GOOD DELIVERY LIST



Includes the world's pre-eminent refiners of gold and silver located in 31 countries



Annual production of 68 LBMA Gold Refiners
~85-90% of annual world gold production

The List is widely recognized as the de facto standard for the quality of gold and silver market bars and is used by **precious metal exchanges** around the world to define in whole or in part the refiners whose gold and silver bars are accepted in their own markets.



GDL & GOLD VAULTING

LBMA & Market Intersect



Nine recognised Custodians
Five clearers, three shippers & BoE



Eight vaulting companies



Security



Handling
Weighing, storing, packing, shipping



Quality monitoring
Gate keeper role



Almost all gold is held in the
form of Good Delivery bars

LBMA RESPONSIBLE SOURCING

Ensuring long term integrity of the wholesale precious metals market



GLOBAL RISK
ASSESSMENT



ENCOURAGES
ENGAGEMENT



TAILORED DUE
DILIGENCE FOR
ALL FEEDSTOCK

(mined gold, ASM gold
& recycled gold)



CONTINUOUSLY
MONITORED BY
INDEPENDENT
TEAM



EMPHASIS
ON PUBLIC
REPORTING

LBMA RESPONSIBLE SOURCING

From RGG to RSG to RPPG

- Environment, Sustainability and Governance issues [ESG]
 - Introduced 2018
 - Mandatory Audits due 2020
- Responsible Silver
 - Introduced 2017
 - Mandatory Audits due 2019
- Responsible Platinum and Palladium
 - Introduced 2018
 - Mandatory Audits due 2020

GOLD BAR INTEGRITY



This initiative builds on the LBMA's Responsible Sourcing programme and focuses on how blockchain can ensure supply chain provenance



In addition, it will also look at minimising the risks associated with fraud and breaches of security. Phase One will focus on kilobars & large bars



Technology to help mitigate the risk faced throughout the life cycle of the bar, and help to securely record bar specific data (i.e. brand, origin, custody, location) on a trusted platform

Technology to develop covert and overt security features to provide confidence in the bar being what it purports to be.



**Request for Proposal
to further strengthen
gold supply chain
integrity**

SUPPLY CHAIN PROVENANCE

Blockchain - RFP update I



Risks:

- Global Sanctions List
 - Anti-Bribery and Corruption
 - Human Rights
 - Conflicts Minerals
 - Anti-Money Laundering
 - Child Labour
-



RfP Questions:

- What can service providers offer;
 - How will the solution address the risks outlined;
 - Information on the company
-



Working Group:

- Upstream and Downstream
 - Focus Groups, dealing with specific issues (subset of WG)
 - Refiners group, independent from WG to manage conflicts.
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Next Steps:

- Develop standards that the blockchain solutions must meet
- Launch phase II of RfP to recognise who can meet the standards
- Focus Group to support the development –

GOLD BAR SECURITY FEATURE

RfP Update II



10-20 Criteria that set Specifications
More than one possible solution



Collaboration with
Vaults/Refiners/Exchanges and
Central Banks to ensure global
application



Continued monitoring of purity & fraud
issues reported by market



**Enhanced online
database of kilobar
drawings, photos and
serial numbers**



CRITERIA AND GUIDANCE FOR ANY TECH SOLUTION

To help with assessing credible solutions: high level

Chapter	Content
General Criteria and Standards for all	<ul style="list-style-type: none">• Usage and efficiency• Security requirements• Lifecycle• Compliance• Governance
Security Feature	<ul style="list-style-type: none">• Bar specification• Bar Handling
Supply Chain Provenance	<ul style="list-style-type: none">• Blockchain Technical requirements• Governance Model• Definitions / common ontology• Data Management

Must be scalable

Should not incur any additional customs or regulatory involvement

High security and protect against attacks (cyber security)

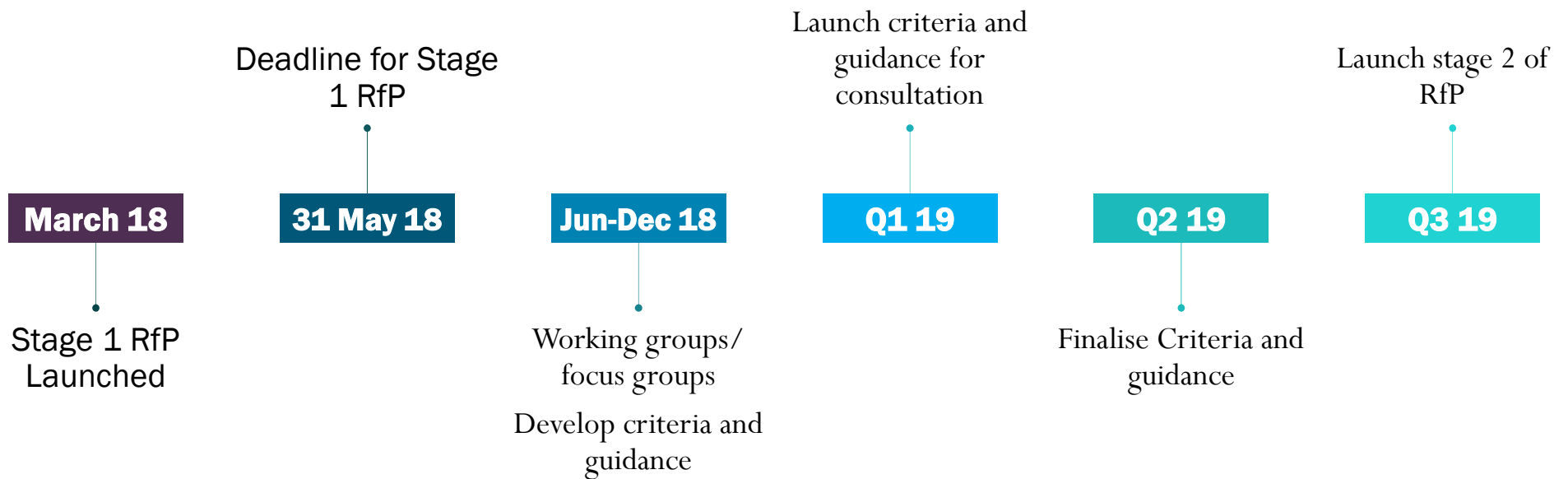
The market is very price sensitive and any costs should reflect this

Must not cause material damage to the bar or impact the assay

The entry and exit point controls should be addressed throughout the supply chain

Ownership details must be secure and only available to be controlled by the seller of the bars.

REQUEST FOR PROPOSAL - GOLD BAR INTEGRITY





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