



Connecting and Digitalising the
Precious Metal Industry

The Digital Solution for the Global Precious Metal Industry

Made by aXedras

May 2023

aXedras // Gold Traceability Workshop



Agenda for Today

- **Introduce aXedras**
- Showcase: Product traceability example from Mines to Refiner
- Q&A

aXedras in a Nutshell



Independent software provider connecting and digitalizing the precious metal industry



Founded in 2018 and headquartered in **Switzerland**



Independent software provider focusing on gold and precious metals



Distributed Ledger Technology / **Blockchain-based solutions** for connecting all stakeholders



Sound **precious metal market know-how & in-house programming capabilities**



Industry-aligned and tested solution by **LBMA** and **World Gold Council**



Seamless data exchange with Digital Twins across the value chain



The aXedras Platform provides a **data standard from supplier to end-investor** by creating a **digital twin of each physical metal product** (e.g., doré bars or refined products)

Physical Product



Digital Twin



Digital twin replaces
paper-based certificates /
documents

Digital Certificates



- ✓ **Product data** incl. on provenance & ESG
- ✓ **Efficiency gains** based on harmonized data standard
- ✓ Unique **Confidentiality** solution for product versus business transaction
- ✓ **Agnostic with Security Features**

We create Digital Twins & Make Link to Security Features Applied for Authenticity Check at all Stages of Product Lifecycle



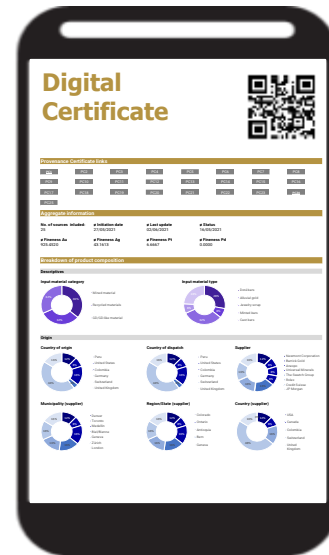
Digitalization of Product Attributes



Digital Twins



Link to Existing Security Features



Downstream:



Optical Security Feature



Digital Fingerprints

Upstream:



Geochemical Security Features

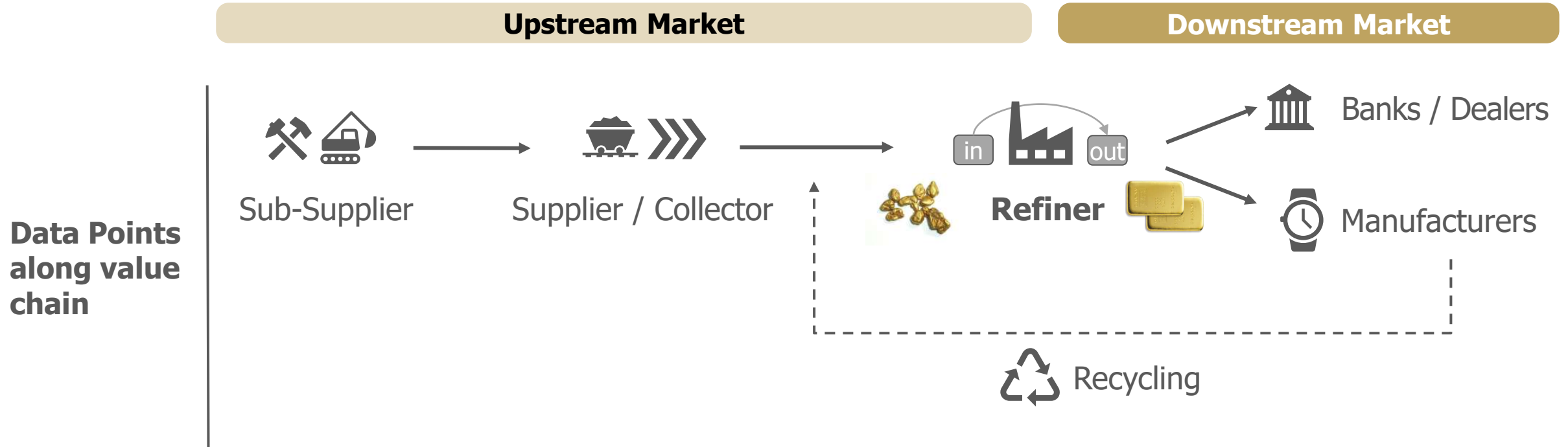


Optical / Physical Markers

Traceability of Mined and Recycled Material on One Data Platform



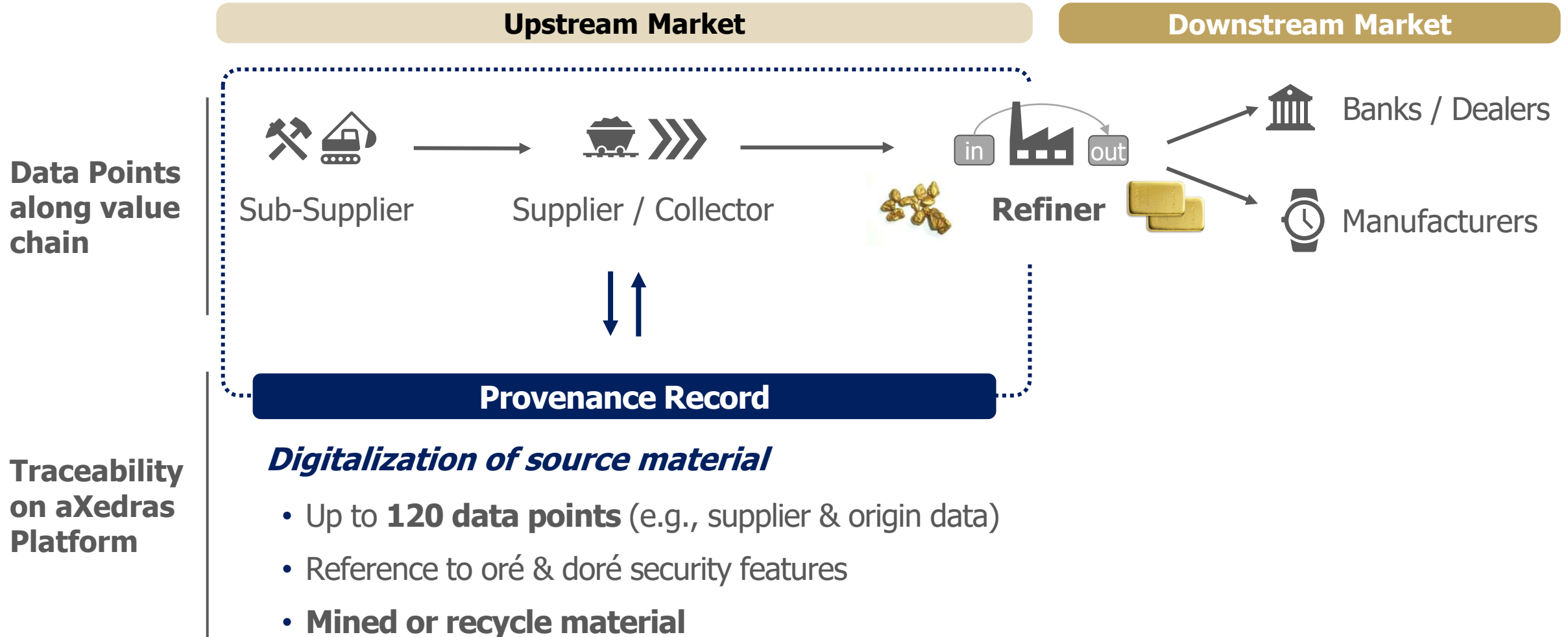
The digital twins on the aXedras platform enable the digitalization & documentation of physical material from its source to refiners to downstream customers



Traceability of Mined and Recycle Material on One Data Platform



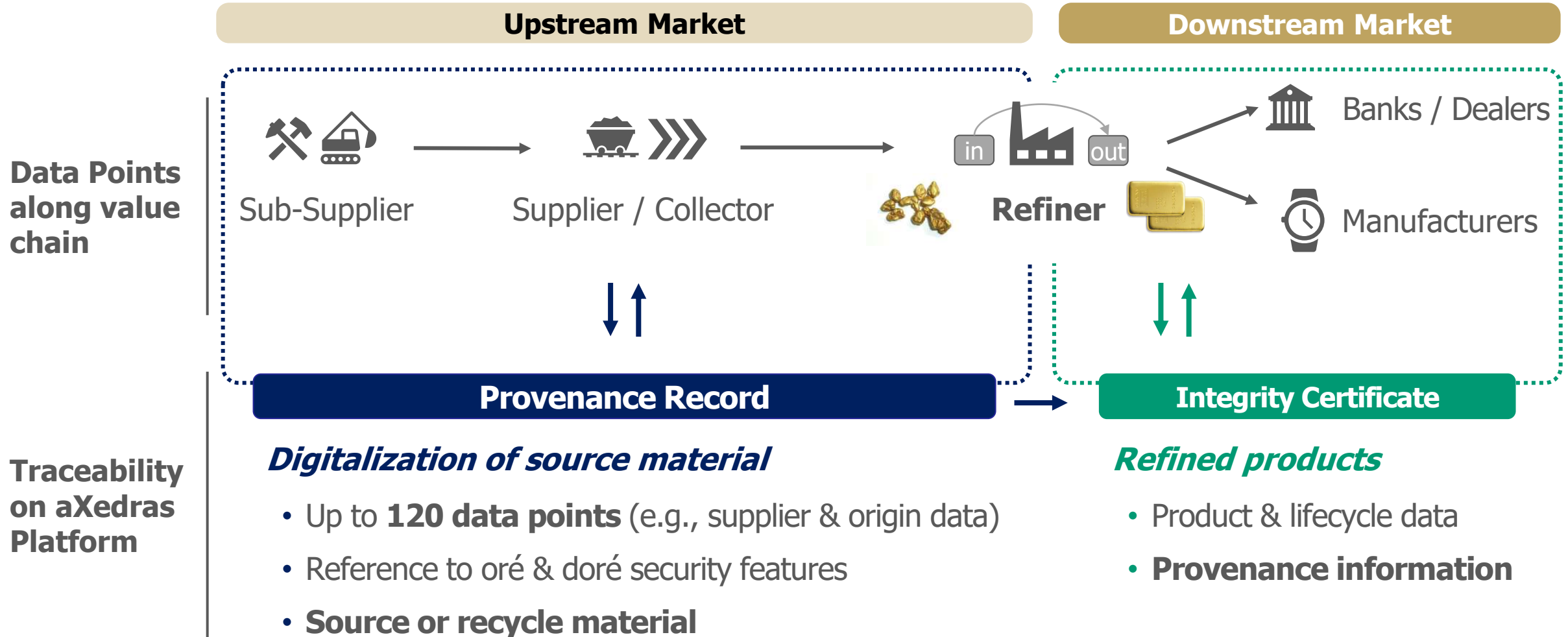
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Traceability of Mined and Recycled Material on One Data Platform



The digital twins on the aXedras platform enable the digitalization & documentation of physical material from its source to refiners to downstream customers





Agenda for Today

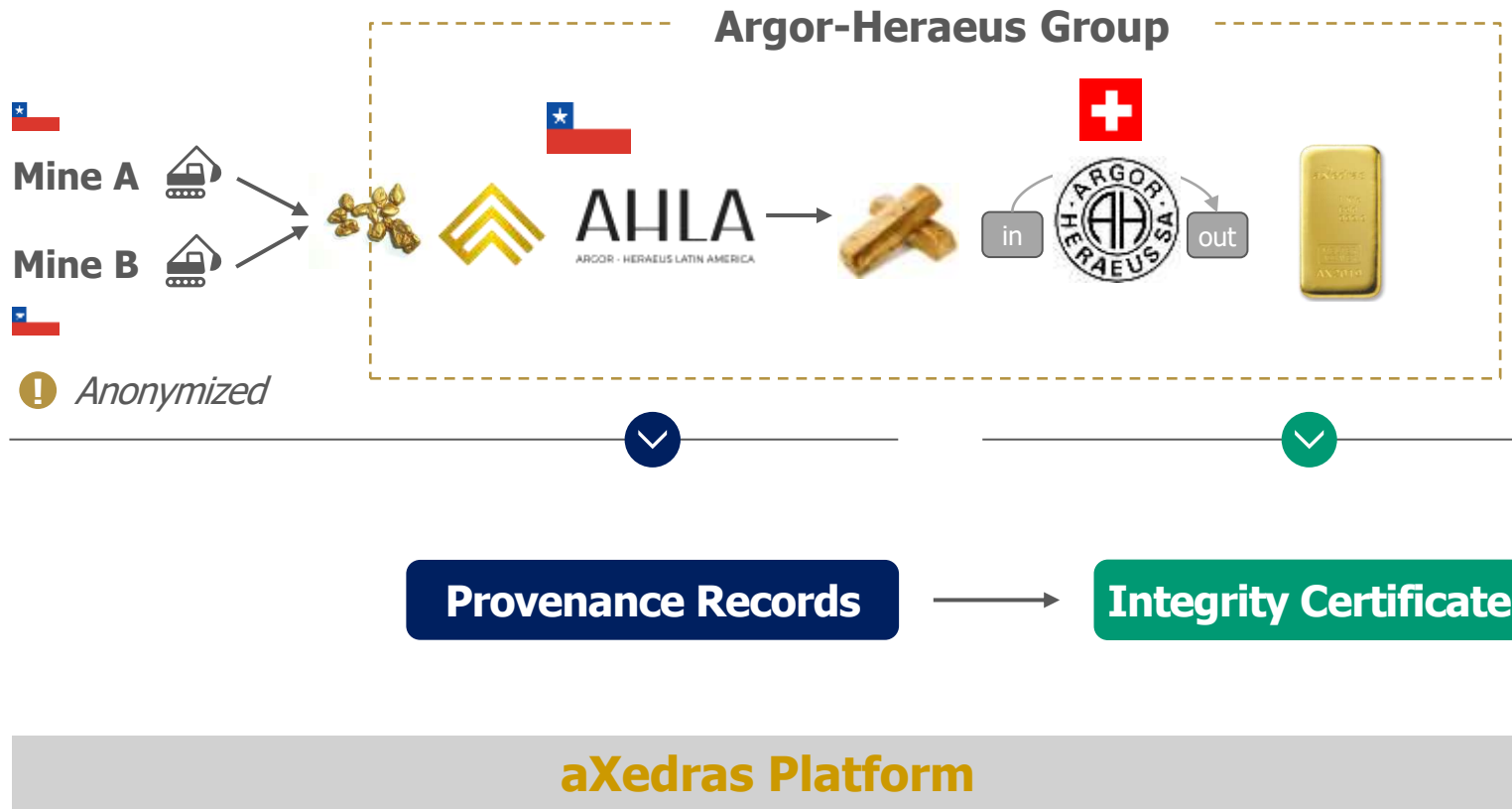
- Introduce aXedras
- **Showcase: Product traceability example from Mines to Refiner**
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Showcase: Traceability of Provenance Data from Chile within Argor-Heraeus Group



Digitalization of mined material

Linkage to refined products



Argor-Heraeus Latin America SpA

- Pioneer with aXedras in LATAM
- Digitalization of mined material through Provenance Records
- Cryptographically-secured data

Argor-Heraeus SA

- Receives the registered Provenance Records by Argor-Heraeus Latin America SpA
- Processes and links provenance data to its produced 1kg gold bars

Extract of Registered Provenance Record by Argor-Heraeus Latin America SpA

1 Transparency on source material & quality details

2 Disclosure of origin information

3 Upload of supplier / source material documents

axedras Admin Ayudras

Material information Goods receipt and assay results

Provenance record details PRMAG-1411A54179 Back

1. Fineness

Declared fineness	Unit	Declared fineness	Unit	Declared fineness	Unit	Declared fineness	Unit
46.55	ppm	942.88	ppm	0.00	ppm	0.00	ppm
Declared fine weig.	Unit	Declared fine weig.	Unit	Declared fine weig.	Unit	Declared fine weig.	Unit
[Redacted]	oz	[Redacted]	oz		oz		oz

2. Dates

Date of extraction	Registration date	Last update
[Redacted]	[Redacted]	[Redacted]

3. Descriptives

Net weight	Unit	Source material category *	Source material type *	Export customs tariff No.	Import customs tariff No.
[Redacted]	oz	Mixed material	Dark bars	7308.9102	
Corrected Net wt.	Unit	Corrected Source material category	Corrected Source material type		
		select	select		

4. Origin

Country of origin *	Country of registration *				
Chile, Americas	Chile, Americas				
Supplier *	Address *	Zip code *	Municipality *	Country *	Region/State *
Argor-Heraeus Latin America SpA	Patricia Vilaveta 555	3590484	Lampa	Chile, Americas	Region Metropolitana de S...
Mine name *	Mine location (municipality) *	Additional mine identifier	Mining capacity	Unit	
Mine A	Antofagasta	[Redacted]			

5. Additional product documentation

Document name	Document number	File limit	Uploaded file
Certificate of Origin		1	Guia N° 5482.pdf 519 kb
Chain of Custody		1	-
Statement of Conformance		1	
Invoice		1	FFD-1265 Proforma para Guia.pdf 108 kb



1 Transparency on Source material & Quality details

Provenance record details PRMAG-1411A54179

1. Fineness

Declared fine... 46.16	Unit ppt	Declared fine... 942.88	Unit ppt	Declared fine... 0.00	Unit ppt	Declared fine... 0.00	Unit ppt
Declared fine ... [REDACTED]	Unit... oz	Declared fine ... [REDACTED]	Unit... oz	Declared fine ... -	Unit... -	Declared fine ... -	Unit... -

2. Dates

Date of extraction ? yyyy.mm.dd	Registration date [REDACTED]	Last update [REDACTED]
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3. Descriptives

Net weight [REDACTED]	Unit oz ▼	Source material categor... Mined material ▼	Source material type * Doré bars ▼	Export customs tariff No. 7108.9102
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- > Data on Source Material from **Mine A (anonymized)**
- > Data on registered source material category & type (e.g., doré bars)
- > Additional descriptives such as fineness, weight or export customs tariff no.



2 Disclosure of Origin Information

Provenance record details PRMAG-1411A54179

4. Origin

Country of origin * ⓘ Chile, Americas	Country of registration * ⓘ Chile, Americas	
Supplier * Argor-Heraeus Latin America SpA	Address * Patricia Viñuela 335	
Zip code * 9390484	Municipality * Lampa	
Country * Chile, Americas	Region/State * Region Metropolitana de Santiago	
Mine name * Mine A	Mine location (municipality) * [REDACTED]	
Additional mine identifier [REDACTED]	Mining capacity 0.00	Unit -

- > **Country of origin disclosure**
- > Information on **supplier and mine** (incl. location)
- > Option to make reference to applied Upstream Security Feature



③ Upload of additional Supplier / Material Documents

Provenance record details PRMAG-1411A54179

5. Additional product documentation

Document name	Document number	Upload file *maximum file size 3 MB	File limit	Uploaded file
Certificate of Origin ⓘ		Drag and drop file or Browse	1	Guía N° 5487.pdf 519 kB
Chain of Custody ⓘ		Drag and drop file or Browse	1	-
Statement of Conformance ⓘ		Drag and drop file or Browse	1	-
Invoice	-	Drag and drop file or Browse	1	PPD-1265 Proforma para Gu

6. Compliance documentation

Licenses & certifications

Policies

> **Certificate of Origin document uploaded**

> Invoice document uploaded

> Option to add additional documents (e.g., licenses, certifications or policies)

Provenance Records Created by Argor-Heraeus Latin America SpA



- **Provide the basis for enabling traceability** of the refined gold product along the supply chain (identification on mine-level)
- **Full ownership of origin information** to foster transparency and accountability for responsible & sustainable mining practices
- **Product integrity** ensured as the registered data is immutable & cannot be manipulated by any other parties

Argor-Heraeus SA receives provenance data and can link it with the refined products

Data Linkage based on individual Confidentiality Policy

Outcome: Three Possible Layers of Data Integrity



Layer 1: Refined Product Information

Argor-Heraeus SA registered

Product Certificate
aXedras™ Code
ALIBGR- [REDACTED]

Metal Au	Brand ARGOR HERAEUS	Product No. [REDACTED]
Formal weight 1,000 g	Fineness 999.9	
Security Feature [REDACTED]	Production Registered Yes	
Date [REDACTED]		

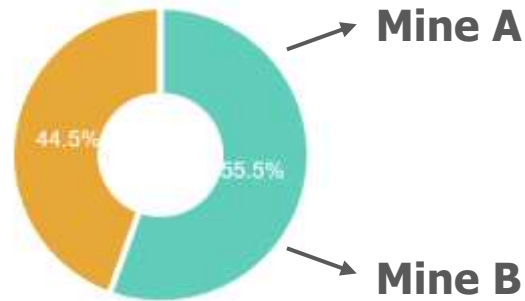
Security Feature Reference

Integrity Certificate



Layer 2: Breakdown of Product Composition

Based on production input



Layer 3: Specific Details per Mine

Argor-Heraeus LATAM registered

Provenance record details PRMAG-1411A54179

1. Descriptives

Source material categor... Mined material	Source material type * Doré bars
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2. Origin

Country of origin * Chile, Americas	Country of registrati... Chile, Americas
Mine name * Mine A	Mine location (municip... [REDACTED]

Provenance Record



② Layer 2: Product Composition Breakdown

The screenshot shows the aXedras interface for an Integrity Certificate. The main content area is titled '2. Source material components' and lists two source materials: 'Source material 1' (PRMAG-1411A54179) and 'Source material 2' (PRMAU-CEF72569E8). Below this is '3. Breakdown of products composition' with two donut charts: 'Country of origin' (Chile, Americas) and 'Mine name' (Mine A: 44.5%, Mine B: 55.5%).

> Overview of **Source Material Components**

> **Breakdown of products composition** along different data points:

- Source Material Category
- Origin Details
- Mine Details

> Accessible for Argor-Heraeus SA's downstream customer



Wrap-Up:

Generic Benefits of aXedras Platform

- **Transparency & Verification**
Ability to trace the origin (mine-level) and movement of precious metals products throughout the supply chain
- **Product Integrity**
Neutral data platform with immutable data records and interoperable with data by security feature providers
- **Efficiency / Harmonized Data Standard**
Efficiency gains based on streamlined data exchange & processing across stakeholders

Thank you!



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