IRMA Initiative for Responsible Mining Assurance

IRMA Chain of Custody
Claims Procedure and Communications Policy

Version 1.0

October 2024

English

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Acknowledgements
IRMA would like to thank all those who provided comments and recommendations to the various draft versions of this document. We would like to expand our gratitude to all the members and partners of IRMA, including Indigenous rights' organizations, mining-affected community organizations and associations, national and international NGOs, labor organizations and unions, mining companies, downstream purchasers, finance organizations and banks, standard-setting organizations, industry associations, consultants and practitioners, and others. The full list of IRMA members and partners is available on our website.

Disclaimer
IRMA will update this document as needed, replacing the previous version. Printed copies are uncontrolled and for reference only. Please refer to the electronic copy on the IRMA website (https://responsiblemining.net) to ensure you are referring to the latest version. Although every effort has been made to verify the accuracy of translations, the English language version should be taken as the definitive version.

Version History

Version number	Publication date	Description of amendment
1.0	October 2024	First publication

This policy amends the umbrella IRMA Communications and Claims Policy regarding IRMA-audited materials. Claims and communications about mine achievement level that are focused on the site's performance are covered by the umbrella IRMA Communications and Claims Policy, not this CoC Claims Procedure and Communications Policy.

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Testing Phase

The launch of the Chain of Custody Standard and this accompanying Communications and Claims Policy will be followed by an active testing phase during which the IRMA Secretariat will engage with Members and stakeholders on content, implementation, and oversight of the requirements of the Standard and this Policy. After the testing phase this Policy will be reviewed and modified to account for insights gained during the testing phase. This Policy will also be periodically reviewed to account for implementation experience and identify where guidance and procedures can be improved.

Inquiries or feedback

IRMA welcomes feedback on this document. Please contact the IRMA Secretariat by email at: info@responsiblemining.net

Related IRMA Documents

- **IRMA Standard for Responsible Mining V1.0**
- **IRMA Standard V2.0 for Responsible Exploration and Development, Responsible Mining, and Responsible Mineral Processing**
- **IRMA CoC Standard**
- **IRMA CoC Assurance Manual**
- **IRMA Communications and Claims Policy v.2.0 – April 2023**

Available at https://responsiblemining.net/resources/

Legal Compliance

Entities and individuals that make IRMA-related claims are each responsible for legal compliance with applicable law, including applicable laws and regulations related to labelling, advertisement, and consumer protection, and antitrust laws (applicable laws and regulations relating to antitrust and competition), always. IRMA cannot accept liability for any violations of Applicable Law, or any infringement of third-party rights made by other organizations.

Acknowledgements

IRMA would like to thank all those who provided comments and recommendations on the various draft versions of this document. We would like to expand our gratitude to all the members and partners of IRMA, including Indigenous rights' organizations, mining-affected community organizations and associations, national and international NGOs, labor organizations and unions, mining companies, downstream purchasers, finance organizations and banks, standard-setting organizations, industry associations, consultants and practitioners, and others. The full list of IRMA members and partners is available on our website.

About IRMA

The Initiative for Responsible Mining Assurance (IRMA) is the answer to a global demand for more socially and environmentally responsible mineral value chains. IRMA offers true independent assessment against a comprehensive standard for all mined materials that provides 'one-stop coverage' of the full range of issues related to the impacts of industrial mines.

IRMA vision

We envision a world where the mining industry respects the human rights and aspirations of affected communities, provides safe, healthy, and supportive workplaces, minimizes harm to the environment, and leaves positive legacies.

IRMA equal governance model

How voting happens, who has a vote, and what weight a vote carries, is key in multi-stakeholder leadership. IRMA is a multi-stakeholder-led organization, meaning that it must be accountable to all.

IRMA's governance is equally shared by six 'houses' of stakeholder groups: civil society, communities, and organized labor, alongside the mining, purchasing, and finance sectors. What this means in practice is that IRMA has a decision-making process that strives for consensus, and where consensus cannot be achieved, we then vote. All houses have two representative Board members, all with equal voting powers. However, a motion to approve a decision cannot succeed if any house is fundamentally opposed. In those cases, discussions must continue so that a resolution may be found.

For more information on decision-making, see IRMA website.

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I. Introduction

Overview

As a third-party assurance program, IRMA has a clear responsibility to control all relevant IRMA-related claims to ensure they are both credible and accurate. The IRMA Chain of Custody (CoC) Standard was developed to provide the base-level requirements for tracking of IRMA-audited materials, from the initial mine production through the supply chain to the end consumer. The term "IRMA-audited materials" refers to minerals and metals produced by mine sites that have completed an independent third-party audit against the IRMA Standard for Responsible Mining and been assigned an IRMA achievement level (IRMA Transparency, 50, 75, or 100).

The IRMA Mining and Mineral Processing Standard enables participating Entities producing metals and minerals to make claims with respect to their production of responsibly produced materials. The IRMA CoC Standard allows for tracking of those materials so that downstream users can make claims intended to differentiate a product, process, or business, as to their sourcing responsibly product materials. The IRMA CoC Registry is how materials are tracked. This IRMA CoC Standard Claims Procedure and Communications Policy describes the principles and rules for the IRMA CoC Registry which tracks inputs and outputs of IRMA-audited material and communication of claims for registered materials by IRMA-audited producing mines and downstream users of their products.

Given the incredible diversity of industries and supply chain activities involved in the IRMA value chain, there will be different forms of claims and differing relevance to various participants and their stakeholders. This document provides both principles and practical examples of how IRMA Members, non-Members, and other stakeholders may make claims. It is in the interests of all IRMA Members and supporting organizations to follow the rules regarding IRMA-related claims, and thus support the program's ongoing integrity and value.

The IRMA CoC Standard is for use by Entities producing, trading, processing, fabricating, or using IRMA-audited materials along the supply chain. To make official claims that are approved and assured by IRMA, Entities shall make those claims in accordance with this IRMA CoC Claims Procedure and Communications Policy. In addition, such Entities shall be independently assessed by an IRMA-accredited audit firm, in accordance with the IRMA CoC Assurance Manual.

The requirements of this document are normative with respect to their purpose, scope, effective date, notes on usage, references, terms, definitions, requirements, and annexes unless otherwise indicated.

The Complexity of Mineral Supply Chains

Unlike products like wood that maintain their fundamental identity throughout their supply chain, mined materials go through many physical changes that in most cases render them unidentifiable as the material sold by an IRMA-audited

mining operation. To the untrained eye, mined metal ore is indistinguishable from ordinary rock. And while some mines sell finished metal, or almost-finished metal, some sell ore to independent refiners/processors.

Complicating matters further, during the processing that makes these physical changes, other mined materials from numerous sources – non-IRMA-audited mines, recycled material, etc., – may be introduced such that is impossible to distinguish between the sources in a finished product. Further, other materials (e.g., molybdenum in the case of stainless steel) may be introduced during processing that may or may not be IRMA-audited.

Chain of Custody Models

In this document, the term "chain of custody models" is used to describe the approach taken to control inputs and outputs and associated information in a particular chain of custody system. To account for mineral supply chain complexity, the IRMA CoC Standard allows for five different chain of custody models. Each model has specific requirements that allow different claims to be made about materials or products that are delivered using that chain of custody model.

The five chain of custody models allowed by the IRMA CoC Standard are:

1. **Identity Preserved Model** - *chain of custody model* in which the materials or products originate from a sole source and their *IRMA Standard achievement levels* are maintained throughout the supply chain;
2. **Segregated Model** - *chain of custody model* in which *IRMA Standard achievement levels* of a material or product are maintained from the initial *input* to the final *output*;
3. **Controlled Blending Model** - *chain of custody model* in which materials or products with a set of *IRMA Standard achievement levels* are mixed according to certain criteria with materials or products without that set of characteristics resulting in a known proportion of the *IRMA Standard achievement levels* in the final output;
4. **Mass Balance Model** - *chain of custody model* in which materials or products with a set of *IRMA Standard achievement levels* are mixed according to defined criteria with materials or products without that set of characteristics.
5. **Book and Claim Credit Model** - *chain of custody model* in which the physical flow of material with a set of IRMA Standard achievement levels is not connected, but an administrative record of flow is maintained to ensure the quantity and achievement levels booked are not exceeded by the claims.

Entities using the mass balance model estimate (e.g., rolling average method) or allocate (e.g., mass balance free allocation method) the quantity of a particular physical output. Entities using the book and claim credit model cannot guarantee that a particular physical output, even when accompanied by the appropriate credit or certificate, contains items from an audited source or with the specific IRMA achievement level under which they were produced.

One of the basic purposes of the IRMA CoC Standard is to ensure that whichever chain of custody model or combination of chain of custody models is adopted, its integrity is safeguarded. An Entity chooses which chain of custody model to use depending on various factors regarding the quality and benefits the Entity intends to achieve, in addition to the nature of the processes and practices used in each step of the supply chain specific to each mineral commodity.

For a particular commodity it is possible that more than one chain of custody model may be used to describe different processes or procedures in the supply chain. As each chain of custody model represents a different level or amount of physical presence of the specified characteristic in the output, this document (**see Annex 1**) provides general guidance on the application of the defined chain of custody models, including initial guidance on the circumstances under which each chain of custody model might be appropriate.

II. Scope

The IRMA CoC Standard is applicable globally, without jurisdiction limit.

Entities solely conducting exploration and development of projects, and not actively in operation and production, are not subject to the IRMA CoC Standard.

The CoC Standard is implemented and audited at the individual site level. The scope includes all activities each site uses to purchase, receive, process, store, handle, sell, and ship IRMA-audited materials.

Eligibility

The CoC Standard applies to all Entities that desire to make assured claims for IRMA-audited materials.[1] This includes all Entities in the commodity supply chain of IRMA-audited materials that have legal ownership of those materials and sell, label, process, fabricate, manufacture or promote IRMA-audited materials as shown in Figure II.1. This includes:

1. Any mine site that produces an IRMA-audited mineral commodity, and wishes to make assured CoC claims.
2. Any site in the commodity chain that directly purchases IRMA-audited materials or that purchases a product containing IRMA-audited materials, and wishes to make assured CoC claims.
3. Any site or company in commodity chain that want to be able to purchase IRMA Credits.

Figure II.1. Eligibility for IRMA Mining Standard and IRMA CoC Standard

	Mine Site	Downstream Processor	Trader	Fabricator	Manufacturer	End-Brand
Eligible for the IRMA Mining Standard	✓					
Eligible for the IRMA CoC Standard	✓	✓	✓	✓	✓	✓

Entities producing IRMA-audited materials, if they wish to make downstream claims, must register their production, and claims as described in this Policy and in conformance with the IRMA CoC Standard. An assessment against the full IRMA CoC Standard is available to downstream processors including Entities that commonly mix production from multiple mine sites for secondary processing such as for smelting, refining, and chemical processing; and downstream users purchasing, trading, fabricating, manufacturing, or using IRMA-audited materials in end-brand products.
An IRMA CoC Standard Audit is not required for Entities providing services to IRMA CoC Standard audited Entities who do not take legal ownership of IRMA-audited materials. This includes:

[1] If a producing mine is selling all or part of their product to an Entity that does not wish to make an assurance claim, then the CoC does not apply to that portion of their production. For example, if a buyer wishes to remain anonymous, they can do so, but they cannot make an IRMA claim.

- Brokers, agents, and auction houses arranging the trade of IRMA-audited materials between seller and buyer.
- Providers of logistics services involved in transporting, temporary storage or warehousing where no change in composition or physical integrity of IRMA-audited materials occurs.

Commodity Specific Normative Guidance

As each metal or mineral commodity subject to the IRMA CoC Standard may have distinctive characteristics that affect its production and in turn the claims that may be allowed, normative guidance for mineral commodities that are being produced by IRMA-audited mines has been developed and is contained in **Annex 2**. The normative guidance presented is a work in progress and IRMA seeks feedback from members and others, particularly with respect to standard industry conversion and loss factors. [See Testing Phase prior to the Table of Contents]

Responsibilities

- IRMA is responsible for operating and updating the IRMA CoC Standard and audit system, for managing the IRMA CoC Registry, for approving and verifying claims, and for assigning IRMA CoC Audit Numbers.
- Entities seeking IRMA CoC Audits are responsible for ensuring their chain of custody system is in conformance with the IRMA CoC Standard.
- Entities making claims are responsible for submitting their production data to the IRMA CoC Registry and for submitting their claims for prior approval.
- IRMA-accredited Audit Firms are responsible for verifying whether an Entity's systems are in conformance with the IRMA CoC Standard and making a recommendation on conformance.

Effective and Validity Dates

Approval Date	September 2024
Publication Date	October 2024
Effective Date	Production from IRMA-audited mine site begins
Transition Period	September 2024 – February 2025
Period of validity	Until replaced or withdrawn

The transition period allows for IRMA-audited mines desiring to make claims for production prior to the public date of this CoC Standard.

III. IRMA CoC Registry Procedure

1. Scope

This procedure covers the requirements for the registration, transfer, and retirement of IRMA-audited materials units in the IRMA CoC Registry. The IRMA CoC Registry[2] relies on IRMA's robust third-party audit process and associated achievement levels, and it ensures that for each claim made based on the IRMA CoC Registry:

- Products with specific IRMA achievement levels in verifiable quantities have been produced;
- Product registrations, as well as their supply chains up to registration, are audited by an independent, third-party audit body (as specified in the IRMA CoC Standard Conformance Manual);
- Product transactions and retirements are fully traceable;
- Double-claiming of the benefits of those products is always avoided.

A Registry in the context of this document is an electronic data storage system that:

- Enables the registration, issuance, holding, transfer, and retirement of product units, and
- Performs the functions described in this document.

The units of tracking in the IRMA CoC Registry vary according to the commodity including its chemical composition. In most cases the units are metric tonnes and troy ounces. The units and chemical compositions most used are identified in the normative guidance for each commodity (**see Annex 2**).

Entities can open an account in the IRMA CoC Registry. There are two types of CoC Registry users:

1. CoC Registry users who produce IRMA-audited products that they wish to register in the IRMA CoC Registry.[3] These Entities must hold a valid IRMA Chain of Custody Certificate and be audited every three years and a surveillance audit conducted annually by an independent, third-party Audit Firm.

2. CoC Registry users who use/purchase the IRMA-audited products or transfer and/or retire credits registered in the IRMA CoC Registry **and intend to make IRMA related claims.**[4] These Entities must hold a valid IRMA Chain of Custody Audit and be regularly audited by an independent, third-party Audit Firm. These Entities are responsible for ensuring the requirements of

[2] IRMA will consider recognition of other claim registries in future versions of this document.

[3] Producers of IRMA-audited products may chose not to register all or part of their product, but downstream users of product that is not registered will not be able to make IRMA related claims. Claims for the quantity of material input to the IRMA CoC Registry must equal or be greater than claims for quantities made by downstream users.

[4] Input by users into the IRMA CoC Registry is not required by any entity in the material supply chain who does not wish to make a claim. Entity's making a claim are responsible for their CoC to establish and verify the preceding supply chain, and the Entity's CoC is subject to the *IRMA CoC Standard* and *IRMA CoC Conformance Protocols.*

the CoC Standard are upheld by intervening Entities such as purchasers, traders, downstream processors, and manufacturers.

2. General Requirements

2.1. Entities who wish to register, transfer, or retire IRMA-audited material units (AMUs) in the IRMA CoC Registry shall open an account by accepting the Terms and Conditions and fulfilling the requirements set by the administrator of such Registry, thus officially becoming IRMA CoC Registry System users.

2.2. System users may register, transfer, or retire IRMA AMUs only once the Registry operator has officially activated the account.

3. Registration Requirements

This section specifies requirements applicable to System users registering IRMA AMUs in the IRMA CoC Registry.

Product Eligibility and Audit

3.1. A batch of product is only eligible to be registered in the IRMA CoC Registry as an IRMA AMU if it is in conformance with the IRMA Mining Standard audit process.

3.2. Entities wishing to register IRMA AMUs must be a valid IRMA Member in good standing or an IRMA-audited mining operation.

3.3. System users who use/purchase the IRMA AMUs or transfer and/or retire AMUs registered in the IRMA CoC Registry, and intend to make IRMA related claims, must hold a valid IRMA Chain of Custody Audit, and be regularly audited by an independent, third-party Audit Firm.

3.4. Entities applying for CoC Audits may include more than one legal entity, i.e., trading office / subsidiary, in their audit scope. This can be done upon first application or anytime afterwards. Each legal entity must open its own individual account in the IRMA CoC Registry.

Product Registration

3.5. Only the amount of product from the IRMA audited site can be registered as IRMA AMUs.

3.6. IRMA AMUs shall be expressed in tonnes or ounces of the individual element (e.g., lithium rather than lithium oxide) produced unless otherwise specified in normative guidance.

3.7. The Entity shall have all necessary infrastructures (e.g. software or other tools) and operating procedures in place to effectively operate a Chain of Custody Tracking and Management System and ensure that IRMA-audited material can be tracked continuously without interruption through all processing and trading steps

taking place within the scope of the audit between the acquisition of the material and forwarding to clients. (Same as IRMA CoC Standard 4.1.1.)

3.8. The Entity's Chain of Custody Tracking and Management system shall document all sites where IRMA-audited material is acquired, managed, and forwarded and where internal processing steps occur, with additional requirements for site records as follows:

a) Mining including on-site mineral processing:
   - IRMA achievement level and chain of custody model employed;
   - List of all recipients of IRMA-audited material (e.g., downstream mineral processing, collection points, storage facilities, warehouse, traders), including their address and contracts;
   - Additional input material used by the Entity but provided by third parties;
   - Production records (quarterly);
   - Sales orders, sales invoices, dispatch information—including dates; customers to which the batch or lot was dispatched; delivery records;
   - Stock records, including inventory balancing, for storage sites;
   - Transporter or shipper details.

b) Downstream off-mine-site mineral processing and manufacturing:
   - List of all suppliers of IRMA-audited material, and copy of their valid IRMA achievement levels;
   - Purchase documents including, e.g., purchase orders, contracts, invoices and goods receipts inspections, delivery notes and received quantities;
   - Processing information including the conversion factors and specification of quantities of materials and products, stored and finished;
   - Production records;
   - Sales orders, sales invoices, dispatch information, including dates, customers to which the batch or lot was dispatched, delivery records;
   - Stock records including inventory balancing;
   - Transporter or shipper details;
   - Records of mass balance calculation (if relevant);
   - List of sites, status (in production/not in production);
   - Chain of custody model employed;
   - List of all recipients of IRMA-audited material (e.g. collection points,
   - storage facilities, warehouse, traders), including their address and contracts;
   - Additional sites used by the Entity but owned by third parties.

c) Storage Facilities, Warehouse and Traders
   - List of all suppliers of IRMA-audited material, and copy of their valid IRMA achievement levels;
   - Purchase documents including, e.g., purchase orders, contracts, invoices and goods receipts inspections, delivery notes and received quantities;
   - Sales orders, sales invoices, dispatch information, including dates, customers to which the batch or lot was dispatched, delivery records;

- Stock records including inventory balancing;
- Transporter or shipper details;
- List of all collection points, including name and address;
- Record of mass balance calculation (if relevant);
- If the Entity is not the legal owner of the storage site, a written contract between the Entity and the legal owner of the site will be required to forward products with an IRMA achievement claim included with the product information.
  (Same as IRMA CoC Standard 4.1.2.)

3.9. The System user may only register products that, at the time of registration, are in its Chain of Custody Tracking and Management Systems (i.e., mass balance system). No deficits of IRMA AMUs shall occur (i.e. the operator shall not register greater amounts of IRMA AMUs than acquired or produced).

3.10. The System user may merge batches of IRMA AMUs only if the characteristics match (e.g., have the same IRMA Achievement Levels).

3.11. The following documentation shall be submitted to register IRMA AMUs in the IRMA CoC Registry:

- Registration application via the Registry operator.
- Proof of product ownership, such as for example the Proof of Compliance (POC) from the supplier of the IRMA AMUs.
- Proof of Compliance (POC)

3.12. The Proof of Compliance (POC) shall contain the following information:

- Batch Information
  - Batch Number
  - Period of production
  - Date of Entry in the System user's Chain of Custody Tracking and Management Systems
  - Date and location of blending with other IRMA AMUs or non-IRMA material units

- Supplier information
  - Name, Address and System user code
  - Name and Address of Supplier(s)
  - Name and Address of the site from which the product is forwarded / dispatched
  - Chain of Custody Model Employed at Supplier's Most Recent Site

- Customer information
  - Declaration that POC is retired in the IRMA CoC Registry

3.13. Following the registration of IRMA AMUs in the IRMA CoC Registry, the System user shall withdraw the corresponding amount from its Chain of Custody Tracking and Management System. Documentation made available to the auditor for assessment could include contracts, invoices, or delivery information.

3.14. The System user shall record the acquired and forwarded IRMA AMUs in its

Chain of Custody Tracking and Management Systems, including compliance claims.

3.15. The Chain of Custody Tracking and Management System balance shall include the IRMA AMUs acquired and forwarded, as well as batches of material not intended for registration in the IRMA CoC Registry. The auditor shall have access to the complete documentation of acquired and forwarded product and product claims, including those traded with claims of certification systems other than the IRMA.

3.16. The System user shall monitor the balance of the IRMA AMUs withdrawn from and added to the Chain of Custody Tracking and Management System.

3.17. Whenever different chain of custody traceability methods are applied (e.g., mass balance and book and claim credit), the System user shall implement systems to avoid double counting, with documentation and the ability for system review at the time of audit.

3.18. The System user shall ensure deficits of IRMA AMUs do not occur (i.e., the operator shall not forward or deliver greater amounts of IRMA AMUs than is acquired or produced).

4. Requirements for IRMA AMU Transfer

This section specifies requirements applicable to System users for transferring IRMA AMUs in the IRMA CoC Registry. Some requirements below may become obsolete once the IRMA CoC Registry is fully automated.

4.1. The selling System user shall register the IRMA AMU transfer in the IRMA CoC Registry within 2 weeks from the transfer date.

4.2. System users shall only sell IRMA AMUs in the same form in which they were registered (i.e., with the same IRMA Achievement Levels).

4.3. The following documentation must be submitted to transfer IRMA AMUs in the IRMA registry:

- Transfer application via the Registry operator

4.4. The System user shall only transfer IRMA AMUs to other System users in the IRMA CoC Registry.

5. Requirements for IRMA AMU Retirement

5.1. The System user can only retire IRMA AMUs that are held in its account. System users cannot create a negative balance in the IRMA CoC Registry.

5.2. The following documentation must be submitted to retire IRMA AMUs in the IRMA registry:

- Retirement application via the IRMA CoC Registry operator

5.3. Different IRMA AMU batches (identified by the CoC Registry-assigned IRMA AMU ID) can only be merged into one retirement statement if their IRMA Achievement Levels match, as described in 3.8.

5.4. Upon the System user's retirement request, the IRMA CoC Registry shall issue a retirement statement, a sample of which can be found in **Annex 3**, containing the following information:

- Unique retirement statement number
- Date of issue
- Product type
- Amount of IRMA AMUs retired
- CoC Registry-assigned IRMA AMU ID
- Name of System user retiring the IRMA AMU
- If applicable, names of any additional Entities involved in the retirement (e.g., corporate end-user, freight forwarder)
- IRMA Achievement Levels linked to the retired IRMA AMU

5.5. Retirement statements shall be made publicly available by the IRMA CoC Registry to inform relevant public authorities and the general public.

5.6. Once retired, IRMA AMUs shall not be traded further downstream (i.e., sold to secondary markets).

6. Requirements related to Double Counting and Claiming

This section specifies the approach to mitigate the risk of double counting and claiming of IRMA AMUs. The IRMA Book and Claim Credit System integrates several measures to avoid double counting and claiming along the IRMA AMU value chain, which are explained below in Table III.6.1.

Table III.6.1 Risk Mitigation for Double Counting

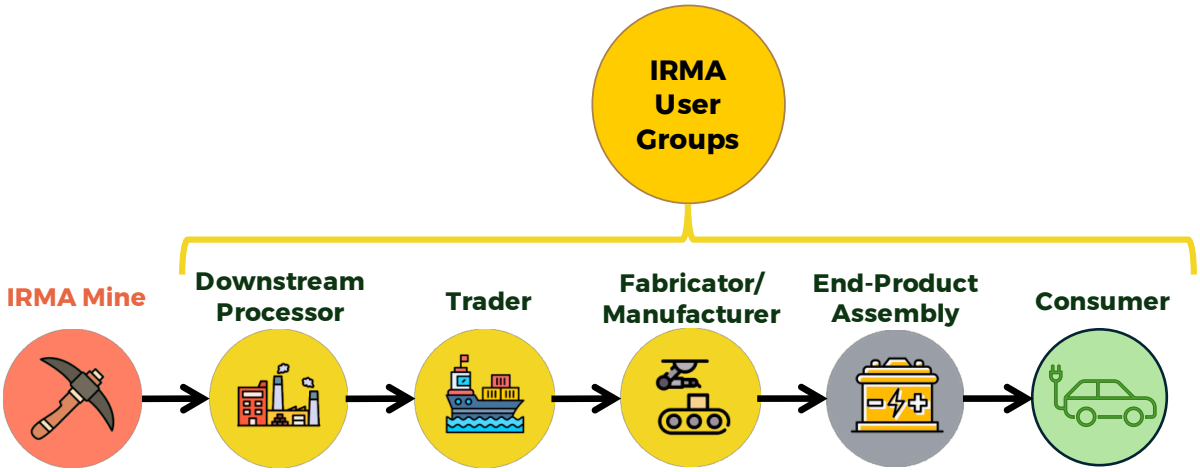
Type of Double Counting	*Risk Mitigation*
Double Issuance – More than 1 AMU issued for the same mine site production	• IRMA AMU registration by producers audited by third-party audit • IRMA CoC Registry Audit
Double Use – Same AMU used more than once (i.e., sold to more than one purchaser)	• Public Retirement Statement • IRMA CoC Registry Audit
Double Claiming – Two or more Entities claim ownership for the same AMUs.	• Public Retirement Statement

IV. IRMA CoC Claims Procedure

1. Scope

This procedure covers the requirements for logos and written claims made by IRMA CoC compliant Entities who source and produce IRMA-audited material and desire to make a claim for that material using the IRMA logo or identifying IRMA in written claims. As illustrated in Figure IV.1, this includes CoC claims for mine sites and for downstream user groups such as processors, traders, fabricators, and for end-product manufacturers to consumers. The claims are dependent on the CoC model being applied as identified in this procedure and further described in **Annex 1 – Chain of Custody Models**. This procedure provides examples of approved logos and general claims for user groups who source and produce IRMA-audited materials. Examples of approved claims for specific user groups relative to the CoC model are provided in **Annex 1**.

Figure IV.1.1 IRMA Mined Materials Supply Chain User Groups



Users of this procedure should take note of the following:

- Claims and communications about mine achievement level that are focused on the site's performance and not its produced material(s) CoC, and general communications regarding the IRMA CoC Standard, are covered by the umbrella IRMA Communications and Claims Policy[5], not this CoC Claims Procedure and Communications Policy.

- This Policy only addresses Chain of Custody claims referring directly to IRMA-audited materials. All IRMA-audited materials claims using "IRMA" or "Initiative for Responsible Mining" are subject to this policy. IRMA is not to be associated or inferred to be associated with any claims not including "IRMA" or "Initiative for Responsible Mining" or any language suggesting what it means to be IRMA-audited without prior approval (see Section IV.4).

[5] Available at https://responsiblemining.net/wp-content/uploads/2023/04/IRMA-Communications-and-Claims-Policy-v.2-20240412-FINAL.pdf

- This Policy does not address the use of IRMA in dual claims such as in association with any other standard. In general IRMA does not encourage the use of dual standards in claims. However, IRMA does not object to the separate identification of other standards provided they are not commingled in the same sentence with IRMA.[6]

- Use of the approved IRMA badges and written claim language provided in this procedure and in **Annex 1** does not need IRMA review before publication.do not need IRMA review (see Section 4.). If the claim language is modified, the claimant must submit it for review by IRMA prior to publication. Language that does not change the substantive contents can anticipate expedited review.

- All example claims end with an asterisk (*) corresponding to additional information as indicated for each claim. If not provided with the claim, the accompanying language may be provided via link to the IRMA website via QR code or URL. As this information indicates the specific characteristics of the material with respect to the CoC model being used it must be provided for all claims.

- Information contained within brackets in capital letters e.g., [MATERIAL] is intended to be replaced with the name of the actual produced material, mine site or user for which the claim is being made. For example, for a claim involving lithium, "[MATERIAL]" would be replaced in the sentence by "lithium."

2. IRMA CoC Standard Claims Language

If IRMA-audited mine sites or downstream Entities in conformance with the CoC Conformance Protocols desire to communicate about their compliance with the IRMA CoC Standard the following is an approved example claim:

> *This [MINE SITE or USER] is compliant with the IRMA Chain of Custody Standard. It has been independently verified against the IRMA Chain of Custody Standard by an accredited third-party audit firm.*

[6] For example, a claim that a product contains 75% IRMA-audited and 25% certified Recycled content is not allowed. However, the following would be allowed: This product contains 75% IRMA-audited material. It also contains 25% certified Recycled content.

3. IRMA User Group Claims Language

Because each CoC model represents various levels of physical presence, claim language must be specific to the CoC model being utilized prior in the supply chain and by each downstream user wishing to make an IRMA claim.

Therefore, the following sections provide approved example claims, for both company-level and on-product claims, specifically corresponding to the IRMA CoC models previously identified and as further discussed in **Annex 1 – IRMA CoC Models**.

3.1 Identity Preserved Model Claims

Characteristics: IRMA Origin 100% / Specific IRMA Achievement Level

Table IV.3.1 Approved Example Claim Language for Identity Preserved Model Claims

IRMA 100	*Company-Level: We source [MATERIAL] without mixing from the IRMA 100 audited [MINE SITE]** *On-Product: This product contains exclusively IRMA 100 audited [MATERIAL] sourced from the IRMA 100 audited [MINE SITE]**
IRMA 75	*Company-Level: We source [MATERIAL] without mixing from the IRMA 75 audited [MINE SITE]** *On-Product: This product contains exclusively IRMA 75 audited [MATERIAL] sourced from the [MINE SITE]**
IRMA 50	*Company-Level: We source [MATERIAL] without mixing from the IRMA 50 audited [MINE SITE]** *On-Product: This product contains exclusively IRMA 50 audited [MATERIAL] sourced from the [MINE SITE]**
IRMA Transparency	*Company-Level: We source [MATERIAL] without mixing from the IRMA Transparency audited [MINE SITE]** *On-Product: This product contains exclusively IRMA Transparency audited [MATERIAL] sourced from the [MINE SITE]**
IRMA Audited	*Company-Level: We source [MATERIAL] without mixing from the IRMA-audited [MINE SITE]** *On-Product: This product contains exclusively IRMA-audited [MATERIAL] sourced from the [MINE SITE]**
Generic claims	*Company-Level: We source [MATERIAL] without mixing from a mine audited against IRMA, the world's most comprehensive and rigorous standard** *On-Product: This product contains [MATERIAL] sourced exclusively from a mine audited against IRMA, the world's most comprehensive and rigorous standard**

The asterisk in the above claims indicates they must be accompanied either by the below language in full text, or a link or QR code pointing to the same language:

> **Originating from mines independently audited against the IRMA Standard. This chain of custody guarantees the absence of mixing with input material not sourced from an individual IRMA-audited mine site. This assured claim applies only to mine sites and does not guarantee the downstream conditions under which the material was processed, traded, transported, or manufactured.*

3.2 Segregated Model Claims

Characteristics: IRMA Origin 100% / Specific IRMA Achievement Level

Table IV.3.2 Approved Example Claim Language for Segregated Model Claims

IRMA 100	*Company-Level: We source [MATERIAL] without mixing from the IRMA 100 audited [MINE SITES]** *On-Product: This product contains exclusively IRMA 100 audited [MATERIAL] sourced from the [MINE SITES]**
IRMA 75	*Company-Level: We source [MATERIAL] without mixing from the IRMA 75 audited [MINE SITES]** *On-Product: This product contains exclusively IRMA 75 audited [MATERIAL] sourced from the [MINE SITES]**
IRMA 50	*Company-Level: We source [MATERIAL] without mixing from the IRMA 50 audited [MINE SITES]** *On-Product: This product contains exclusively IRMA 50 audited [MATERIAL] sourced from the [MINE SITES]**
IRMA Transparency	*Company-Level: We source [MATERIAL] without mixing from the IRMA Transparency audited [MINE SITES]** *On-Product: This product contains exclusively IRMA Transparency audited [MATERIAL] sourced from the [MINE SITES]**
IRMA Audited	*Company-Level: We source [MATERIAL] without mixing from the IRMA-audited [MINE SITES]** *On-Product: This product contains exclusively IRMA-audited [MATERIAL] sourced from the [MINE SITES]**
Generic claims	*Company-Level: We source [MATERIAL] without mixing from mines audited against IRMA, the world's most comprehensive and rigorous standard** *On-Product: This product contains [MATERIAL] sourced exclusively from mines audited against IRMA, the world's most comprehensive and rigorous standard**

The asterisk in the above claims indicates they must be accompanied either by the below language in full text, or a link or QR code pointing to the same language:

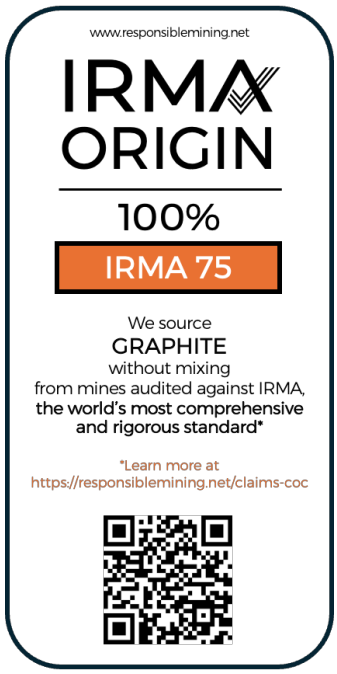
> * *Originating from mines independently audited against the IRMA Standard. This chain of custody guarantees the absence of mixing with input material not sourced from mine sites with the same IRMA achievement level. This assured claim applies only to mine sites and does not guarantee the downstream conditions under which the material was processed, traded, transported, or manufactured.*

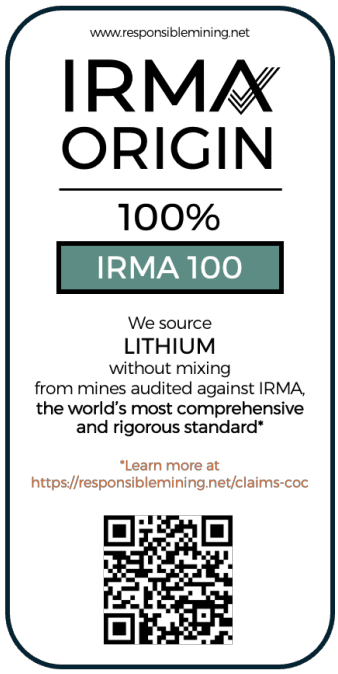
Mixing material from mines that have achieved different IRMA Achievement Levels: The "IRMA-audited" level claim for segregated material would allow for mixing of IRMA-audited material with different achievement levels provided the mixture is not mixed with input material from non-IRMA-audited mine sites. When different level IRMA-audited materials are mixed, the mixture adopts the lowest IRMA achievement level of its sources.

Badge Examples for Identity Preserved & Segregated Models

The examples below do not represent the comprehensive list of badges available.

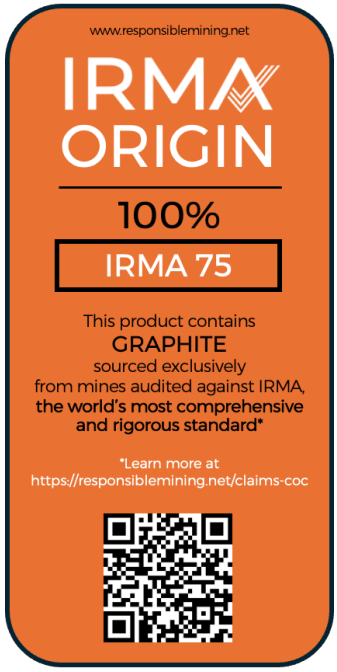
Company-Level (with Achievement Level)

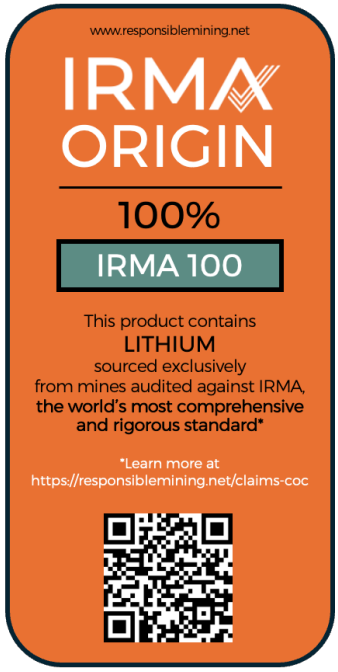




Company-Level (Generic claims only, without Achievement Level)

On-Product (with Achievement Level)





On-Product (Generic claims only, without Achievement Level)

3.3 Controlled-Blending Model Claims

Characteristics: IRMA Origin Mix / Specific IRMA Percentage and Achievement Level

Table IV.3.3 Approved Example Claim Language for Controlled Blending Model Claims

IRMA 100	*Company-Level: We source [%] [MATERIAL] from the IRMA 100 achieving [MINE SITES]** *On-Product: This product contains [%] IRMA 100 achieving [MATERIAL] sourced from the [MINE SITES]**
IRMA 75	*Company-Level: We source [%] [MATERIAL] from the IRMA 75 achieving [MINE SITES]** *On-Product: This product contains [%] IRMA 75 achieving [MATERIAL] sourced from the [MINE SITES]**
IRMA 50	*Company-Level: We source [%] [MATERIAL] from the IRMA 50 achieving [MINE SITES]** *On-Product: This product contains [%] IRMA 50 achieving [MATERIAL] sourced from the [MINE SITES]**
IRMA Transparency	*Company-Level: We source [%] [MATERIAL] from the IRMA Transparency achieving [MINE SITES]** *On-Product: This product contains [%] IRMA Transparency achieving [MATERIAL] sourced from the [MINE SITES]**
IRMA Audited	*Company-Level: We source [%] [MATERIAL] from the IRMA-audited [MINE SITES]** *On-Product: This product contains [%] IRMA-audited [MATERIAL] sourced from the [MINE SITES]**
Generic claims	*Company-Level: We source [MATERIAL] from mines audited against IRMA, the world's most comprehensive and rigorous standard** *On-Product: This product contains [MATERIAL] sourced from mines audited against IRMA, the world's most comprehensive and rigorous standard**

The asterisk in the above claims indicates they must be accompanied either by the below language, or a link or QR code pointing to the same language.

> ** Originating from mines independently audited against the IRMA Standard. This chain of custody guarantees a specific percentage of IRMA-audited material sourced from mine sites with the same IRMA achievement levels. This assured claim applies only to mine sites and does not guarantee the downstream conditions under which the material was processed, traded, transported, or manufactured.*

Mixing material from mines that have achieved different IRMA Achievement Levels: The "IRMA-audited" level claim for controlled blending would allow for mixing of IRMA-audited material with different achievement levels provided the mixture is combined with a fixed percentage of input material from non-IRMA-audited mine sites. When different level IRMA-audited materials are mixed, the mixture adopts the lowest IRMA achievement level of its sources.

3.4 Mass Balance Model Claims – Rolling Average Percentage Method

Characteristics: IRMA Origin Mix / Estimated IRMA Percentage and Achievement Level

Table IV.3.4 Approved Example Claim Language for Mass Balance Rolling Average Percentage Model

IRMA 100	*Company-Level: We source [MATERIAL] containing [%] [MATERIAL] from IRMA 100 achieving mines** *On-Product: This product contains [%] IRMA 100 achieving [MATERIAL]**
IRMA 75	*Company-Level: We source [MATERIAL] containing [%] [MATERIAL] from IRMA 75 achieving mines** *On-Product: This product contains [%] IRMA 75 achieving [MATERIAL]**
IRMA 50	*Company-Level: We source [MATERIAL] containing [%] [MATERIAL] from IRMA 50 achieving mines** *On-Product: This product contains [%] IRMA 50 achieving [MATERIAL]**
IRMA Transparency	*Company-Level: We source [MATERIAL] containing [%] [MATERIAL] from IRMA Transparency achieving mines** *On-Product: This product contains [%] IRMA Transparency achieving [MATERIAL]**
IRMA Audited	*Company-Level: We source [MATERIAL] containing [%] [MATERIAL] from IRMA-audited mines** *On-Product: This product contains [%] IRMA-audited [MATERIAL]**
Generic claims	*Company-Level: We source [MATERIAL] from mines audited against IRMA, the world's most comprehensive and rigorous standard** *On-Product: This product contains [MATERIAL] from mines audited against IRMA, the world's most comprehensive and rigorous standard**

The asterisk in the above claims indicates they must be accompanied either by the below language, or a link or QR code pointing to the same language.

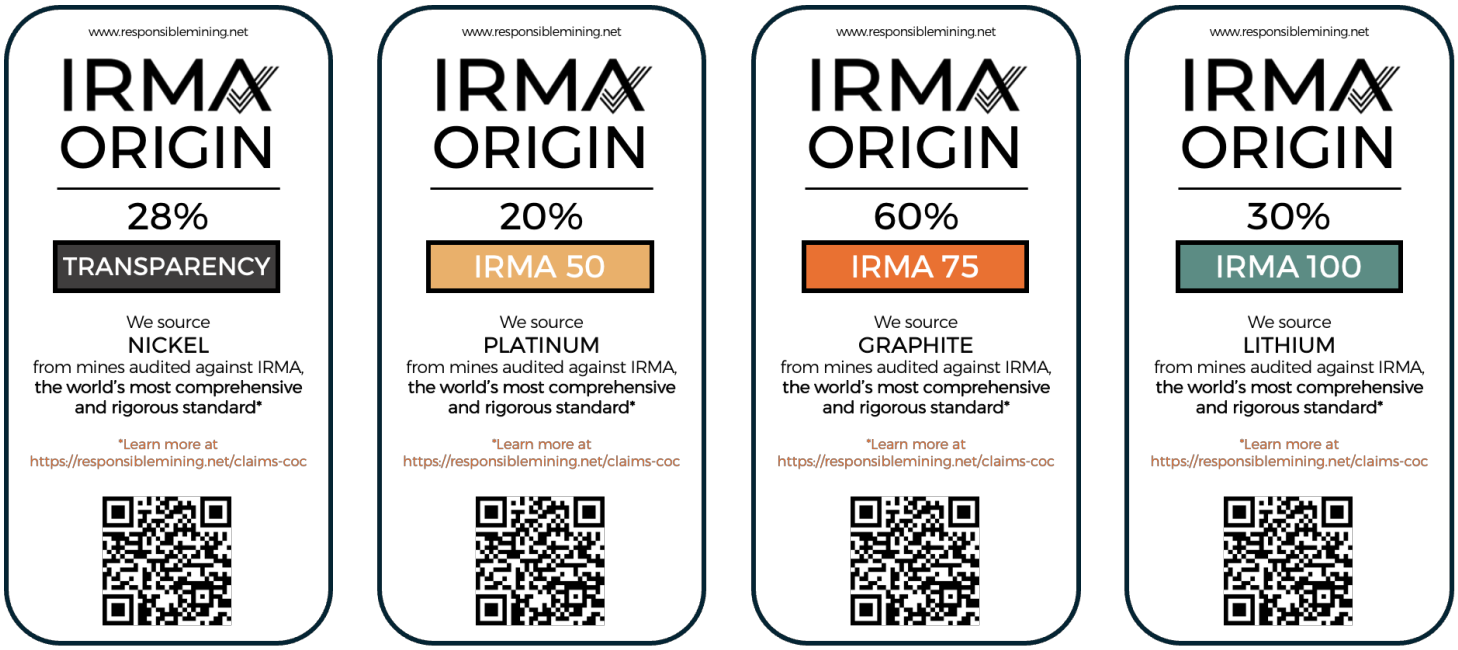
> ** Originating from mines independently audited against the IRMA Standard. This chain of custody is based on estimated average percentages of IRMA-audited material in a mixture with non-IRMA-audited material. This assured claim applies only to mine sites and does not guarantee the downstream conditions under which the material was processed, traded, transported, or manufactured.*

Mixing material from mines that have achieved different IRMA Achievement Levels: The "IRMA-audited" level claim for the mass balance model would allow for mixing of IRMA-audited material with different achievement levels. When different level IRMA-audited materials are mixed, the mixture adopts the lowest IRMA achievement level of its sources.

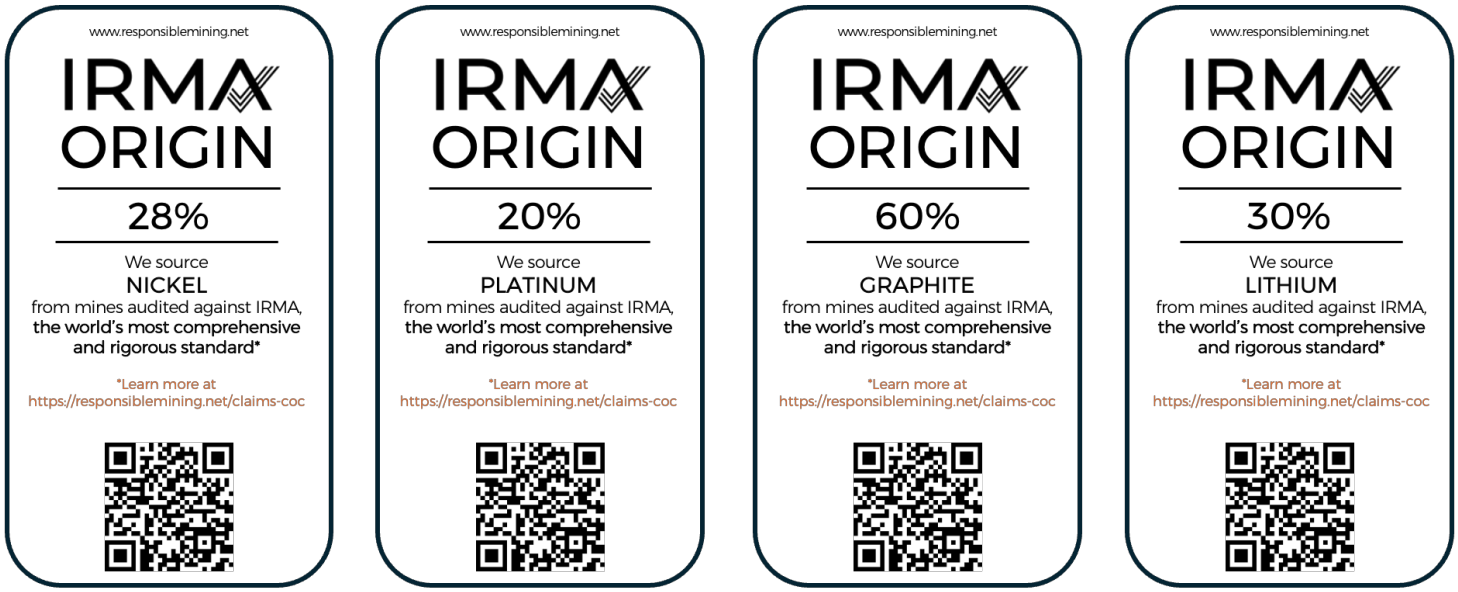
Badge Examples for Controlled Blending & Mass Balance Rolling Average Percentage Models

The examples below do not represent the comprehensive list of badges available.

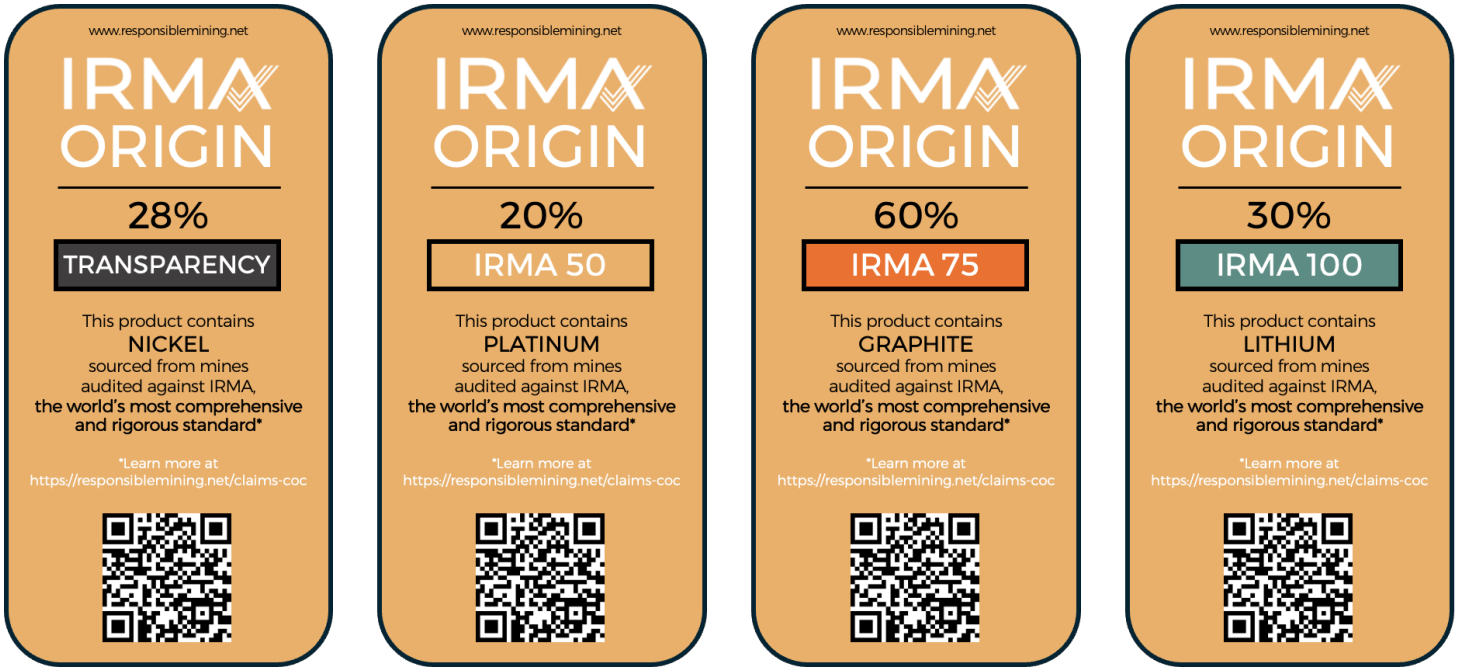
Company-Level (with Achievement Level)



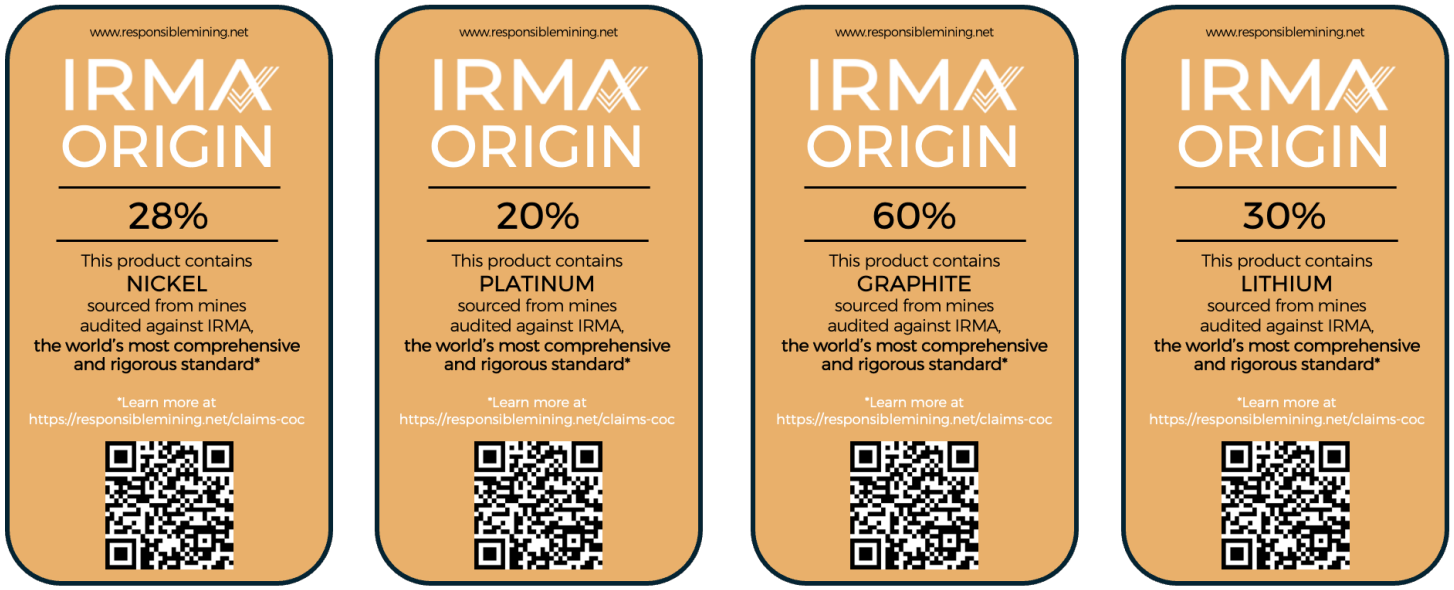
Company-Level (Generic claims only, without Achievement Level)



On-Product (with Achievement Level)



On-Product (Generic claims only, without Achievement Level)



3.5 Mass Balance Model Claims – Free Allocation Method

Characteristics: IRMA Origin Mix / Specific Achievement Level

Table IV.3.5 Approved Example Claim Language for Mass Balance Free Allocation Model

IRMA 100	*Company-Level: We source [MATERIAL] from IRMA 100 achieving mines** *On-Product: This product contains IRMA 100 achieving [MATERIAL]**
IRMA 75	*Company-Level: We source [MATERIAL] from IRMA 75 achieving mines** *On-Product: This product contains IRMA 75 achieving [MATERIAL]**
IRMA 50	*Company-Level: We source [MATERIAL] from IRMA 50 achieving mines** *On-Product: This product contains IRMA 50 achieving [MATERIAL]**
IRMA Transparency	*Company-Level: We source [MATERIAL] from IRMA Transparency achieving mines** *On-Product: This product contains IRMA Transparency achieving [MATERIAL]**
IRMA Audited	*Company-Level: We source [MATERIAL] from IRMA-audited mines** *On-Product: This product contains IRMA-audited [MATERIAL]**
Generic claims	*Company-Level: We source [MATERIAL] from mines audited against IRMA, the world's most comprehensive and rigorous standard** *On-Product: This product contains [MATERIAL] from mines audited against IRMA, the world's most comprehensive and rigorous standard**

The asterisk in the above claims indicates they must be accompanied either by the below language, or a link or QR code pointing to the same language.

> ** Originating from mines independently audited against the IRMA Standard. This chain of custody is based on estimated percentages and free allocation of IRMA-audited material in a mixture with non-IRMA-audited material. The IRMA Standard applies only to mine sites and does not guarantee the downstream conditions under which the material was processed, traded, transported, or manufactured.*

Mixing material from mines that have achieved different IRMA Achievement Levels: The "IRMA-audited" level claim for the mass balance model would allow for mixing of IRMA-audited material with different achievement levels. When different level IRMA-audited materials are mixed, the mixture adopts the lowest IRMA achievement level of its sources.

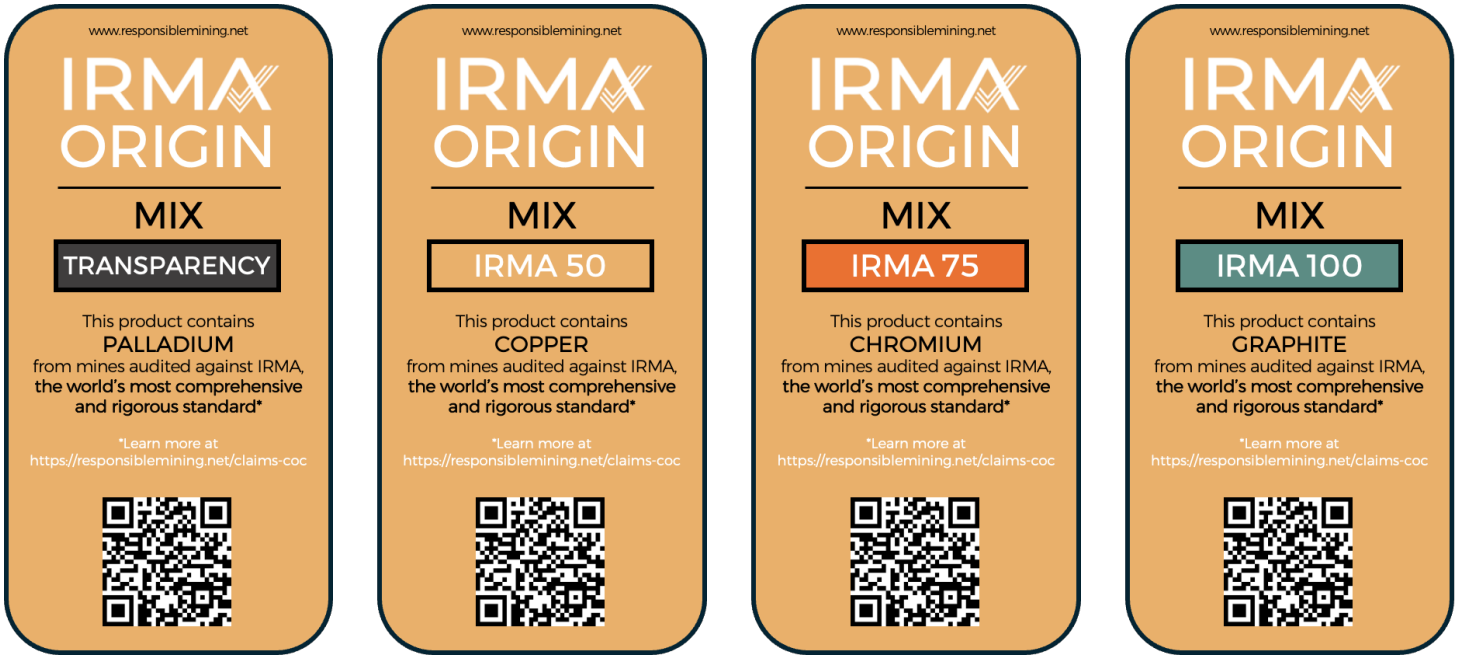
Badge Examples for Mass Balance Free Allocation Model

The examples below do not represent the comprehensive list of badges available.

Company-Level (with Achievement Level)

Company-Level (Generic claims only, without Achievement Level)

On-Product (with Achievement Level)



On-Product (Generic claims only, without Achievement Level)

3.6 Book and Claim Credit Model Claims

Characteristics: IRMA Credits / Specific Achievement Level

Table IV.3.6 Approved Example Claim Language for Book and Claim Credit Model

IRMA 100	*Company-Level: Our [MATERIAL] supports IRMA 100 achieving mines** *On-Product: This product supports IRMA 100 achieving mines producing [MATERIAL]**
IRMA 75	*Company-Level: Our [MATERIAL] supports IRMA 75 achieving mines** *On-Product: This product supports IRMA 75 achieving mines producing [MATERIAL]**
IRMA 50	*Company-Level: Our [MATERIAL] supports IRMA 50 achieving mines** *On-Product: This product supports IRMA 50 achieving mines producing [MATERIAL]**
IRMA Transparency	*Company-Level: Our [MATERIAL] supports IRMA Transparent achieving mines** *On-Product: This product supports IRMA Transparent achieving mines producing [MATERIAL]**
IRMA Audited	*Company-Level: Our [MATERIAL] supports IRMA-audited mines** *On-Product: This product supports IRMA-audited mines producing [MATERIAL]**
Generic claims	*Company-Level: We support the production of [MATERIAL] from mines audited against IRMA, the world's most comprehensive and rigorous standard** *On-Product: This product supports the production of [MATERIAL] from mines audited against IRMA, the world's most comprehensive and rigorous standard**

The asterisk in the above claims indicates they must be accompanied either by the below language, or a link or QR code pointing to the same language.

> ** Material originating from mines independently audited against the IRMA Standard. There is no physical flow of materials that can be verified. Total IRMA-audited credits from mine site sources cannot exceed the credits sold to downstream customers. The IRMA Standard applies only to mine sites and does not guarantee the downstream conditions under which the material was processed, traded, transported, or manufactured.*

Mixing material from mines that have achieved different IRMA Achievement Levels: The "IRMA-audited" level claim for the book and claim credit model would allow for mixing of IRMA-audited material credits with different achievement levels. When different level IRMA-audited materials are mixed, the mixture adopts the lowest IRMA achievement level of its sources.

Badge Examples for Book and Claim Credit Model

The examples below do not represent the comprehensive list of badges available.

Company-Level (with Achievement Level)

Company-Level (Generic claims only, without Achievement Level)

On-Product (with Achievement Level)

On-Product (Generic claims only, without Achievement Level)

4. Approvals for Claims

Entities seeking to make IRMA claims must ensure they meet the following requirements:

- A current IRMA Member or a mining company for the purpose of establishing CoC Claims for their IRMA-audited operations.
- Where applicable, have current IRMA audits and IRMA Chain of Custody Standard that includes the relevant production/Product within its Audit Scope.
- Entities must submit a description/visual of the proposed claim(s) to IRMA for advance review/approval via elemental or the form provided by IRMA (**See Annex 3**).

The following types of claims all require approval from IRMA to ensure consistency, clarity, and accuracy of such claims in connection with the relevant IRMA audits:

- Product Claims (for use of IRMA badges and/or written IRMA-related claims)
- Product-related claims where non-Members leverage On-product Claims from their CoC audited suppliers
- Claims related to sourcing IRMA-audited materials by Members and Entities without CoC Certification and non-Members.

IRMA has the right to decline, suspend or withdraw approval for use of its badges and/or related claims where there is a risk that it may be misleading or confusing or bring IRMA into disrepute. These decisions will be guided by IRMA's umbrella Communications and Claims Policy, Issues Resolution System, and Policy on Association.

Approvals Process for Claims

Step 1: Consult part 3 of this section and **Annex 1** to determine if the claim is appropriate for the Entity and Product CoC, and if you need it to be approved. (i.e. If the claim used only pre-approved language from this document, you don't need approval)

Step 2: Submit the claim approval request using the appropriate form (See example, **Annex 3 – Claim Approval Requests**). Members can seek approval on behalf of their clients/customers (non-Members) who will be leveraging Product Claims.

Step 3: IRMA aims to review the claim request and send the initial response within ten working days in most circumstances.

Step 4: If approved, the Member may proceed with the use of the claim. If not, the text and/or design will need to be adjusted and re-submitted. The re-submitted design will be reviewed within ten working days in most circumstances.

Step 5: For auditing purposes Members shall keep confirmation of the approved claim's request, supporting documentation, and volumes of CoC Material used with the claim in their records.

Claims content or designs must not be finalized or printed for commercial application until approval is granted by IRMA.

5. Monitoring and Enforcement

Monitoring Use of Claims

There are several means through which IRMA monitors the use of Trust Marks. The IRMA Secretariat:

- Reviews advance drafts of press releases which members, mines that have successfully completed an IRMA audit, and entities purchasing from (or investing in) IRMA-assessed mines are planning to issue to ensure that any claims are accurate prior to publishing the press release.
- Periodically monitors use of approved Trust Marks, e.g., prior to and following surveillance and 3-year re-assessment audits, prior to the annual renewal of membership, and annually for participants using the Mine Measure. Monitoring includes review of participants' websites and other online sources that mention both the participant and IRMA.
- May request information from a participant on where and how IRMA claims have been made and Trust Marks have been used.

IRMA requires Audit Firms to monitor the use of IRMA Trust Marks by its clients (mine sites) that undergo independent, third-party audits in the IRMA system. Audit Firms are required to notify the IRMA Secretariat within seven days of detecting any incorrect use of Trust Marks.5

Additionally, any stakeholder may file a complaint with IRMA against a member or other entity participating in the IRMA system (e.g., those using the IRMA self-assessment tool, mines (whether operated by a member or nonmember company) that have undergone independent, third-party assessment) alleging that the entity has made false, inaccurate or misleading claims related to the IRMA system or has inappropriately used an IRMA Trust Mark. Complaints related to claims will be addressed according to IRMA's Issues Resolution Procedures.

Responding to Identified Misuse by Members

When false, inaccurate, misleading or inappropriate use of IRMA Trust Marks—including visual representations such as logos, labels, and text-based claims—have been identified through monitoring, complaints or other means, the IRMA Secretariat will:

- Notify the IRMA participant of the breach of IRMA's Communications and Claims Policy, including details on the false, inaccurate, misleading, or inappropriate use of any Trust Marks
- Seek immediate corrective action(s) from the participant
- Verify the implementation of the corrective action(s)
- Document the breach and corrective actions sought and implemented

In cases where breach of the CoC Communications and Claims Policy is serious enough to create potential harm to the credibility or reputation of the IRMA system (e.g., the breach of claims is clearly deliberately fraudulent, a participant does not implement corrective actions in a timely manner, or a participant repeatedly violates the policy), IRMA reserves the right to cease its association with the participant (e.g., Membership could be revoked, certificates/levels of achievement canceled), or initiate probation pending corrective actions.

Responding to Identified Misuse by non-Members

Where the IRMA Secretariat becomes aware of any misuse of the IRMA claim badges and/or claims being made by non-Members, the IRMA Secretariat will:

- Notify the Entity of any identified false, misleading, or otherwise inappropriate claims.
- Seek immediate Corrective Action from the Entity, explaining IRMA's requirements.
- Track Corrective Action by the Entity and confirm outcomes.
- Log key steps in this process.

Where Corrective Action is not undertaken in a timely manner or is inadequate, the matter will be escalated. The IRMA Secretariat may seek legal advice, the result of which could include 'cease and desist' letters and/or legal action. IRMA will also publish information about misuse on the IRMA website and its social media accounts and inform Members and Stakeholders of the issue.

Annex 1 – Chain of Custody Models

The following sections further describe the five CoC models allowed by the IRMA CoC Standard:

1. **Identity Preserved Model**
2. **Segregated Model**
3. **Controlled Blending Model**
4. **Mass Balance Model**
5. **Book and Claim Credit Model**

The specific characteristics of each model are described together with specific aspects which must be followed to maintain the integrity of the model(s). In addition, each model is illustrated with figures that demonstrate how IRMA-audited materials flow through the supply chain and the corresponding claims. Importantly, they also indicate where a potential Point of Sale and/or Point of Claim (POS/C) may occur as shown by the following symbol:

For each POS/C an example of the corresponding material flow (inputs and outputs) is provided which would need to be identified in the chain of custody and provided to the IRMA CoC Register. Example claims are also provided based on the information contained in previous sections of this Policy. Additionally, examples based on existing and potential IRMA-audited materials are provided for each model to further illustrate the application of each CoC model.

Key Points for All IRMA Chain of Custody Models

- Entities producing IRMA-audited materials, if they wish to make downstream claims, are subject to registering their production and claims as described in this Policy.

- Entities may choose to register and sell only a portion of their production as IRMA-audited material but will not be allowed to make claims on any production of IRMA-audited material not registered.

- Different IRMA CoC models can be used at different points in the supply chain. However, the same CoC model as the supplier must be used, or a model with lower physical presence of the IRMA-audited material in the output must be used (e.g., if material is sourced from a mass balance model it cannot subsequently be claimed to have been produced from an integrated model by the purchaser when it is sold to the next Entity (see IRMA CoC Standard 1.1.3).

- If IRMA-audited material with a higher achievement level (e.g., IRMA 75) is mixed with material with a lower achievement level (e.g., IRMA 50) and the different contents are not identified in the product, then the mixture must be adjusted to the lower achievement level (e.g. IRMA 50 for the mixture).

- The material flows illustrated and provided as examples do not include production losses, conversions, or off-site fabrication which might result in the reduction to the quantity IRMA-audited registered material moving down the supply chain. This is further addressed in normative guidance for each material supply chain which is provided in Annex 2 of this document.

1. Identity Preserved CoC Model

The identity preserved chain of custody model allows for input that only originates from a sole source. In the identity preserved model, the material or product is kept physically separated and its characteristics are maintained throughout the supply chain. Materials or products are clearly identifiable throughout the supply chain as originating from a sole source.

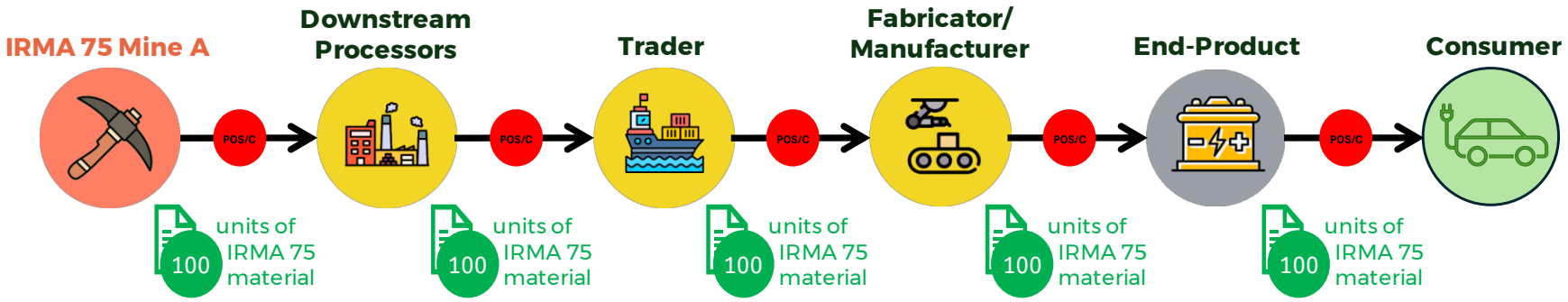
The identity preserved model ensures that the materials or products are 100% identifiable from the original source and therefore satisfies item-based expectations of organizations active in the chain of custody, consumers, or other end users. The identity preserved model is most applicable to situations where a mine/mineral processing facility's produced material's properties are retained, and further downstream processing is performed in dedicated batches or at dedicated facilities.

IRMA CoC Standard C.1 IRMA CoC Standard Requirements for Identify Preserved Model requires the following:

> *C.1.1. The Entity applying the identity preserved model shall ensure that the material or product with an IRMA achievement level is physically separated and clearly identifiable throughout all stages of the production and transportation and the trading process.* ***The Entity shall ensure that the material or product is clearly identifiable to a particular single source***.

A simplified illustration of the identity preserved model and supply chain as applied to IRMA-audited material is shown in Figure A.1.1. The figure shows an example where Mine A is an IRMA 75 achieving mine site that produces and records 100 units (e.g., ounces, kilograms, tonnes, etc.,.) of IRMA 75 achieving material in the IRMA CoC Registry. This also allows Mine A to sell the material with a mine site claim that it is IRMA 75 achieving material. As shown, the 100 units of registered IRMA 75 material from Mine A can then be transferred or sold to downstream user groups.

Figure A.1.1. IRMA Identity Preserved Model (adapted from ISO Std No. 22095:2020)



The Identity Preserved CoC Model is further illustrated in the following example.

Lithium Brine Mine Site Example

An IRMA 75 achieving lithium (Li) brine mine site inputs in the IRMA CoC 1,000 tonnes (metric tons) of lithium Li as elemental Li contained in a 6% li liquid concentrate. This allows the IRMA 75 achieving Li brine mine site to sell up to 1,000 tonnes of Li with the mine site claim they produced 1,000 tonnes of IRMA 75 achieving Li.

The 1,000 tonnes of the registered IRMA 75 Li from the IRMA 75 achieving mine site is then processed in a dedicated downstream facility. The same 1,000 tonnes of Li is then sold in turn to a downstream processor with dedicated facilities, which is then sold to fabricators/manufacturers who utilize only the same 1,000 tonnes of Li without mixing, and is finally assembled into end-products containing the same 1,000 tonnes of Li. If any of the users wish to maintain a claim the Li from the IRMA 75 achieving mine must not be mixed with any other source.

The supply chain for Li and most other commodities results in exponential distribution of the initial 1,000 tonnes. After distribution to different downstream users, if used for electric vehicles (EVs) with a battery containing on average 8 kilograms of lithium, the 1,000 tonnes of IRMA 75 achieving Li could be used to build 125,000 EVs. If used for cell phones containing on average 2 grams of lithium per battery, the 1,000 tonnes of IRMA 75 achieving Li could be used to build the batteries for 500,000,000 cell phones.

2. Segregated Model

The segregated model is a chain of custody model in which, from initial input to final output, the IRMA Standard achievement levels are maintained. Inputs from various sources may be mixed, based on identical characteristics. However, the identity of any sole source might be lost.

In the segregated model, materials or products with IRMA Standard achievement levels are kept physically separated and their characteristics are maintained throughout the supply chain. The inputs will have identical IRMA achievement levels but may have various sources.

The segregated model ensures that the materials or products are identifiable from the original sources of the same IRMA achievement level and therefore satisfies item-based expectations of organizations active in the chain of custody, consumers, or other end users. The segregated model is most applicable to situations where two or more mines or mineral processing facilities produce identical IRMA-audited level products whose materials properties are retained, and further downstream processing is performed for the combined materials in dedicated batches or at dedicated facilities.

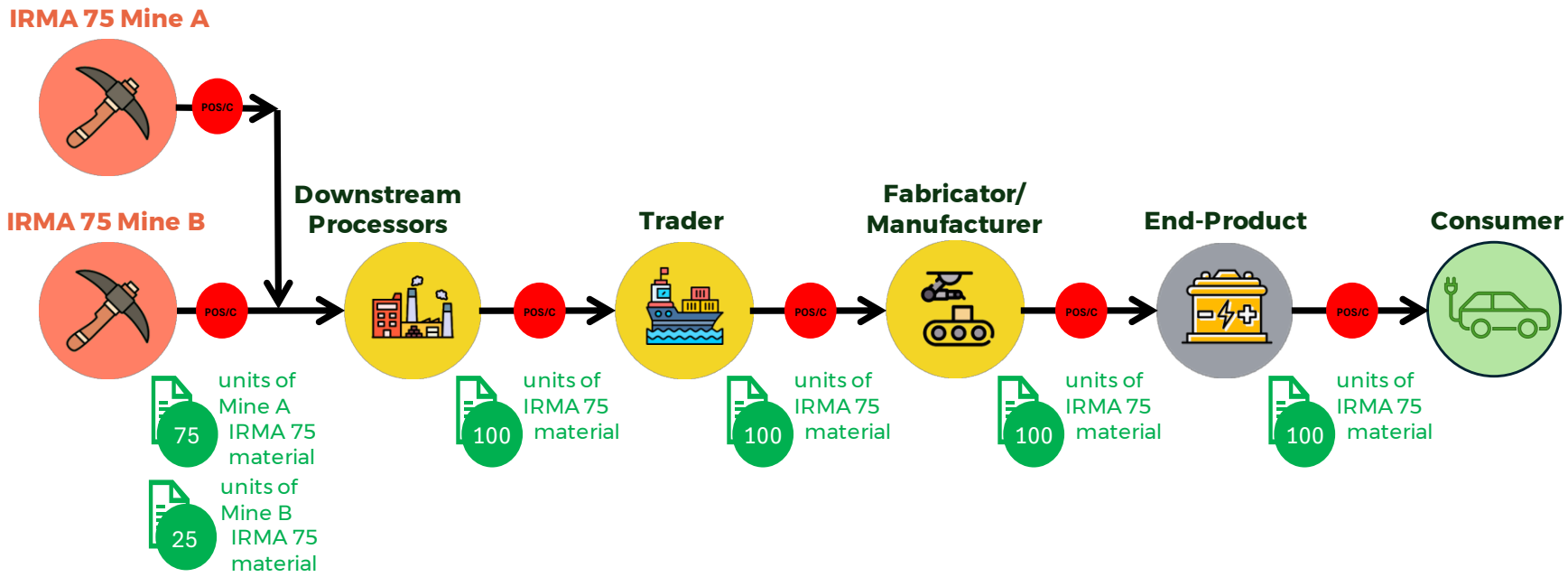
IRMA CoC Standard C.2 IRMA CoC Standard Requirements for Segregated Model requires the following:

> *C.2.1. The Entity applying the segregated model shall ensure that the material or product with IRMA achievement levels is physically separated and clearly identifiable throughout all stages of the production and the trading process. This shall be achieved by demonstrating:*
>
> *a) physical separation of inputs and outputs with IRMA achievement levels from any other inputs and outputs during all stages;*[7]
>
> *b) clear identification of the material or products during the process;*
>
> *c) the output quantities corresponding to the input quantities in line with an appropriate conversion factor.*

A simplified illustration of the segregated model and supply chain as applied to IRMA-audited material is shown in Figure A.2.1. The figure shows an example where Mine A is an IRMA 75 achieving mine site that produces and records 75 units (e.g., ounces, kilograms, tonnes, etc.,,) of IRMA 75 achieving material in the IRMA CoC Registry and Mine B produces and records 25 units of IRMA 75 achieving material in the IRMA CoC Registry. This also allows Mine A and Mine B to sell the material with a mine site claim that it is IRMA 75 achieving material.

[7] Ibid

Figure A.2.1. IRMA Segregated Model (adapted from ISO Std No. 22095:2020)



As shown, the 75 units of registered IRMA 75 material from Mine A can be mixed with the 25 units of registered IRMA 75 material from Mine B and then be transferred or sold as 100 units of registered IRMA 75 achieving material to downstream user groups.

Key Points for the Segregated Chain of Custody Model

- The number of sources of IRMA-audited mine sites is unlimited provided they all have the same IRMA achievement level.
- The percentage/proportion of IRMA-audited material from each individual mine site can vary in the combined segregated product provided the material from each individual mine site has the same IRMA achievement level.

3. Controlled Blending Model

The controlled blending model is a chain of custody model in which materials or products with *IRMA Standard achievement levels* are mixed according to certain criteria with materials or products without that set of characteristics. This results in a known proportion of the *IRMA Standard achievement levels* within all parts of the final output. The ratio between inputs is known for a given mass (e.g., batch or lot). The output percentages can therefore be ensured in all cases.

An example of controlled blending would be taking the production from three IRMA-audited mines and individually stockpiling their production over a year, then blending the three stockpiles to provide a consistent mixture of feed for downstream processing and retaining the same mixture of IRMA-audited materials throughout the production process. The mixture can contain materials with different IRMA achievement levels, however the claim for the IRMA achievement level would have to be based on the material with the lowest achievement level. Using the above example, if two of the mines produce IRMA 75 achieving materials which are then mixed with one mine producing IRMA 50 achieving materials, the mixture would have to be claimed as containing only IRMA 50 materials.

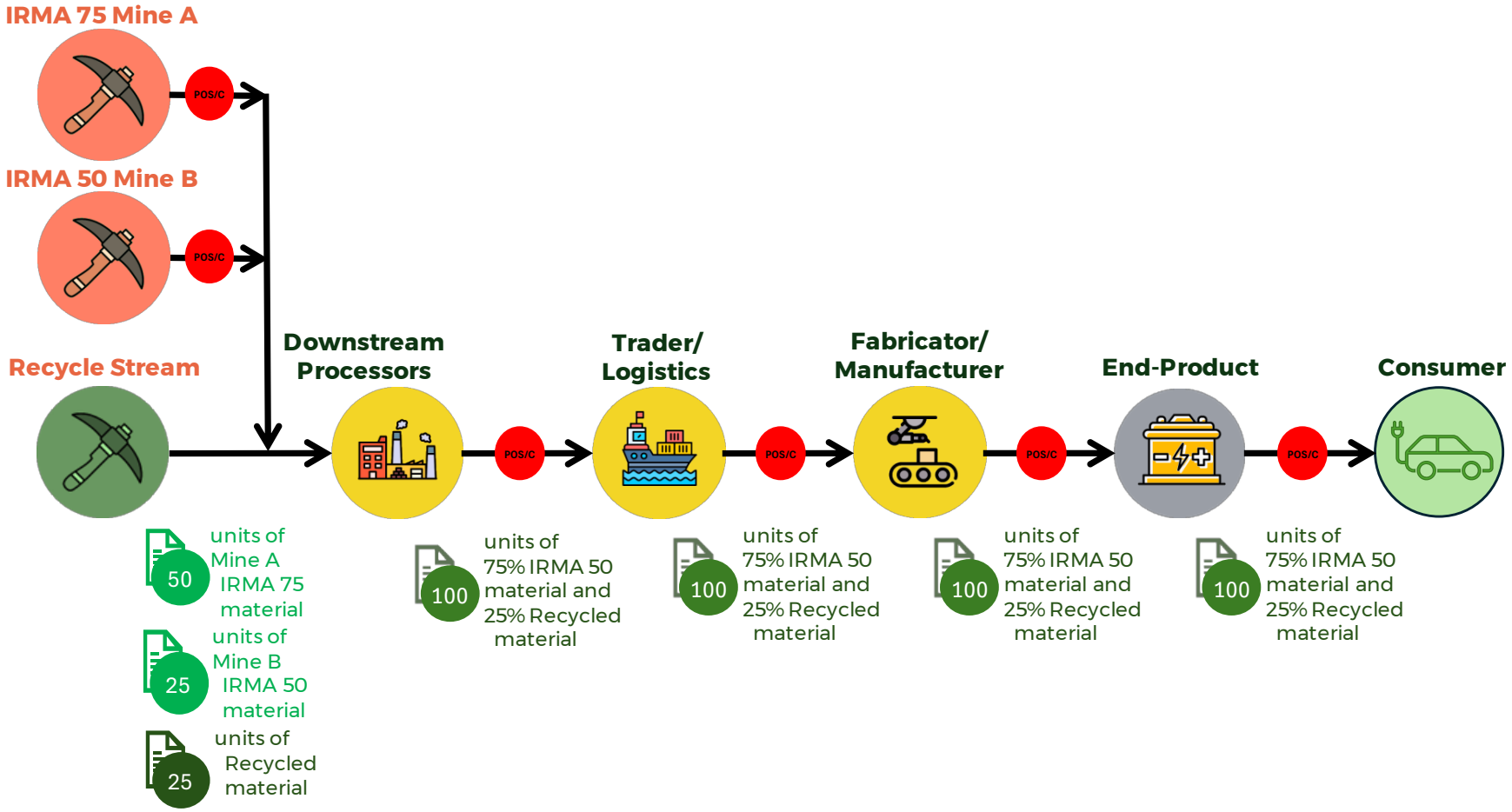
The controlled blending model ensures verifiable quantities of materials or products are identifiable from the original sources of different IRMA achievement levels and therefore satisfies item-based expectations of organizations active in the chain of custody, consumers, or other end users. The controlled blending model is most applicable to situations where one or more mines or mineral processing facilities producing different IRMA-audited level products are mixed and further downstream processing is performed for the combined materials in the exact same proportions in dedicated batches or at dedicated facilities.

IRMA CoC Standard C.3 IRMA CoC Standard Requirements for Controlled Blending Model requires the following:

> *C.3.1. The Entity applying the controlled blending model shall ensure that the quantity of physical inputs and outputs (volume or weight) at the site are monitored and documented. The Entity shall ensure that the output supplied to customers from a site does not exceed the percentage of input with IRMA achievement levels received at the site. The percentage of controlled blended output delivered is always subject to the available percentage as determined by input, current stock, or combination thereof. This shall be achieved by demonstrating:*
>
> *a) physical separation of blended material or product in terms of production, transport and storage;*
> *b) clear identification of the blended material or product during the process;*
> *c) the output quantities corresponding to the input quantities in line with an appropriate conversion factor.*

A simplified illustration of the controlled blending model and supply chain as applied to IRMA-audited material is shown in Figure 3. The figure shows an example where Mine A is an IRMA 75 achieving mine site that produces and records 50 units (e.g., ounces, kilograms, tonnes, etc.,.) of IRMA 75 achieving material in the IRMA CoC Registry and Mine B produces and records 25 units of IRMA 50 achieving material in the IRMA CoC Registry. The 75 units of material from the two IRMA-audited mines is blended and mixed with 25 units of recycled material. This results in the production of 100 units of material containing 75% IRMA 50 material (due to blending IRMA 75 and IRMA 50) and 25% recycled material which can then be transferred or sold to downstream user groups.

Figure A.3.1. IRMA Controlled Blending Model (adapted from ISO Std No. 22095:2020)



4. Mass Balance Model

The mass balance model is a chain of custody model in which materials or products with IRMA Standard achievement levels are mixed with materials or products without the same characteristics, resulting in a claim on a part of the output, proportional to the input. A mass balance CoC model is designed to track the total amount of desired content (e.g., IRMA-audited material) through the production system and ensure an accurate accounting of this content to the output product based on auditable bookkeeping. A key characteristic of mass balance model is that the actual physical presence of the desired characteristic, such as IRMA-audited material, in the product is low or unknown. A mass balance model is best suited when the volumes or values of goods or materials from IRMA-audited mine sites are too low to be shipped, stored, or processed separately or the technical process does not allow for differentiation.

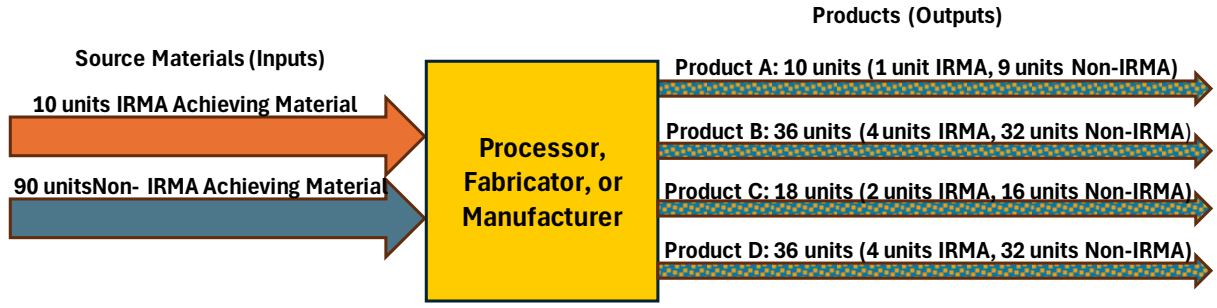
The mass balance model recognizes that the achievement of the proportions in the output can involve intermediate steps introducing non-IRMA material that result in dilution of the percentage of IRMA-audited material. This chain of custody model, which represents many metal/mineral supply chains, gives the Entity active in the chain of custody the opportunity to account for continuous processes with multiple inputs between multiple sites with differing IRMA-audited levels and different non-IRMA materials.

For Entities using the mass balance model, two implementation methods may be used, the rolling average percentage and the free allocation methods, as described in the following sections.

Rolling Average Percentage implementation method

The rolling average percentage method is based on the use of a fluctuating proportion of input bearing specified characteristics entering the Entity over a defined claim period, allowing a claim of an average percentage to be made for the output over the claim period. This method assumes that IRMA-audited material units flow the same way as non-IRMA-audited material units and therefore have the same distribution among outputs. The IRMA-audited material inputs flow to outputs in accordance with the yield in which they went in. For example, as demonstrated in Figure 4, if 10 % of the input stream is comprised of IRMA-audited material, then 10 % of each output stream is considered to contain IRMA-audited material content and material content must be identified as such (Figure 4). This is the most straightforward allocation method, and it does not allow for flexibility in the material content allocation process. This approach may not be reasonable for some mineral supply chains as percentages are highly variable and result in inconsistent content amounts and low percentages of specified contents (e.g., 10% IRMA-audited material contents).

Figure A.4.1. IRMA CoC Example of Mass Balance Rolling Average Implementation Method

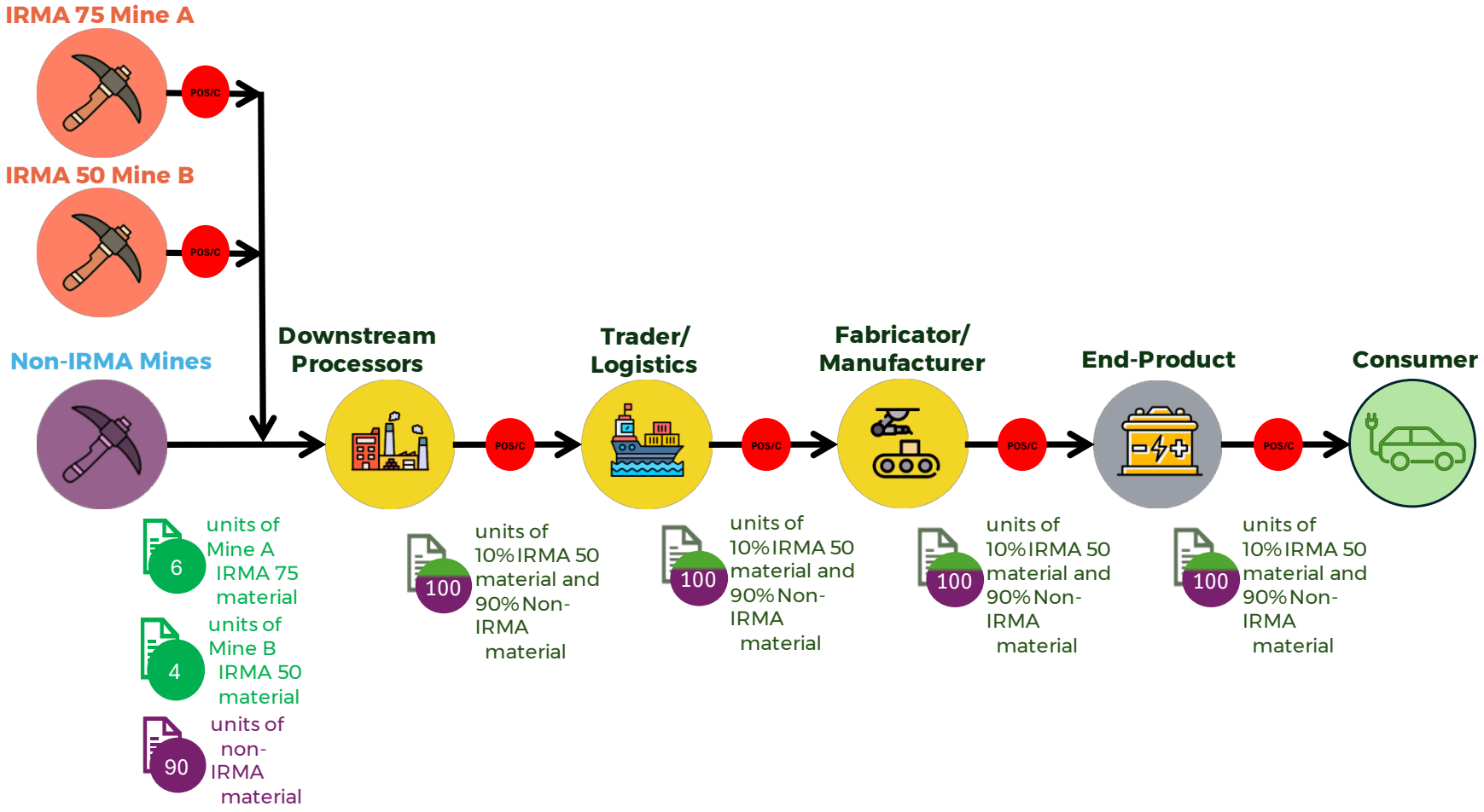


IRMA CoC Standard C.4 IRMA CoC Standard Requirements for Mass Balance Model requires the following:

> *C.4.1. Rolling Average Percentage Method.*
> *The Entity applying the mass balance model* ***with the rolling-average percentage method*** *shall calculate the average percentage of the inputs and outputs of a defined category of IRMA achievement level for each material or product. For each material or product, the Entity shall define claim periods, which shall correspond to the claimed relation of the input to the output. These input and output claim periods shall not exceed one year.*

A simplified illustration of the mass balance rolling average implementation model and supply chain as applied to IRMA-audited material is shown in Figure 5. The figure shows an example where Mine A is an IRMA 75 achieving mine site that produces and records 6 units (e.g., ounces, kilograms, tonnes, etc.,.) of IRMA 75 achieving material in the IRMA CoC Registry and Mine B produces and records 4 units of IRMA 50 achieving material in the IRMA CoC Registry. The 10 units of material from the two IRMA-audited mines is blended and mixed with 90 units of non-IRMA-audited material. This results in the production of 100 units of material containing 10% IRMA 50 material (due to blending IRMA 75 and IRMA 50) and 90% non-IRMA material which can then be transferred or sold to downstream user groups.

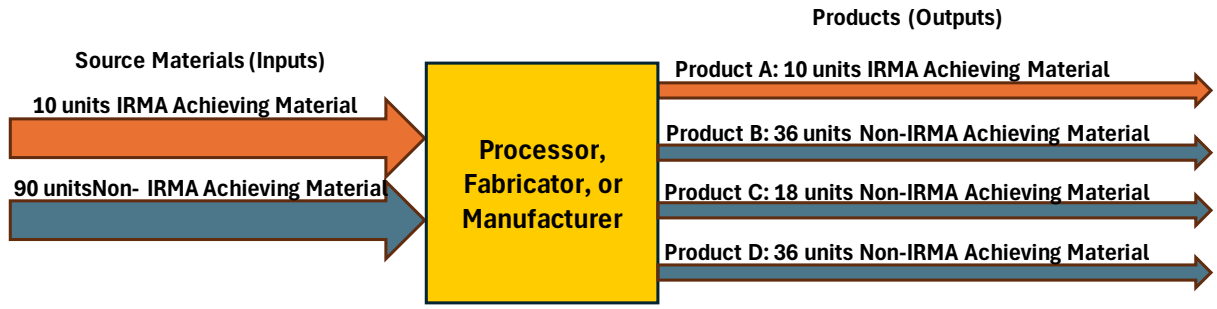
Figure A.4.2. IRMA Mass Balance Model (Rolling Average Percentage Method) (adapted from ISO Std No. 22095:2020)



FREE ALLOCATION implementation method

The free allocation implementation method is applicable when two or more types of input are used in a material or product. The recorded output amount of each type shall be equivalent to the physical input, considering the conversion factor. Many downstream processors, fabricators and manufacturer's produce multiple outputs, many of which may not have a market for IRMA-audited material content. Non-proportional allocation as represented by the free allocation implementation method allows for allocated units to be freely assigned to any product. For example, one output product can be allocated 100 % of the IRMA-audited material content and claim and the other products have no claim as to content (Figure 6). This approach offers the highest degree of freedom and flexibility, but concerns have been made regarding consumer understanding and trust. However, most CoC mass balance systems allow non-proportional free allocation as a practical matter.

Figure A.4.3. IRMA CoC Example of Mass Balance Free Allocation Implementation Method



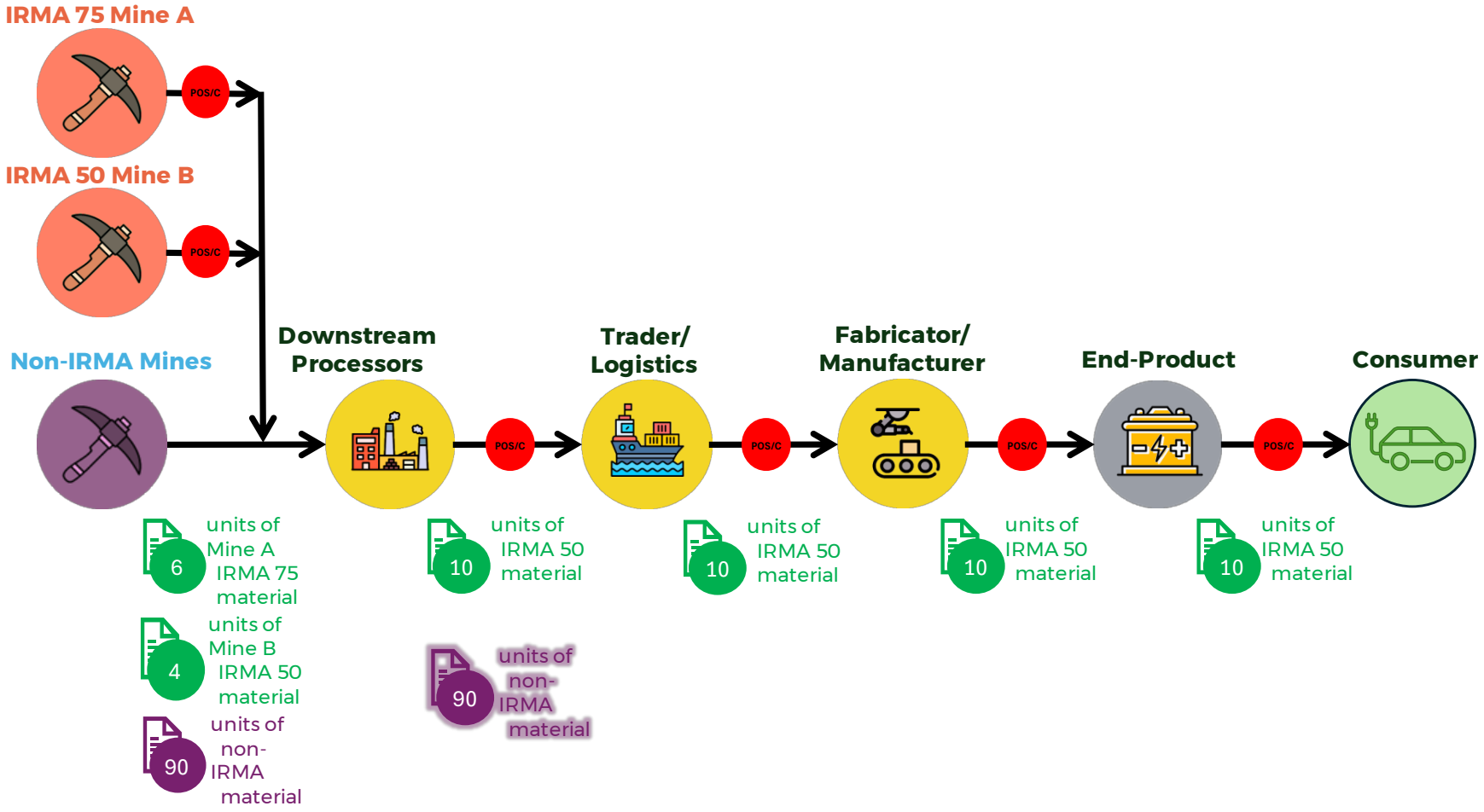
IRMA CoC Standard C.4 IRMA CoC Standard Requirements for Mass Balance Model requires the following:

> *C.4.2. Free Allocation method.*
> *The Entity applying the mass balance model **with the free allocation method** shall calculate the allocated amounts of the inputs and outputs of a defined category of IRMA achievement level for each material or product as follows:*
>
> *a) The conversion factor shall be defined within each material or product at each site, and it shall be applied to define the allocated amounts to enter the allocation account, when using the output as the basis for calculation, or to withdraw the allocated amounts when using the input as the basis for calculation.*
>
> *b) The allocation account balance shall be calculated for each period according to the formula given in Appendix 1. For each material or product, the organization shall set up and maintain an allocation account for each type of input used as an output declaration. The organization shall ensure that the allocation account is not overdrawn within the balancing period.*

c) *An organization using the free allocation method shall deduct from the allocation account the respective allocated amount of the output, up to the limit in, but not exceeding, the allocated account within the balancing period.*
d) *The balancing period shall not exceed the evaluation period. The balancing period should be as short as possible. The length of the balancing period shall be evaluated, taking into account the varying needs of different sectors and the desired effectiveness of the system.*

A simplified illustration of the mass balance free allocation implementation model and supply chain as applied to IRMA-audited material is shown in Figure 7. The figure shows an example where Mine A is an IRMA 75 achieving mine site that produces and records 6 units (e.g., ounces, kilograms, tonnes, etc.,.) of IRMA 75 achieving material in the IRMA CoC Registry and Mine B produces and records 4 units of IRMA 50 achieving material in the IRMA CoC Registry. The 10 units of material from the two IRMA-audited mines are blended and mixed with 90 units of non-IRMA-audited material. This results in the production of 10 units of material containing 100% IRMA 50 material (due to blending IRMA 75 and IRMA 50) which can then be transferred or sold to downstream user groups. It also results in 90 units of 100% non-IRMA material for which no IRMA claims can be made.

Figure A.4.4. IRMA Mass Balance Model (Free Allocation Method) (adapted from ISO Std No. 22095:2020)



The Mass Balance Implementation Methods for the CoC Model are further illustrated in the following example.

Platinum Group Metals Mine Site – Mass Balance Rolling Average and Free Allocation Scenarios

A platinum group metals (PGM) producing company has multiple mine sites which produce PGM containing concentrates which are shipped to a single smelting and refining complex. The company's mine sites consist of a mix of IRMA 75 and IRMA 50 achieving mines and non-IRMA mines. The smelting and refining complex is also used to process PGM concentrates from mine sites not owned by the PGM producing company as well as other precious metals containing concentrates from sites both owned by the same PGM producing company or by others. In total the materials that are produced by the complex contain inputs from more than 20 different individual mine sites. The total input from any given mine site does not exceed 10%, and the combined input from all IRMA-audited mines is approximately 20%.

The PGM company produced 400,000 troy ounces of platinum (Pt) of which 100,000 ounces was attributable to IRMA 50 mines and 50,000 ounces attributable to IRMA 75 mines. The same 400,000 troy ounces from the PGM company was combined with 800,000 troy ounces from other sources resulting in a mixture of 150,000 ounces of mixed IRMA 50 and IRMA 75 contained in 800,000 total ounces, or 19 % IRMA 50 achieving material based on combining the IRMA 50 and 75 achieving materials.

Using the rolling average method the platinum production from the smelting and refining complex would be able to claim 800,000 troy ounces of Pt production containing 19% IRMA-audited Pt. However, the PGM company has been told by their customers that they need Pt that consists of IRMA 50 or higher achieving Pt to satisfy consumer demand. The same company, by using the free allocation method, would be able to use mass balance allocated units and sell 150,000 ounces of their Pt as IRMA 50 or higher achieving material.

Key Considerations for Mass Balance Models

- **System boundary:** Mine sites often generate multiple metals and/or minerals, which can be sent to different facilities for further processing and utilized in various end-products. Further, many large mining Entities have multiple processing facilities spread across geographic regions. As a result, defining a system boundary for performing a mass balance is necessary. The system boundary will be specific to each supply chain utilizing IRMA-audited material. (see IRMA CoC Standard 1.1.5.a).
- **Material Units:** When mined materials are produced the mass of material is transformed into a stated unit conversion. Typical mass unit examples include tonnes (metric tons), kilograms and troy ounces. Units can be specific to the transformation within the given system; however, the system cannot use multiple units. However, different Entities may use, and jurisdictions require, the use, different units. This can be a cause of complexity and confusion and may be a barrier to interoperability across certification systems unless calibrations or conversion principles are established.
- **Connectivity and Traceability:** ISO 22095:2020 defines traceability as the "ability to trace the history, application, location or source(s) of a material or product throughout the supply chain." Mine site and most downstream operations allow for physical connectivity, and thus associated traceability. However, not all facilities have physical connectivity. For example, a fabrication facility may produce multiple product lines such that IRMA-audited material could physically be in all outgoing products. Another Entity may operate fabrication product lines in parallel, with no physical connection between sets of processes. Following processing, the actual chemical elements in mined materials are identical. Therefore, IRMA-audited materials could have been in all products, but physically they are separated (not connected by pipes or other conveyances).
- **Proportional versus Non-Proportional Allocation:** The assignment of IRMA-audited materials to end-products can be either proportionally or non-proportionally allocated. Proportional allocation means that the number of available allocated units is split according to yield or distribution. Nonproportional allocation allows available IRMA-audited material to be freely attributed amongst end-products, i.e., it allows Entities to allocate content to where it is most valued and needed in the market. In principle, under non-proportional allocation, 100 % of allocated units could be attributed to a single product stream and 0 % to the other product streams even though IRMA-audited material is distributed throughout all product streams. These concepts are further described in this document with the mass balance rolling average percentage implementation method which is based on proportional allocation and the mass balance allocation implementation method which is based on non-proportional allocation.
- **Balancing Period, Reconciliation Period, and Accounting Period:** In accounting, reconciliation is the process of ensuring that two sets of records (e.g., the balances of two accounts) agree. In a mass balance, reconciliation is used to ensure that the number of mass units (e.g., tonnes, kilograms, troy ounces) leaving the system (i.e., in end-products) matches the actual units entering and used in the system. This is done by making sure the balances match at the end of a particular accounting period. Typical mass balancing periods are 1, 3, or 12 months (with three months being the most common). For example, some Entities results are typically audited in monthly tranches within a yearly accounting period, but others may use a three-month balancing period. Results are reconciled at the end of the Accounting Period for both the Accounting Period and each of the monthly tranches. (see IRMA CoC Standard 3.7).

5. Book and Claim Credit Model

The objective of the book and claim credit model is to ensure that for each purchase for which a claim is made, materials or products with the same specified characteristics have been produced. The book and claim model is most suitable for intangible materials or products and in circumstances where the entire market is controlled.

The book and claim credit model is an alternative chain of custody model in which the administrative record flow is not connected to the physical flow of materials or products throughout the supply chain. After production, the information on specified characteristics within the supply chain is decoupled from any material or product. Credits are issued when materials or products enter the market. The credits may be traded and sold independently of the physical delivery of materials or products. The entry to the market of materials or products under book and claim may take place after part of the supply chain has operated under another chain of custody model.

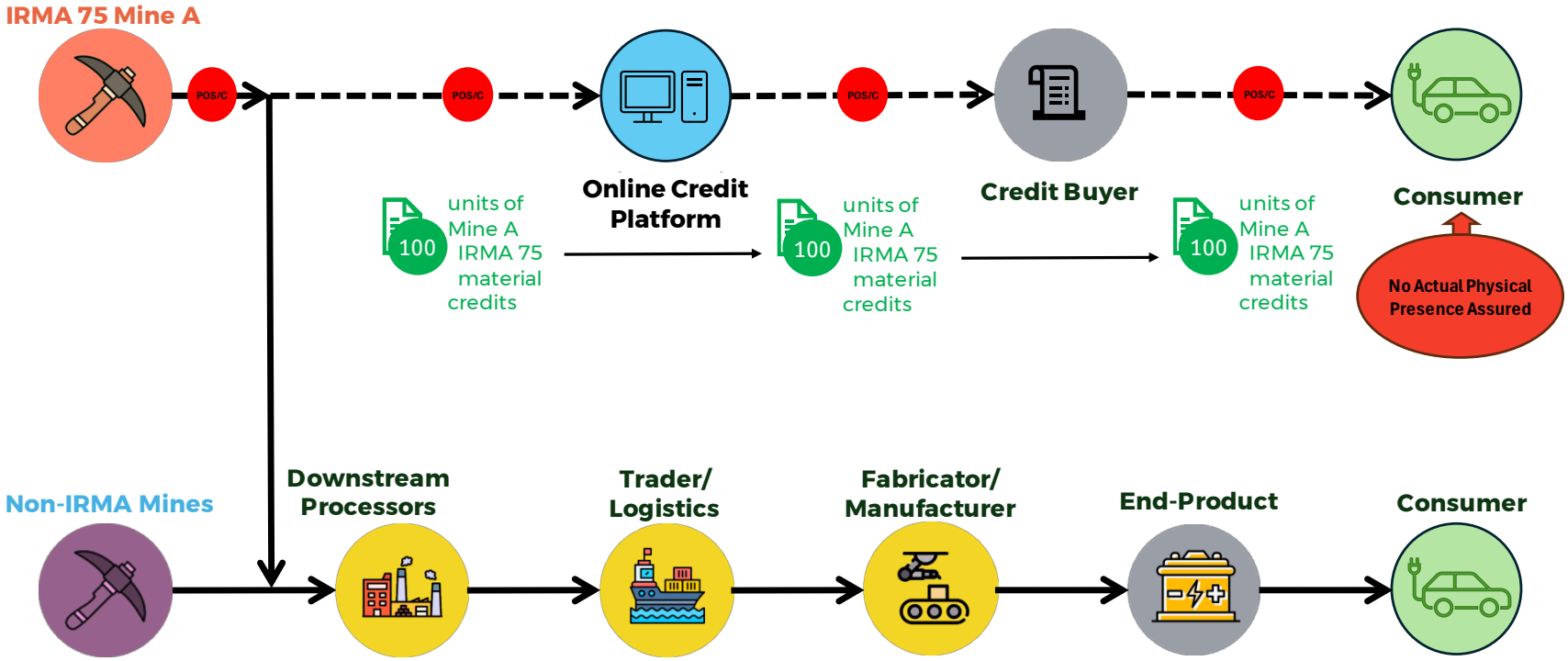
IRMA CoC Standard C.5 Requirements for Book and Claim Credit Model requires the following:

> *C.5.1. The Entity applying the book and claim credit model shall calculate the credit of the inputs and outputs of a defined category of IRMA achievement level for each material or product as follows:*
>
> *a) The conversion factor shall be defined within each material or product at each site, and it shall be applied to define the amount of credit to enter the credit account, when using the output as the basis for calculation, or to withdraw the credit when using the input as the basis for calculation.*
>
> *b) The credit account balance shall be calculated for each period according to the formula given in Appendix 1. For each material or product, the organization shall set up and maintain a credit account for each type of input used as an output declaration. The organization shall ensure that the credit account is not overdrawn within the balancing period.*
>
> *c) An organization using the credit method shall deduct from the credit account the respective credit of the output, up to the limit in, but not exceeding, the credit account within the balancing period.*
>
> *d) The balancing period shall not exceed the evaluation period. The balancing period should be as short as possible. The length of the balancing period shall be evaluated, taking into account the varying needs of different sectors and the desired effectiveness of the system.*

A simplified illustration of the book and claim credit model and supply chain as applied to IRMA-audited material is shown in Figure 8. The figure shows an example where Mine A is an IRMA 75 achieving mine site that produces and records 6 units (e.g., ounces, kilograms, tonnes, etc.) of IRMA 75 achieving material in the IRMA CoC Registry and Mine B produces and records 4 units of IRMA 50 achieving material in

the IRMA CoC Registry. The 10 units of material from the two IRMA-audited mines are blended and mixed with 90 units of non-IRMA-audited material. This results in the production of 10 units of material containing 100% IRMA 50 material (due to blending IRMA 75 and IRMA 50) which can then be transferred or sold to downstream user groups. It also results in 90 units of 100% non-IRMA material for which no IRMA claims can be made.

Figure A.5.1. IRMA Book and Claim Credit Model (adapted from ISO Std No. 22095:2020)



Platinum Group Metals Mine Site – Book and Claim Scenario

In the previous example, a platinum group metals (PGM) producing company has multiple mine sites which produce PGM containing concentrates which are shipped to a single smelting and refining complex. The company's mine sites consist of a mix of IRMA 75 and IRMA 50 achieving mines and non-IRMA mines. The smelting and refining complex is also used to process PGM concentrates from mine sites not owned by the PGM producing company as well as other precious metals containing concentrates from sites both owned by the same PGM producing company or by others. In total the materials that are produced by the complex contain inputs from more than 20 different individual mine sites. The total input from any given mine site does not exceed 10%, and the combined input from all IRMA-audited mines is approximately 20%.

The PGM company produced 400,000 troy ounces of platinum (Pt) of which 100,000 ounces was attributable to IRMA 50 mines and 50,000 ounces attributable to IRMA 75 mines. The same 400,000 troy ounces from the PGM company was combined with 800,000 troy ounces from other sources resulting in a mixture of 150,000 ounces of mixed IRMA 50 and IRMA 75 contained in 800,000 total ounces, or 19 % IRMA 50 achieving material based on combining the IRMA 50 and 75 achieving materials.

Using the book and claim credit method the platinum production from the smelting and refining complex the company, by using the book and claim credit method, would be able to sell 100,000 ounces of credits for IRMA 50 achieving material and 50,000 ounces of credits for IRMA 75 achieving material. The purchaser(s) of those Pt credits would then be able to claim that products containing 100,000 ounces of Pt from any source support IRMA 50 achieving material, and that products containing 50,000 ounces of Pt from any source support IRMA 75 achieving material based on using the book and claim credits.

Annex 2 – Commodity Specific Normative Guidance

The following sections provide rules, guidelines, or characteristics for IRMA's CoC Standard specific to individual mined and processed materials. Each section provides a flowsheet and description of the supply chain based on the most used current mining, processing, fabrication, and manufacturing methods. Recycling, both internal and external, are also identified. The information is not intended to be exhaustive or cover all supply chains but rather provides examples.

This version contains normative guidance for the following:

1. Cobalt
2. Copper
3. Graphite
4. Iron
5. Lithium
6. Nickel
7. Platinum Group Metals (PGMs)
8. Titanium
9. Zirconium

Additional normative guidance for mined materials will be added in the future or on request.

The flowsheets in this Annex indicate where a potential point of sale and/or transfer (PST) may occur as shown by the following symbol:

For each PST, an example of the corresponding material flow is provided, which would need to be identified in the chain of custody and the identified information in the normative guidance input into the IRMA CoC Register.

1. Cobalt

Cobalt is primarily used as cathodes in rechargeable batteries and in superalloys for turbine engines in jet aircraft. Carbon-neutral applications include EV batteries in addition to turbine engines for power generation. It is also used in a wide variety of other applications such as metal alloys and chemicals.

Global production of cobalt in 2023 was estimated as 230,000 tonnes.[8] Nearly all cobalt is produced as a byproduct from sulfide deposits, copper-cobalt (Cu-Co) sedimentary deposits and nickel-cobalt (Ni-Co) laterite deposits. Historically production has been primarily associated with the mining of Ni-Co and sulfide deposits, but currently it is dominated by production from Cu-Co deposits located in the Central African Copperbelt. Recycling of cobalt from scrap was estimated at 25% of consumption.[9]

The steps in the cobalt supply chain from mine to end user are shown in Figure A2.1.1. The processes shown are not intended to be exhaustive but are typical of the current commodity supply chain and intended for the purpose of explaining the flow of IRMA-audited cobalt given current industry practice.

Cu-Co sedimentary deposits are typically mined by open pit mining methods. The oxide ore is crushed, ground and acid leached while sulfide ore is roasted prior to acid leaching. Copper is extracted removed from the leach solution by SX/EW to form cathode copper and cobalt is produced as a cobalt hydroxide ($Co(OH)_2$) precipitate. The precipitate is then sold to downstream processors who re-leach and refine the cobalt to produce cobalt chemicals used in the fabrication process. Alternatively, the cobalt containing leach solution can be treated by SX/EW to produce cobalt metal.

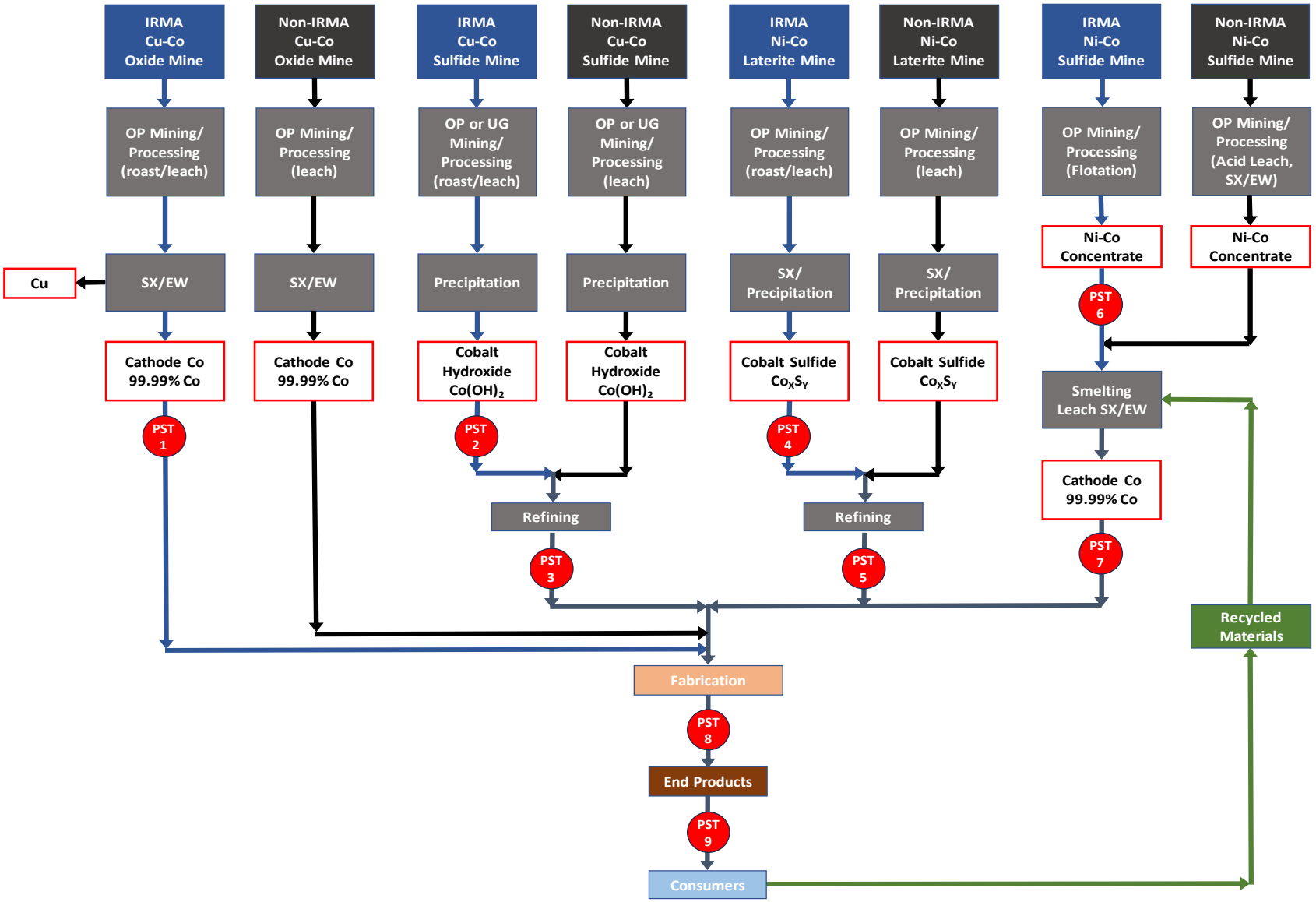
Cu-Ni laterite deposits are typically mined by open pit mining methods. The ore is crushed, roasted, ammonia leached, and a copper sulfide precipitate is produced. More recently a high-pressure acid leach process that can produce cobalt powder or metal has been introduced.

Cobalt is derived from sulfide ores as a byproduct following smelting and is recovered by acid leaching the cobalt from the smelter matte followed by SX and reduction to make cobalt powder or EW to make cobalt metal.

Cobalt is a highly recycled metal with a current end-of-life recycling rate estimated at 32%.[10] Cobalt scrap may be smelted and/or refined depending on its impurities.

[8] USGS 2024. https://pubs.usgs.gov/periodicals/mcs2024/mcs2024-cobalt.pdf
[9] Ibid.
[10] IEA (2021), End-of-life recycling rates for selected metals, IEA, Paris https://www.iea.org/data-and-statistics/charts/end-of-life-recycling-rates-for-selected-metals

Figure A2.1.1. Cobalt Production Supply Chain



Refined cobalt is sold and/or transferred to fabricators in various forms including cathode, cobalt hydroxide, and cobalt sulfide which are fabricated into parts such as cathodes, alloys, and chemicals. These products are then sold and/or transferred to be used in the manufacture of intermediate and end-use products.

IRMA CoC Standard Normative Requirements for cobalt are as follows:

4.1 Individual IRMA mine site production of cobalt from Cu-Co oxide mines in the form of cathode copper as indicated by **PST 1,** Cu-Co sulfide mines following processing and precipitation of cobalt hydroxide as indicated by **PST 2**, from Ni-Co laterite mines in the form of cobalt sulfide as indicated by **PST 3,** and from Ni-Co sulfide mines as indicated by PST 4, all form the basis of the IRMA-audited claim in terms of achievement level and quantity of cobalt produced achieving that level. The supply chain data should show the achievement level and quantity of cobalt as metal for each individual IRMA mine.

4.2 IRMA mine production of cobalt hydroxide and cobalt sulfide is sold and/or transferred and then combined with non-IRMA mine production and fed to refining facilities. The supply chain data does not need to include the individual non-IRMA mine sources but does need to identify the agglomerated percentage of non-IRMA mine site production in refined cobalt sold and/or transferred as indicated by **PST 5** and **PST 6**.

4.3 Output of concentrate from Ni-Co sulfide processing to smelting which can then be sold and/or transferred and mixed with non-IRMA material should be tracked including for dilution as indicated by **PST 7.**

4.4 If products are not ready for fabrication, but require additional processing, for example by a toll facility, for an IRMA claim on those materials to be made, if they are mixed with other materials in the toll facility, the claim would have to be diluted by the total inputs to the tolling facility. The Entity producing the materials could only make an IRMA claim by acknowledging the further dilution.

4.5 Smelting, refining, and other processing and conversion losses do count against an IRMA claim and must be consistent with the mass balance accounting of those losses.

4.6 Individual forms of cobalt produced and sold and/or transferred to fabricators, should indicate the achievement level and contained percentage for the indicated IRMA-audited metal.

4.7 Individual forms of cobalt from fabrication sold and/or transferred, as indicated by **PST 8** and delivered to end-product users, should show the IRMA achievement level and contained percentage of copper received from fabricators. The same information should be provided with respect to the sale and/or transfer of end products delivered to Consumers as indicated by **PST 9**.

4.8 Internal process and consumer recycling should be accounted for as per IRMA Standard CoC Normative Guidance Section 6. Recycled Materials.

2. Copper

Copper has a wide variety of uses, the foremost of which is electrical power conduction in cables connecting existing power generation and supply systems to consumers as well as for individual components and products. Carbon-neutral applications include expansion of the existing electrical grid as well as in renewable energy applications. It is also a major component in communications, construction, industrial machinery, and equipment, as well as various chemical applications.

Global production of copper in 2023 was estimated as 22,000,000 tonnes.[11] Copper is produced from both primary and secondary (e.g., recycling) sources. The primary source of copper is sulfide ore comprising approximately 81% of mine site production, and the other primary source is oxide ore comprising approximately 19% of mine site production. In 2022, secondary copper production in the form of recycled scrap feed to refineries was 16.2% of total refined copper production.[12]

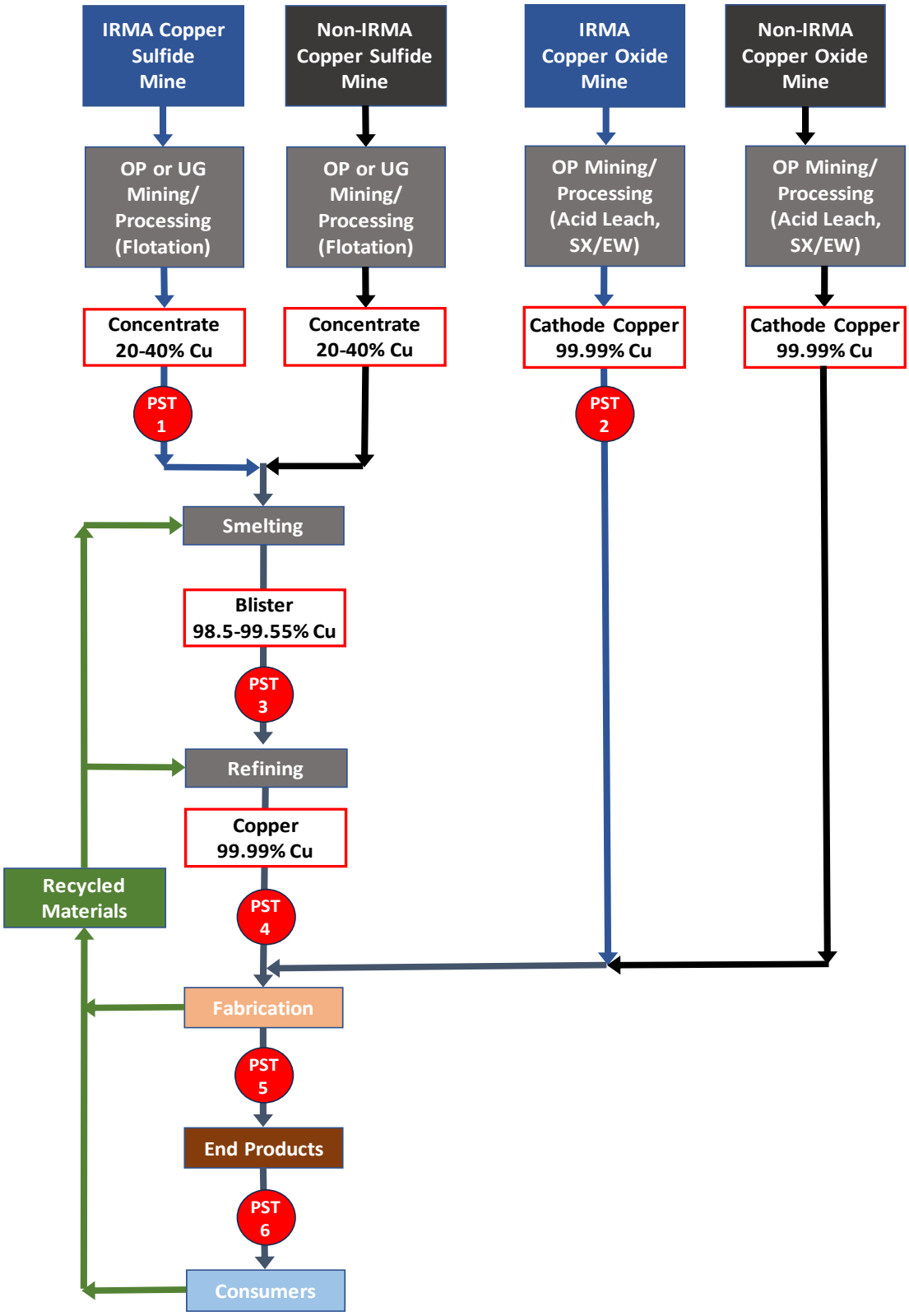
The steps in the copper supply chain from mine to end user are shown in Figure A2.2.1. The processes shown are not intended to be exhaustive but are typical of the current commodity supply chain and intended for the purpose of explaining the flow of IRMA-audited copper given current industry practice.

Copper sulfide ore may be mined by either underground or open pit mining methods, with open pit mining methods being commonly used. The mined ore is crushed, ground, and processed by flotation beneficiation to produce a copper sulfide mineral concentrate ranging from 20-40% copper content and averaging approximately 30% copper. Copper concentrate is sold and/or transferred to a smelter to produce "matte" which contains 50-70% copper and then converted to blister copper containing 98.5-99.5% copper content. The blister copper is then sold and/or transferred to be further processed by fire-refining or electro-refining to produce +99.99% copper content. Some sulfide ores are also processed using a leaching process like that described below for oxide copper ore.

Copper oxide ore is typically mined using open pit methods. Run-of-mine ore, although crushing may be used, is stacked in piles, and a dilute sulfuric acid solution is percolated through the pile which dissolves the leachable copper, with the resulting copper bearing leach solution being processed by solvent extraction and electrowinning (SX/EW). The output from SX/EW is in the form of electro-refined copper cathodes and is a finished product with +99.99% copper content which can be sold and/or transferred directly for fabrication, bypassing the smelting and refining processes.

[11] USGS 2024. https://pubs.usgs.gov/periodicals/mcs2024/mcs2024-copper.pdf
[12] The World Copper Factbook 2023, INTERNATIONAL COPPER STUDY GROUP. https://icsg.org/copper-factbook/

Figure A2.2.1. Copper Production Supply Chain



Copper is a highly recycled metal with a current end-of-life recycling rate estimated at 46%.[13] Copper scrap may be smelted and/or refined depending on its impurities.

Refined copper is provided to fabricators in various forms including cathode, wire rod, billet, cake, or ingot from which fabricators form wire, rod, tube, sheet, plate, strip, castings, powder, and other shapes. These products are then sold and/or transferred to be used in the manufacture of intermediate and end-use products.

IRMA CoC Standard Normative Requirements for copper are as follows:

4.1 Individual IRMA mine site production of copper from sulfide mines following concentration, as indicated by **PST 1** and from oxide mines in the form of cathode copper as indicated by **PST 2** shall form the basis of the IRMA-audited claim in terms of achievement level and quantity of copper produced achieving that level. The supply chain data should show the achievement level and quantity of copper as metal for each individual IRMA mine.

4.2 IRMA mine production from copper sulfide mines is sold and/or transferred and then combined with non-IRMA mine production and fed to smelting facilities. The supply chain data does not need to include the individual non-IRMA mine sources but does need to identify the agglomerated percentage of non-IRMA mine site production in the blister copper sold and/or transferred as indicated by **PST 3**.

4.3 Output from smelting shall be tracked to downstream refining processes and their production of high purity copper which can then be sold and/or transferred for fabrication as indicated by **PST 4.**

4.4 If products are not ready for fabrication, but require additional processing, for example by a toll facility, for an IRMA claim on those materials to be made, if they are mixed with other materials in the toll facility, the claim would have to be diluted by the total inputs to the tolling facility. The Entity producing the materials could only make an IRMA claim by acknowledging the further dilution.

4.5 Smelting, refining, and other processing and conversion losses do count against an IRMA claim and must be consistent with the mass balance accounting of those losses.

4.6 Individual forms of copper produced and sold and/or transferred to fabricators, should indicate the achievement level and contained percentage for the indicated IRMA-audited metal.

4.7 Individual forms of copper from fabrication sold and/or transferred, as indicated by **PST 5** and delivered to end-product users, should show the IRMA achievement level and contained percentage of copper received from fabricators. The same information should be provided with respect to the sale and/or transfer of end products delivered to Consumers as indicated by **PST 6.**

4.8 Internal process and consumer recycling should be accounted for as per IRMA Standard CoC Normative Guidance Section 6. Recycled Materials.

[13] IEA (2021), End-of-life recycling rates for selected metals, IEA, Paris https://www.iea.org/data-and-statistics/charts/end-of-life-recycling-rates-for-selected-metals

3. Graphite

Graphite is a form of pure carbon that occurs naturally or can be derived synthetically from petroleum coke which is a byproduct of petroleum refining. It has key properties, including chemical inertness, thermal stability, high electrical conductivity, and lubricity (slipperiness) that make it suitable for many industrial applications. This includes batteries, metallurgy, and steelmaking. For some of these uses, such as battery anodes, no suitable substitutes are currently available. Steelmaking and refractory applications in metallurgy currently use the largest amount of produced graphite; however, emerging technology uses in battery applications, both for EVs and industrial scale use, will increase world demand for graphite.

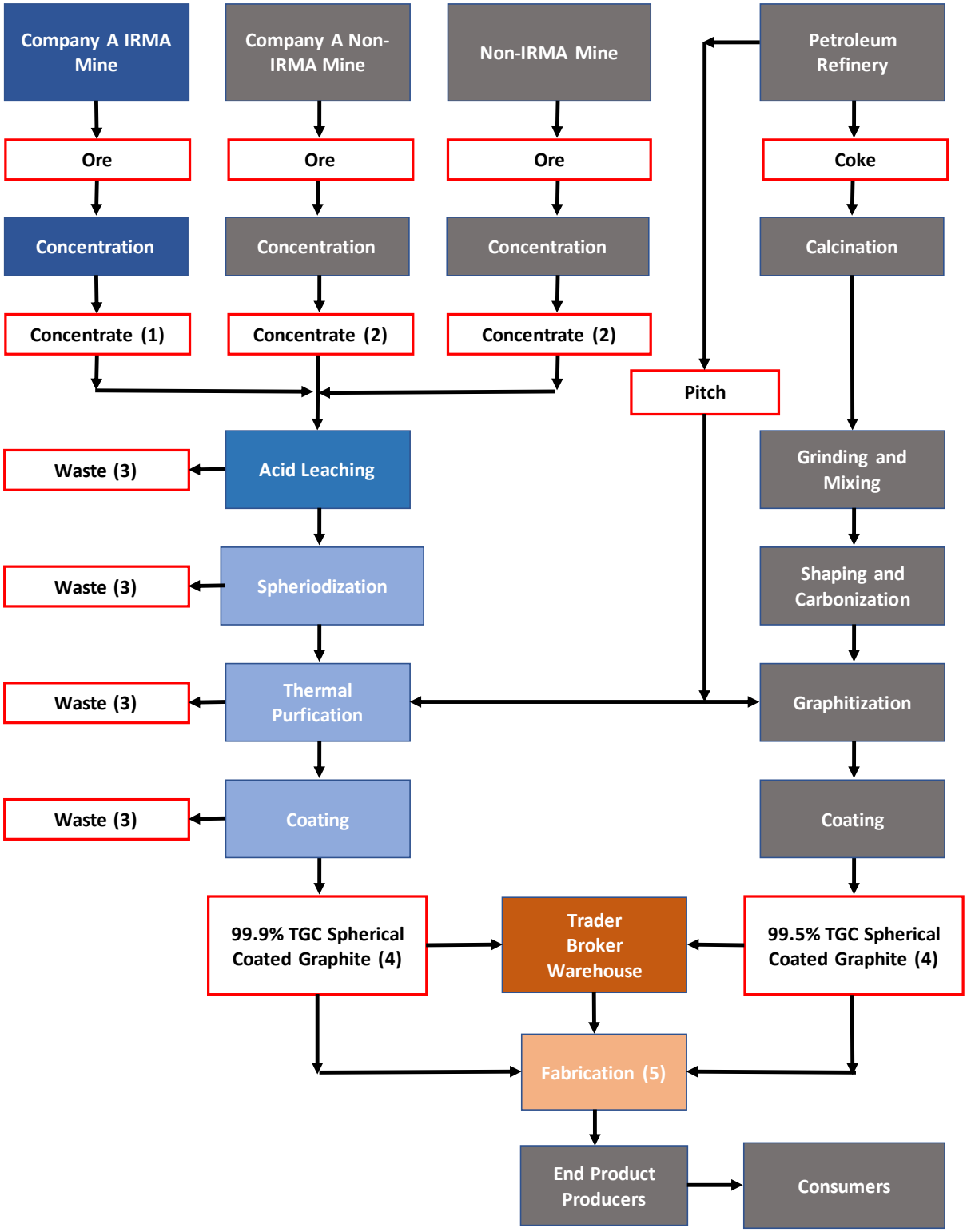
Synthetic graphite is manufactured from hydrocarbon sources that produce petroleum coke using high-temperature heat treatment, and it is more expensive to produce than natural graphite. Graphite ores are classified as "amorphous" (micro-crystalline), and "crystalline" ("flake" or "lump or chip"). Thermally metamorphosed coal is the usual source of amorphous graphite. Disseminated crystalline flake graphite is mined from carbonaceous metamorphic rocks, and lump or chip graphite is mined from veins in high-grade metamorphic regions.[14]

The processes for producing graphite from mine to end use are shown in Figure A2.3.1. The processes shown are not intended to be exhaustive but instead intended to be typical and for the purpose of explaining the flow of IRMA-audited graphite given current industry practice with an emphasis on chain of supply for decarbonization purposes such as energy storage batteries.

Natural graphite is mined to produce ore from both open pit and underground mine operations. Concentration processes for graphite vary from simple hand sorting and screening of high-grade ore at some amorphous graphite deposits and at high-grade vein operations, to multistage crushing, screening, washing, and flotation cycles required to produce high-quality and high-purity graphite flake and powder products. Graphite concentrates may contain from 50% to greater than 90% total graphite carbon (TGC). The concentrates are then chemically treated using hydrofluoric acid (HF) to elevate to a purity higher than 99%.

[14] Robinson, G.R., Jr., Hammarstrom, J.M., and Olson, D.W., 2017, Graphite, chap. J of Schulz, K.J., DeYoung, J.H., Jr., Seal, R.R., II, and Bradley, D.C., eds., Critical mineral resources of the United States—Economic and environmental geology and prospects for future supply: U.S. Geological Survey Professional Paper 1802, p. J1– J24, https://doi.org/10.3133/pp1802J.

Figure A2.3.1. Graphite Production Supply Chain



The next step involves the micronizing of flake graphite by reducing it in size to 10–20 micron particles (for reference, a human hair is about 70 microns in diameter). This is done in a step by-step process as the flakes move through a cascading series of mills. They are crushed by impact, collision, friction, and shearing using a high-speed rotating plate and classified to separate the target size range, which then goes into the next mill. Micronized and rounded material is then chemically purified to produce graphite with even higher TGC levels, from approximately 95% TGC to 99.9% TGC.[15] During this process approximately two-thirds of the graphite contained in the ore is rejected as waste.

Processes that would limit environmental impacts and energy intensity are being developed but are not currently in commercial use. Additionally, the processes utilize significant amounts of petroleum and coal tar binder pitch during the forming process and impregnation pitch for the densification of baked carbon bodies.

The process for production of synthetic graphite involves introduction of petroleum coke to calcination followed by grinding and mixing, shaping and carbonization, graphitization, and coating to produce spherical graphite. The graphitization cycle (i.e., the last step before the final product) is the most significant manufacturing process. During this step, the preprocessed needle coke is heated to temperatures of almost 3,000 degrees Celsius. Graphitization takes place in purpose-built furnaces to withstand the extreme heat required for this process. The main purpose of this step is to convert the carbon in the needle coke into graphite. Graphitization removes impurities from the needle coke feedstock, further improving its total graphite content (TGC) and strengthening its structure.[16]

IRMA CoC Standard Normative Requirements for graphite are as follows:

1.1 Individual IRMA mine production including concentration as indicated by **(1)** shall form the basis of the IRMA-audited claim in terms of achievement level and quantity of graphite produced achieving that level. The supply chain data should show the achievement level, quantity of graphite concentrate produced, percent TGC and total quantity of TGC, for each individual IRMA source mine.

1.2 Non-IRMA mine production including concentration as indicated by **(2)** that is mixed into downstream processing feedstock shall also be accounted for in terms of quantity of concentrate, percent TGC and total quantity of TGC. The supply chain data does not need to provide the information for each individual non-IRMA mine but can agglomerate the information so long as the individual mine sources are identified.

1.3 Downstream processing losses of TGC as indicated by **(3)** do count against an IRMA claim and must be consistent with mass balance accounting of those losses.

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[15] The chemicals used in this step are typically hydrofluoric and sulfuric acid. The use of acids such as HF is one of the reasons why almost all of today's spheroidized coated graphite is produced in China.

[16] Amrish Ritoe, Irina Patrahau, Michel Rademaker, *Graphite Supply Chain Challenges and Recommendations for a Critical Mineral,* The Hague Centre for Strategic Studies, March 2022.

1.4 Downstream addition of TGC such as from the addition of pitch should be accounted for in final products and IRMA claims should be diluted accordingly consistent with mass balance accounting practices.

1.5 Spherical graphite as indicated by **(4)** and other graphite products produced and sold, traded, brokered, or warehoused, and delivered to fabricators, should show the achievement level, quantity and TGC contents for the involved IRMA-audited metals.

1.4 If products are not ready for fabrication, but require additional processing, for example by a toll facility, for an IRMA claim on those materials to be made, if they are mixed with other materials in the toll facility, the claim would have to be diluted by the total inputs to the tolling facility. The Entity producing the materials could only make an IRMA claim by acknowledging the further dilution.

1.6 Graphite used in fabrication, as indicated by **(5)** and delivered to end product users, should show the IRMA achievement level, quantity, and TGC contents received from fabricators and delivered to Consumers.

1.7 Internal process recycling should be accounted for as per IRMA Standard CoC Normative Guidance Section 6. Recycled Materials. To retain an IRMA claim the recycled material must report back to the smelting or refining facility of origin and be accounted as part of later production.

1.8 Consumer recycling should be accounted for as per IRMA Standard CoC Normative Guidance Section 6. Recycled Materials. While there is no IRMA claim for consumer recycled materials, the percentage content of consumer recycled materials should be accounted for and added as an addition to the IRMA claim (e.g., the graphite used in this battery anode consists of 25% IRMA 75 achievement level material and 25% post-consumer recycled material.)

4. Iron

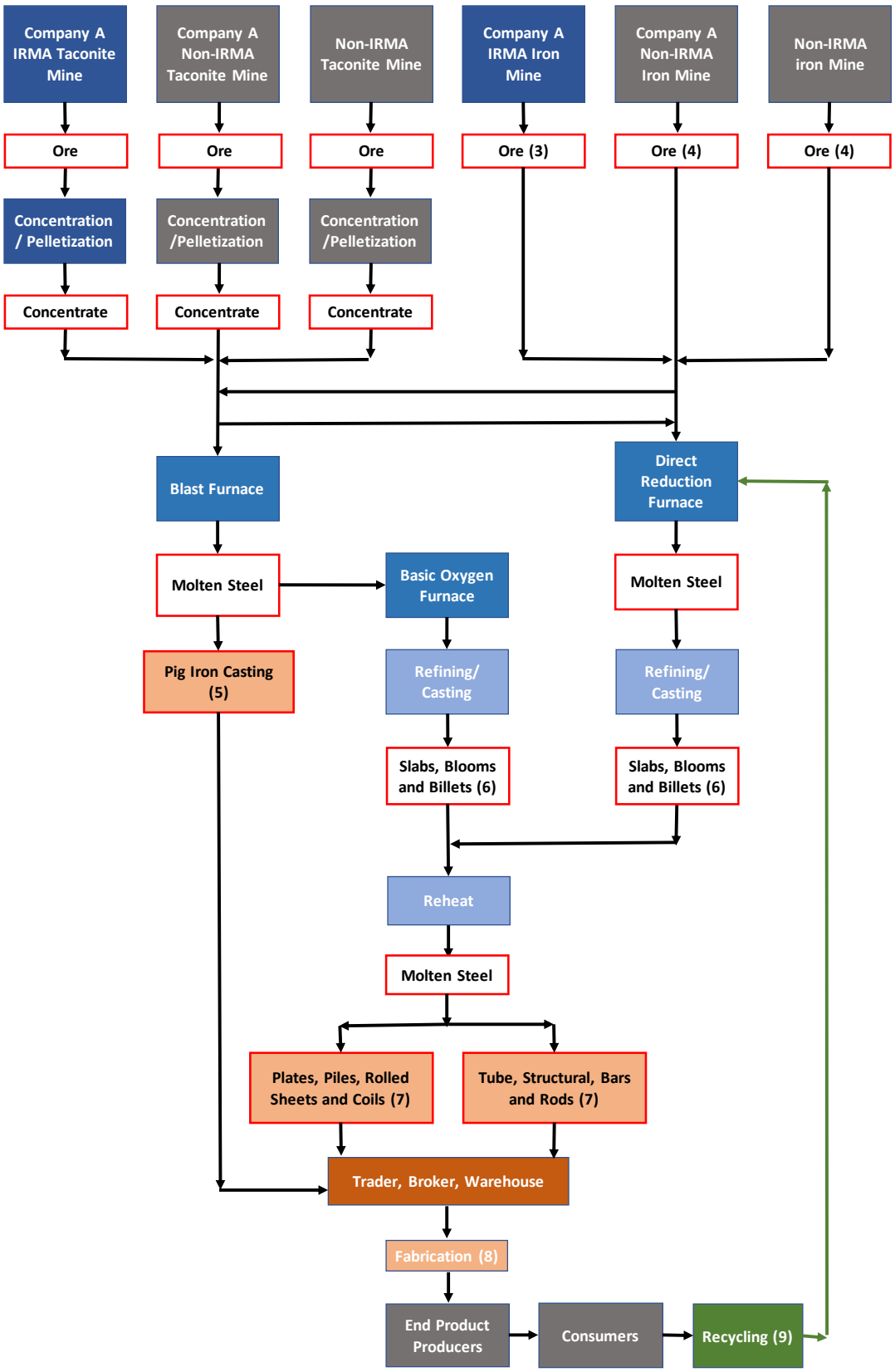
Iron ore is a mineral substance which, when heated in the presence of a reductant, will yield metallic iron (Fe). It almost always consists of iron oxides, the primary forms of which are magnetite (Fe_3O_4) and hematite (Fe_2O_3). Iron ore is the source of primary iron for the world's iron and steel industries. Almost all (98%) iron ore is used in steelmaking. Iron ore is mined in about 50 countries. Australia and Brazil together dominate the world's iron ore exports, each having about one-third of total exports.

The processes for producing iron from mine to end use are shown in Figure A2.4.1. The processes shown are not intended to be exhaustive but instead intended to be typical and for the purpose of explaining the flow of IRMA-audited iron given current industry practice.

Iron is mined to produce ore from both open pit and underground mine operations. Direct shipping ores, which are not concentrated, are transported as mined or after screening. Direct shipping ores are generally hematite, magnetite, or goethite. Lower-grade ores, such as from taconite deposits, require further processing. Processing of taconite consists of crushing and grinding the ore to liberate iron-bearing particles, concentrating the ore by separating the particles from the waste material (gangue), and pelletizing the iron ore concentrate. Concentration of magnetite uses magnetic separation techniques whereas non-magnetic hematite is concentrated by froth flotation. Various combinations of magnetic separation and flotation may be used to concentrate ores containing various iron minerals (magnetite and hematite, or maghemite) and wide ranges of mineral grain sizes. Flotation is also often used as a final polishing operation on magnetic concentrates. In pelletizing, moistened concentrates are fed to a rotating drum or an inclined disc, the tumbling action of which produces soft, spherical agglomerates. These “green” balls are then dried and hardened by firing in air to a temperature in the range of 1,250˚ to 1,340˚ C (2,300˚ to 2,440˚ F). Finally, they are slowly cooled. Finished pellets are round and have diameters of 10 to 15 millimeters, making them the ideal shape for the blast furnace.

Steel production from iron ore can occur using one of two processes. The traditional blast furnace produces pig iron from iron ore by the reducing action of carbon (supplied as coke) at an elevated temperature in the presence of a fluxing agent such as limestone. The direct reduction electric arc furnace approach is used to reduce iron from iron ore. Heat is generated from an electric arc between electrodes. Oxygen is blown into the furnace, and lime and other materials are added to combine with the impurities and form slag. Molten iron is extracted and poured out via a tapping spout. It is then processed again in an electric arc furnace to make steel—particularly special quality steel. It is then processed again in an electric arc furnace to make steel—particularly special quality steel.

Figure A2.4.1. Iron-Steel Production Supply Chain



Next, the molten steel is poured and solidified in a continuous caster. This produces semi-finished products. These can be either slabs, which have a rectangular cross-section, blooms, or billets, which have a square cross-section.

Lastly, these blank products are used to form a finished product. Depending on the geometry required, some will need to undergo heat treatment to achieve particular mechanical properties.

IRMA CoC Standard Normative Requirements for iron are as follows:

2.1 Individual IRMA mine production including from taconite mines following concentration, as indicated by **(1)** and from direct shipping mines **(3)** shall form the basis of the IRMA-audited claim in terms of achievement level and quantity of iron produced achieving that level. The supply chain data should show the achievement level and quantity of iron for each individual IRMA mine.

2.2 Non-IRMA mine production including from taconite mines or direct shipping mines by the same Entity that would be fed to smelting facilities is indicated by **(2)** and **(4)**. The supply chain data does not need to show the quantity of nickel for each individual non-IRMA mine but can agglomerate the total so long as the individual mine sources are identified.

2.3 Output from smelting and refining in the form of pig iron casting **(5)**, and slabs, blooms, and billets **(6)** shall be tracked to downstream reheating and their production of various shapes and indicated by **(7)** that are then used in fabrication as indicated.

2.4 If products are not ready for fabrication, but require additional processing, for example by a toll facility, for an IRMA claim on those materials to be made, if they are mixed with other materials in the toll facility, the claim would have to be diluted by the total inputs to the tolling facility. The Entity producing the materials could only make an IRMA claim by acknowledging the further dilution.

2.5 Smelting and refining conversion losses do count against an IRMA claim and must be consistent with mass balance accounting of those losses.

2.6 Individual iron and iron compounds produced and sold, traded, brokered, or warehoused, and delivered to fabricators, should show the achievement level and quantity for the involved IRMA-audited metal.

2.7 Individual metals or materials used in fabrication, as indicated by **(8)** and delivered to end product users, should show the IRMA achievement level and quantity of iron received from fabricators and delivered to Consumers.

2.8 Internal process recycling should be accounted for as per IRMA Standard CoC Normative Guidance Section 6. Recycled Materials. In order to retain an IRMA claim the recycled material must report back to the processing facility of origin and be accounted as part of later production.

2.9 Consumer recycling as indicated by **(9)** should be accounted for as per IRMA Standard CoC Normative Guidance Section 6. Recycled Materials. While there is no IRMA claim for consumer recycled materials, the percentage content of consumer recycled materials should be accounted for and added as an addition to the IRMA claim (e.g., The iron used in this battery consists of 25% IRMA 75 achievement level material and 50% post-consumer recycled material).

5. Lithium

Lithium, the lightest of all metals, is used in batteries (rechargeable and primary), ceramics, glass, lubricants, metallurgy, air treatment, pharmaceuticals, and polymers. Rechargeable lithium-ion batteries are particularly important in efforts to reduce global warming at both the EV and industrial scale.

Currently, lithium is extracted from brines that are pumped from beneath arid sedimentary basins and extracted from granitic pegmatite ores. The leading producer of lithium from brine is Chile, and the leading producer of lithium from pegmatites is Australia. Other potential sources of lithium include clays, geothermal brines, oilfield brines, and zeolites.

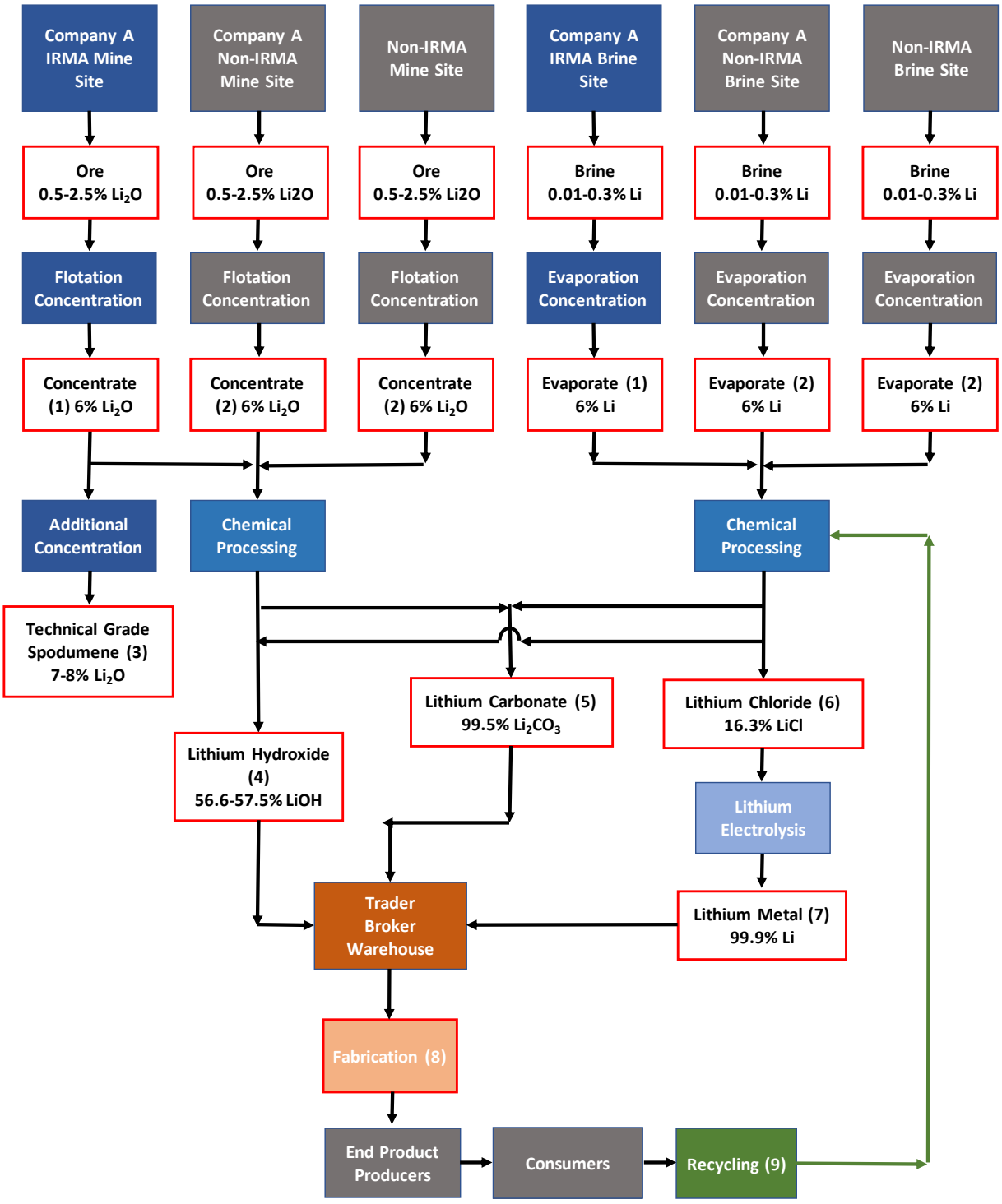
Lithium is traded in three forms: mineral concentrates, mineral compounds, and refined metal. Lithium minerals—spodumene, petalite, and lepidolite—are mined from pegmatites and are used mostly as feedstock for glasses and ceramics. Most lithium compounds (for example, lithium carbonate, lithium chloride, and lithium hydroxide) are obtained from brines. Lithium metal is obtained by electrolysis from lithium chloride.

The processes for producing lithium from mine sites, including brine extraction sites, to end use are shown in Figure A2.5.1. The processes shown are not intended to be exhaustive but instead intended to be typical and for the purpose of explaining the flow of IRMA-audited lithium given current industry practice with an emphasis on chain of supply for decarbonization purposes such as energy storage batteries.

Ore from lithium containing pegmatites (LCTs) is extracted from open pit hardrock mines followed by concentration by flotation and in some cases other methods. The resulting concentrate, containing approximately 6% lithium oxide (Li_2O), is then transported for chemical processing into lithium hydroxide (LiOH) or lithium carbonate ($Li_2CO_{3)}$. Technical grade spodumene may also be produced using additional concentration processes resulting in 7-8% lithium oxide. Processes vary, but typically lithium concentrate is heated and pulverized and then mixed with sulfuric acid. The slurry is heated, filtered, and concentrated through evaporation processes to form lithium hydroxide or lithium carbonate.

Lithium containing brine is extracted from wells where it is pumped to the surface and distributed to evaporation ponds of various ages. The natural evaporation process can take months or years and results in a concentrated brine or “evaporate” containing approximately 6% lithium. The liquid concentrate is transported for chemical processing into lithium hydroxide, lithium carbonate, or lithium chloride. The chemical processes used typically include the following steps: pre-treatment using filtration or ion exchange to remove unwanted constituents from the brine; chemical treatment including solvent extraction and precipitation to separate products and byproducts; filtration to remove precipitated solids; and chemical treatment to form lithium hydroxide, lithium carbonate, lithium chloride

Figure A2.5.1. Lithium Production Supply Chain



and other lithium compounds. Lithium chloride is converted by electrolysis to metal resulting in 99.9% lithium.

IRMA CoC Standard Normative Requirements for lithium are as follows:

3.1 Individual IRMA mine production including from brine operations and concentration or evaporation, as indicated by **(1)** shall form the basis of the IRMA-audited claim in terms of achievement level and quantity of lithium produced achieving that level. The supply chain data should show the achievement level and quantity of lithium for each individual IRMA mine. Non-typical production sources of lithium such as from hardrock clay or direct lithium extraction would be similarly addressed.

3.2 Non-IRMA mine production including brine operations and concentration or evaporation by the same Entity that would be fed to chemical processing and lithium conversion facilities is indicated by **(2)**. The supply chain data does not need to show the quantity of lithium for each individual non-IRMA mine but can agglomerate the total so long as the individual mine sources are identified.

3.3 Lithium compounds and metal produced from chemical processing and lithium conversion as indicated by **(3)** through **(7)** should show the achievement level and quantity of lithium for the agglomerated IRMA-audited metals. Mass balance accounting for conversion should be consistent with Table A2.5. 1.

3.4 If products are not ready for fabrication, but require additional processing, for example by a toll facility, for an IRMA claim on those materials to be made, if they are mixed with other materials in the toll facility, the claim would have to be diluted by the total inputs to the tolling facility. The Entity producing the materials could only make an IRMA claim by acknowledging the further dilution.

3.5 Chemical processing and lithium conversion losses do count against an IRMA claim and must be consistent with mass balance accounting of those losses.

3.6 Individual lithium and lithium compounds produced and sold, traded, brokered, or warehoused, and delivered to fabricators, should show the achievement level and quantity for the involved IRMA-audited metal.

3.7 Individual metals or materials used in fabrication, as indicated by **(8)** and delivered to end product users, should show the IRMA achievement level and quantity of lithium received from fabricators and delivered to Consumers.

3.8 Internal process recycling should be accounted for as per IRMA Standard CoC Normative Guidance Section 6. Recycled Materials. In order to retain an IRMA claim the recycled material must report back to the processing facility of origin and be accounted as part of later production.

3.9 Consumer recycling as indicated by **(9)** should be accounted for as per IRMA Standard CoC Normative Guidance Section 6. Recycled Materials. While there is no IRMA claim for consumer recycled materials, the percentage content of consumer recycled materials should be accounted for and added as an addition to the IRMA

claim (e.g., The lithium used in this battery consists of 25% IRMA 75 achievement level material and 50% post-consumer recycled material.)

Standard industry terminology may be used including Lithium Carbonate Equivalent (LCE) provided the following conversion factors are utilized:

Table A2.5.1. Conversion Factors for Lithium Compounds and Minerals

CONVERT FROM	CONVERT TO				
	LITHIUM METAL (Li)	LITHIUM HYDROXIDE MONOHYDRATE ($LiOH.H_2O$)	LITHIUM CARBONATE (Li_2CO_3)	LITHIUM CHLORIDE (LiCl)	CHEMICAL GRADE SPODUMENE (7% Li)
Lithium Metal (Li)	1.000	6.047	5.324	6.108	14.286
Lithium Hydroxide Monohydrate ($LiOH.H_2O$)	0.165	1.000	0.880	1.010	2.363
Lithium Carbonate (Li_2CO_3)	0.188	1.136	1.000	1.147	2.683
Lithium Chloride (LiCl)	0.164	0.990	0.872	1.000	2.339
Technical Grade Spodumene (7% Li)	0.070	0.423	0.373	0.428	1.000

6. Nickel

Nickel is primarily sold for first use as refined metal (cathode, powder, and briquet) or ferronickel. About 65% of the nickel consumed in the Western World is used to make austenitic stainless steel. Another 12% goes into superalloys (e.g., Inconel 600) or nonferrous alloys (e.g., cupronickel). Both families of alloys are widely used because of their corrosion resistance. The aerospace industry is a leading consumer of nickel-based superalloys. Turbine blades, discs and other critical parts of jet engines are fabricated from superalloys. Nickel-base superalloys are also used in land-based combustion turbines, such those found at electric power generation stations. The remaining 23% of consumption is divided between alloy steels, rechargeable batteries, catalysts and other chemicals, coinage, foundry products, and plating. The principal commercial chemicals are the carbonate ($NiCO_3$), chloride ($NiCl_2$), divalent oxide (NiO), and sulfate ($NiSO_4$).[17]

Primary nickel is produced from two very different ores, sulfides and lateritic. Sulfide ores are often found in conjunction with copper-bearing ores and may be mined by underground or open pit methods. Lateritic ores are normally found in tropical climates where weathering, with time, extracts and deposits the ore in layers at varying depths below the surface. Lateritic ores are mined by open pit methods. The processes for producing nickel from mine site to end use are shown in Figure A2.6.1.[18,19] The processes shown are not intended to be exhaustive but instead intended to be typical and for the purpose of explaining the likely flow of IRMA-audited nickel given current industry practice with an emphasis on chain of supply for decarbonization purposes such as energy storage batteries.

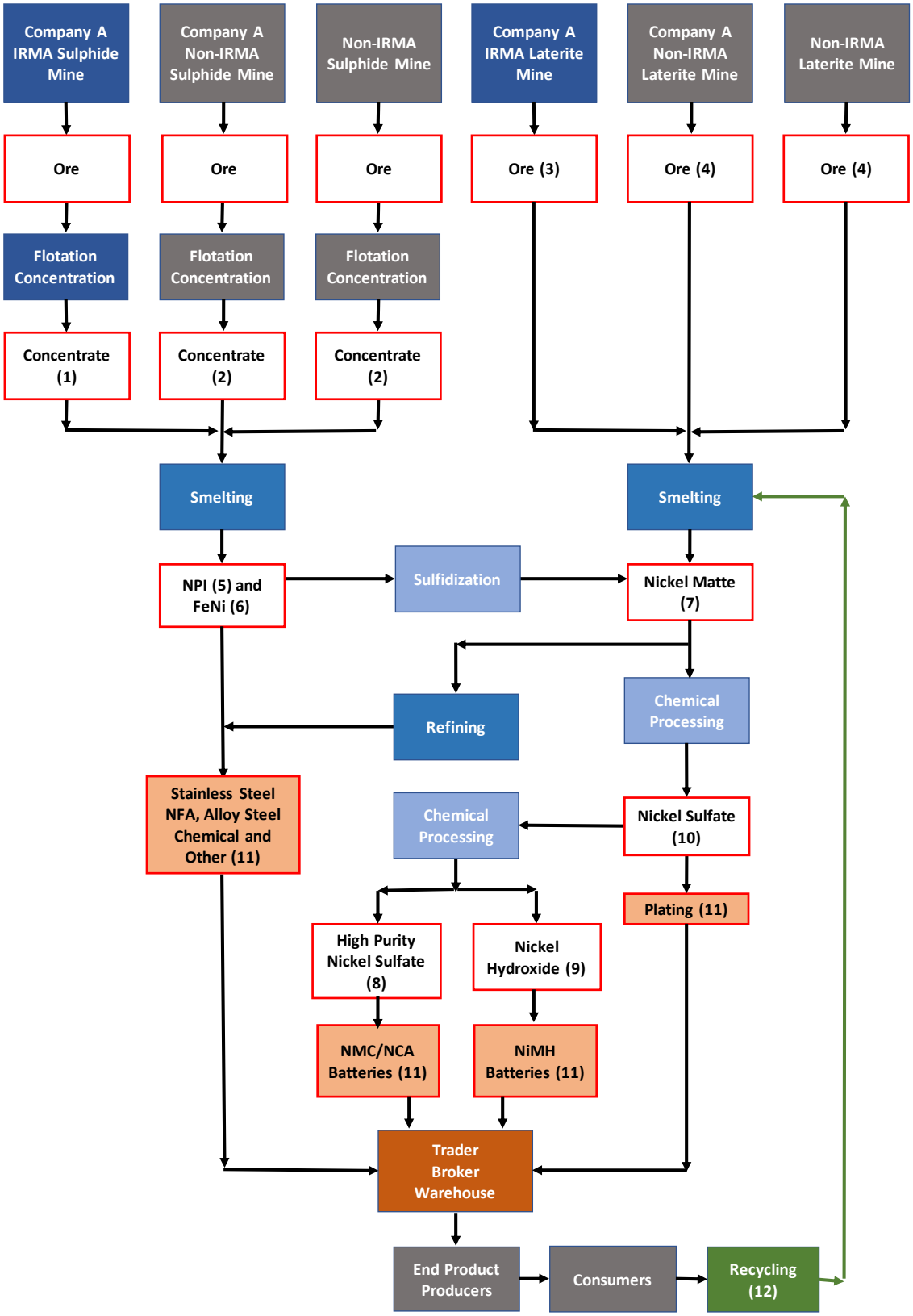
Sulfidic Ore Processing. Nickel sulfide ore from open pit or underground mining is typically upgraded by froth flotation to form a high-grade nickel concentrate. The concentrate is dried and then fed to Flash the smelting process. Flash smelting is the most common process for smelting, but electric smelting is also used for more complex raw materials. Electric smelting requires a roasting step before smelting to reduce sulfur content and volatiles. Older nickel-smelting processes, such as blast or reverberatory furnaces, may also still be in use. In flash smelting, dry sulfide ore containing less than 1% moisture is fed to the furnace along with preheated air, oxygen-enriched air (30–40% oxygen), or pure oxygen. Iron and sulfur are oxidized. The heat that results from exothermic reactions is adequate to smelt concentrate, producing a liquid matte (up to 45% nickel) and a fluid slag.

[17] https://www.usgs.gov/centers/national-minerals-information-center/nickel-statistics-and-information

[18] https://www.crugroup.com/knowledge-and-insights/case-studies/2019/understanding-costs-of-new-nickel-sulphate-supply-in-south-east-asia/

[19] Source Extractive Metallurgy of Nickel, Cobalt and Platinum Group Metals, Editor(s): Frank K. Crundwell, Michael S. Moats, Venkoba Ramachandran, Timothy G. Robinson, William G. Davenport, El Sevier, 2011. ISBN 9780080968094, https://doi.org/10.1016/B978-0-08-096809-4.10012-7.

Figure A2.6.1. Nickel Production Supply Chain



Furnace matte still contains iron and sulfur, and these are oxidized in the converting step to sulfur dioxide and iron oxide by injecting air or oxygen into the molten bath. Oxides form a slag, which is skimmed off. Slags are processed in an electric furnace prior to discard to recover nickel. Process gases are cooled, and particulates are then removed by gas-cleaning devices.

The process results in the production of Ferro Nickel (FeNi) and/or Nickel Pig Iron (NPI) which is a low-grade ferronickel invented in China as a cheaper alternative to pure nickel to produce stainless steel. These products are typically used to produce stainless steel, nickel ferro alloys (NFA), alloy steel, chemical and other products. More recently, these products are being subjected to sulfidation and converted to Nickel Matte which is then used downstream to produce nickel sulfate as an alternative to nickel sourced from laterite ores.

Lateritic Ore Processing. Nickel laterite ores have a high percentage of free and combined moisture, which must be removed. Drying removes free moisture; chemically bound water is removed by a reduction furnace, which also reduces the nickel oxide. Lateritic ores have no significant fuel value, and an electric furnace is needed to obtain the elevated temperatures required to accommodate the high magnesia content of the ore. Some laterite smelters add sulfur to the furnace to produce a matte for processing. Most laterite nickel processers run the furnaces to reduce the iron content sufficiently to produce ferronickel products. Hydrometallurgical processes based on ammonia or sulfuric acid leach are also used. Ammonia leach is usually applied to the ore after the reduction roast step.

Nickel Refining. Various processes are used to refine nickel matte. Fluid bed roasting and chlorine-hydrogen reduction produce high-grade nickel oxides (more than 95% nickel). Vapor processes such as the carbonyl process can be used to produce high-purity nickel pellets. In this process, copper and precious metals remain as a pyrophoric residue that requires separate treatment. The use of electrical cells equipped with inert cathodes is the most common technology for nickel refining. Electrowinning, in which nickel is removed from solution in cells equipped with inert anodes, is the more common refining process. Sulfuric acid solutions or, less commonly, chloride electrolytes are used.

Nickel Matte Conversion to Nickel Sulfate. Nickel Matte from smelting or from other sources is leached with sulfuric acid to form nickel sulfate, which is then used for plating, or is further chemically processed to produced high purity nickel sulfate, which is used in the manufacture of nickel-manganese-cobalt (NMC) and lithium-manganese-aluminum (NMA) batteries. Alternatively, nickel sulfate is converted to nickel hydroxide which is used in the manufacture of nickel-metal-hydride (NiMH) batteries.

IRMA CoC Standard Normative Requirements for nickel are as follows:

4.1 Individual IRMA mine production including from sulfide mines following concentration, as indicated by **(1)** and from laterite mines **(3)** shall form the basis of the IRMA-audited claim in terms of achievement level and quantity of nickel produced achieving that level. The supply chain data should show the achievement level and quantity of nickel for each individual IRMA mine. Non-typical production sources of nickel such as from hydrometallurgical extraction should be similarly identified.

4.2 Non-IRMA mine production including from sulfide mines or laterite mines by the same Entity that would be fed to smelting facilities is indicated by **(2)** and **(4)**. The supply chain data does not need to show the quantity of nickel for each individual non-IRMA mine but can agglomerate the total so long as the individual mine sources are identified.

4.3 Output from smelting in the form of NPI, FeNi, and nickel matte as indicated by **(5)**, **(6)** and **(7)** respectively shall be tracked to downstream processes and their production of high purity nickel sulfate **(8)**, nickel hydroxide **(9)** and nickel sulfate **(10)** and to their final use in fabrication as indicated.

4.4 If products are not ready for fabrication, but require additional processing, for example by a toll facility, for an IRMA claim on those materials to be made, if they are mixed with other materials in the toll facility, the claim would have to be diluted by the total inputs to the tolling facility. The Entity producing the materials could only make an IRMA claim by acknowledging the further dilution.

4.5 Smelting, refining, and chemical processing and conversion losses do count against an IRMA claim and must be consistent with mass balance accounting of those losses.

4.6 Individual nickel and nickel compounds produced and sold, traded, brokered, or warehoused, and delivered to fabricators, should show the achievement level and quantity for the involved IRMA-audited metal.

4.7 Individual metals or materials used in fabrication, as indicated by **(11)** and delivered to end product users, should show the IRMA achievement level and quantity of nickel received from fabricators and delivered to Consumers.

4.8 Internal process recycling should be accounted for as per IRMA Standard CoC Normative Guidance Section 6. Recycled Materials. In order to retain an IRMA claim the recycled material must report back to the processing facility of origin and be accounted as part of later production.

4.9 Consumer recycling as indicated by **(12)** should be accounted for as per IRMA Standard CoC Normative Guidance Section 6. Recycled Materials. While there is no IRMA claim for consumer recycled materials, the percentage content of consumer recycled materials should be accounted for and added as an addition to the IRMA claim (e.g., The nickel used in this battery consists of 25% IRMA 75 achievement level material and 50% post-consumer recycled material).

7. Platinum Group Metals

The platinum group metals (PGMs) or elements (PGEs) are platinum (Pt), palladium (Pd), ruthenium (Ru), rhodium (Rh), iridium (Ir) and osmium (Os). The leading use for PGMs is in catalytic converters to decrease harmful emissions from forms of transportation that use combustion engines including automobiles, trucks, and heavy equipment. PGMs are also used in catalysts for bulk-chemical production and petroleum refining; dental and medical devices; electronic applications, such as in computer hard disks, hybridized integrated circuits, and multilayer ceramic capacitors; glass manufacturing; investment; jewelry; and laboratory equipment.[20]

PGMs are not currently viewed as a key green energy mineral resource. However, PGMs are considered to be a critical mineral by the U.S. Geological Survey, noting that PGMs are indispensable to many industrial applications but mined in a limited number of places and noting that the supply, because of the concentration of PGMs in a few locations globally, could be disrupted by economic, environmental, political, and social events.[21]

A generalized supply chain for PGMs is shown in Figure A2.7.1. The processes shown are not intended to be exhaustive but instead intended to be typical and for the purpose of explaining the flow of IRMA-audited PGMs given current industry practice.

The main source of minerals for PGMs are chromite and sulfide ores. The richest PGM containing orebodies are mined for PGMs as primary products and are based on mining ultramafic and mafic (e.g., geologically very old) igneous rocks which occur in Canada, Russia, South Africa, United States, and Zimbabwe. PGMs may also be produced as by-products or co-products of copper nickel mining, with examples being the Norilsk deposit in north-western Siberia, and the Sudbury deposit in Canada.[22]

PGM mining is performed via either open pit or underground mining at large scale. The ore extracted from PGM mine production contains PGM bearing sulfides and alloys. The typical first step in treatment used for all PGM production is concentration using froth flotation. PGM concentration facilities are typically located adjacent, or in proximity to, the mining operations.

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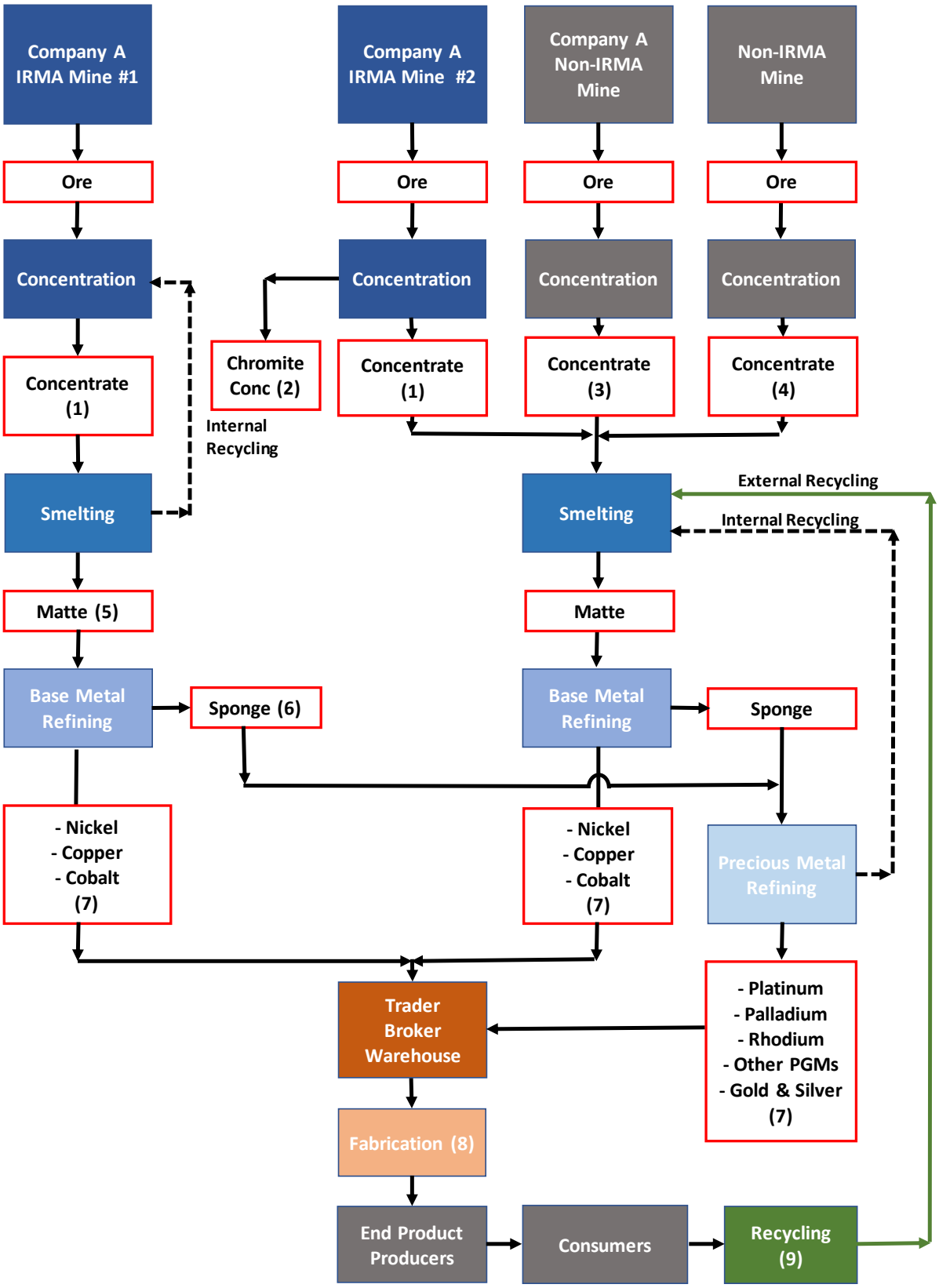
[20] Hughes, A.E.; Haque, N.;Northey, S.A.; Giddey, S. *Platinum Group Metals: A Review of Resources, Production and Usage with a Focus on Catalysts.* Resources 2021, 10, 93.
[21] USGS Mineral Commodity Summary 2022 – Platinum Group Metals.
[22] Zientek, M.L., Loferski, P.J., Parks, H.L., Schulte, R.F., and Seal, R.R., II, 2017, *Platinum-group elements*, Chapter N of Schulz, K.J., DeYoung, J.H., Jr., Seal, R.R., II, and Bradley, D.C., eds., Critical Mineral Resources of the United States—Economic and Environmental Geology and Prospects for Future Supply: U.S. Geological Survey Professional Paper 1802, p. N1–N91.

Figure A2.7.1. PGM Production Supply Chain



The concentrate from flotation is then treated by smelting which is conducted to oxidize the sulfides and remove other impurities from the concentrate, and produce a base metal, PGM and precious metal rich matte. The smelting process is highly similar whether the PGMs are produced as primary products or as by-products.

PGMs containing materials from recycling, which are typically sourced from automobile exhaust catalytic converters, are introduced during the smelting process. This may be one of the best examples of recycling of commodities in that the catalytic converters for automobiles are easily identifiable and external to the car itself, making them easily recoverable (and subject to theft). The metal is contained and of high value, the material is easily extracted, and is highly amenable to introduction to conventional smelting processes already used for primary PGM production.

The next step, refining of individual PGMs, requires highly complex metallurgical and chemical processes and therefore is only performed by a limited number of facilities worldwide. PGM refining consists of two steps. The first is base metal refining which typically uses a hydrometallurgical autoclave leaching process to sequentially leach nickel, copper, and cobalt along with other impurities and produce a final concentrate or "sponge" that contains PGMs and gold. The base metals are produced individually in either metal or chemical form. In the next step the metal sponge is refined and separated into individual PGMs using organic solvents, ion exchange and electrolytic processes or other methods. Refining of base metals is sometimes performed in sequence with and at the same site as smelting, however at other sites both refining of base metals and PGMs takes place at the same facility. Most primary PGM refineries are owned by primary PGM mining producers, however there are others which are independent from the PGM mining companies and may also be involved in product fabrication.

The last step before the end use of PGMs as auto catalysts is product fabrication, where the individual PGMs are combined and formed into a catalyst which is then enveloped by a container producing a "catalytic converter" that can then be easily installed as an end product by a combustion engine vehicle manufacturer.

IRMA CoC Standard Normative Requirements for PGMs are as follows:

5.1 Individual IRMA mine production including concentration, as indicated by **(1)** shall form the basis of the IRMA-audited claim in terms of achievement level and quantity of metals or minerals produced achieving that level. The supply chain data should show the achievement level and quantity of metals or minerals for each individual IRMA mine.

5.2 If an IRMA mine produces chromite or another metal or mineral as a by-product from concentration, as indicated by **(2)** then that material can also be claimed as IRMA-audited.

5.3 Non-IRMA mine production including concentration by the same Entity that would be fed to common smelting and refining facilities is indicated by **(3)**. The supply chain data does not need to show the quantity of metals or minerals for each individual non-IRMA mine but can agglomerate the total so long as the individual mine sources are identified.

5.4 Non-IRMA mine production including concentration by an external Entity that would be tolled in an Entity's smelting and refining facilities is indicated by **(4)**. The supply chain data does not need to show the quantity of metals or minerals for each individual external mine but can agglomerate the total so long as the individual mine sources are identified.

5.5 If IRMA mine production is sent to a smelting facility owned by the Entity which then sends the product to another location owned by the same Entity for downstream refining, as indicated by **(5)** then the supply chain data does not need to show the transfer of metals between smelting and refining. However, if the Entity sends a downstream product to another Entity for downstream refining, as indicated by **(6)**, then the supply chain data does need to show the transfer of metals between smelting and refining.

5.6 Individual metals or materials produced from metallurgical processing as indicated by **(7)** should show the achievement level and quantity of metals or minerals for the agglomerated IRMA-audited metals.

5.7 If products are not ready for fabrication, but require additional processing, for example by a toll facility, for an IRMA claim on those materials to be made, if they are mixed with other materials in the toll facility, the claim would have to be diluted by the total inputs to the tolling facility. The Entity producing the materials could only make an IRMA claim by acknowledging the further dilution.

5.8 Smelting and refining losses do count against an IRMA claim and must be consistent with mass balance accounting of those losses.

5.9 Individual metals or materials produced and sold, traded, brokered, or warehoused, and delivered to fabricators, as indicated by **(8)** should show the achievement level and quantity of metals or minerals for the involved IRMA-audited metals.

5.10 Internal process recycling should be accounted for as per IRMA Standard CoC Normative Guidance Section 6. Recycled Materials. In order to retain an IRMA claim the recycled material must report back to the smelting or refining facility of origin and be accounted as part of later production.

5.11 Consumer recycling as indicated by **(9)** should be accounted for as per IRMA Standard CoC Normative Guidance Section 6. Recycled Materials. While there is no IRMA claim for consumer recycled materials, the percentage content of consumer recycled materials should be accounted for and added as an addition to the IRMA claim (e.g., The palladium used in this catalytic converter consists of 25% IRMA 75 achievement level material and 50% post-consumer recycled material.)

8. Titanium

The primary use of titanium is as a pigment that provides white color to paint, paper, plastics, rubber, wallboard, and other materials. A minor amount of titanium (less than 5%) is used in the production of titanium metal and alloys used in the aerospace industry and other applications. It does not have specific carbon-neutral applications but is considered a strategic mineral commodity.

Global production of titanium in the form of titanium dioxide (TiO_2) in 2023 was estimated as 9,200,000 tonnes.[23] Titanium is produced from both hardrock and mineral sands sources. Because the bulk of the titanium used is for pigments and cannot be recovered with current methods even though titanium metal is recycled, recycling is not significant in terms of overall production.[24]

The steps in the titanium supply chain from mine to end user are shown in Figure A2.8.1. The processes shown are not intended to be exhaustive but are typical of the current commodity supply chain and intended for the purpose of explaining the flow of IRMA-audited titanium given current industry practice.

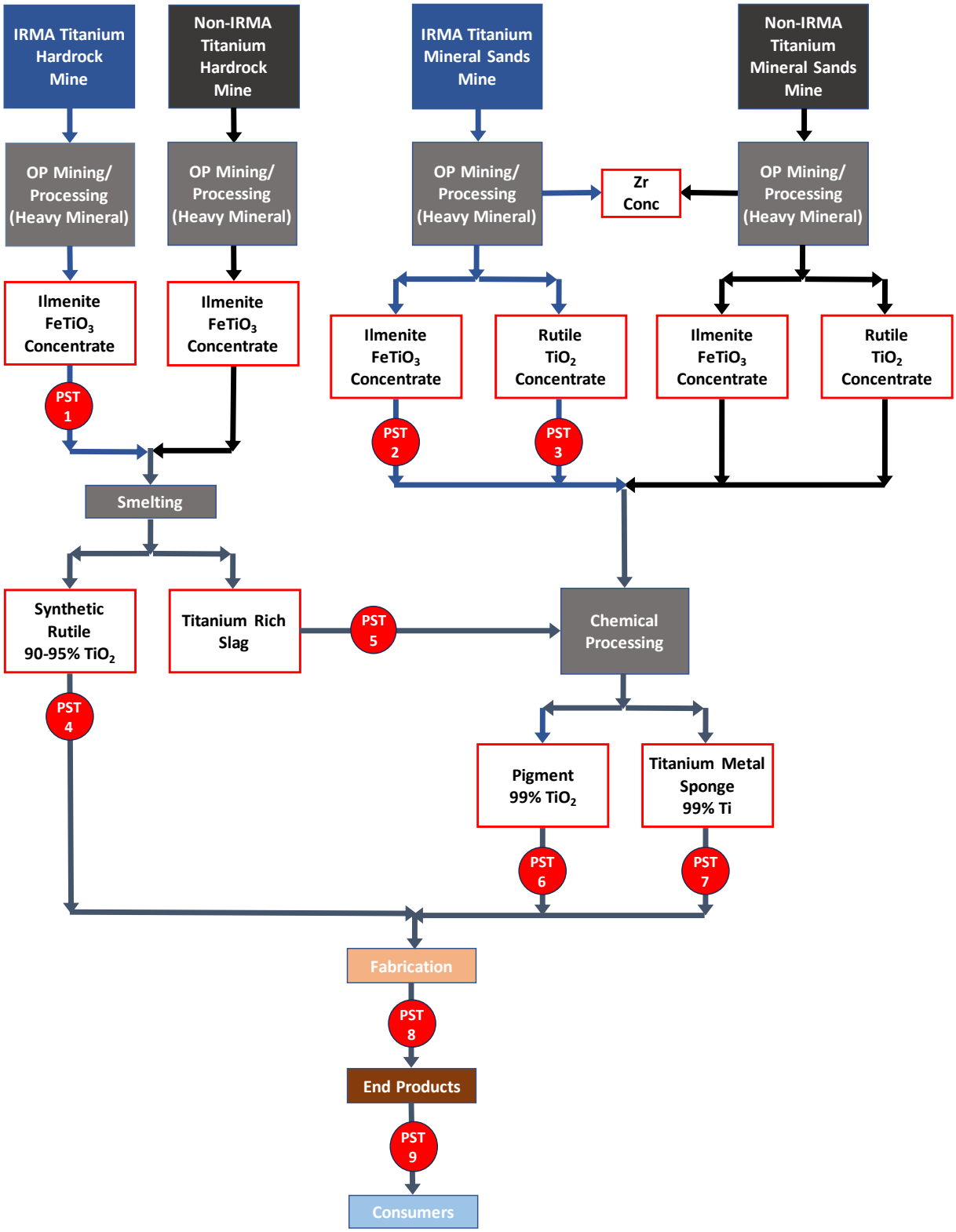
Titanium hardrock ore is mined by open pit mining methods. The mined ore is crushed, ground, and processed by heavy minerals beneficiation processes to produce an ilmenite ($FeTiO_3$) concentrate. The Ilmenite concentrate is sold and/or transferred to a smelter to produce synthetic rutile contain 90-95% TiO_2 and a titanium rich slag. The synthetic rutile is then sold and/or transferred to be further used in downstream fabrication and the titanium rich slag is further processed by chemical methods.

Titanium mineral sands are mined using open pit and dredging methods. The mined ore processed by heavy minerals beneficiation processes to produce both ilmenite and rutile concentrate. Both concentrates are then sold and/or transferred for chemical processing and then further used in downstream fabrication.

Titanium pigment is sourced to fabricators and manufacturers of paint, paper, plastics, rubber, wallboard, and other materials. Synthetic rutile and titanium metal sponge are similarly distributed to various fabricator and manufacturers. These products are then sold and/or transferred to be used in the manufacture of end-use products.

[23] USGS 2024. https://pubs.usgs.gov/periodicals/mcs2024/mcs2024-titanium-minerals.pdf
[24] Ibid.

Figure A2.8.1. Titanium Production Supply Chain



IRMA CoC Standard Normative Requirements for titanium are as follows:

4.1 Individual IRMA mine site production of titanium from hardrock mines following concentration as ilmenite, as indicated by **PST 1** and from mineral sands mines following concentration as ilmenite as indicated by **PST 2** and rutile as indicated by **PST 3** shall form the basis of the IRMA-audited claim in terms of achievement level and quantity of titanium produced achieving that level. The supply chain data should show the achievement level and quantity of titanium as metal for each individual IRMA mine.

4.2 IRMA mine production from titanium hardrock mines is sold and/or transferred and then combined with non-IRMA mine production and fed to smelting facilities. The supply chain data does not need to include the individual non-IRMA mine sources but does need to identify the agglomerated percentage of non-IRMA mine site production in the synthetic rutile sold and/or transferred as indicated by **PST 4** and the titanium rich slag as indicated by **PST 5**.

4.3 IRMA mine production from titanium smelting in the form of titanium rich slag is sold and/or transferred and then combined with IRMA and Non-IRMA mine production from mineral sands mines and fed to chemical processing facilities. The supply chain data does not need to include the individual non-IRMA mine sources but does need to identify the agglomerated percentage of non-IRMA mine site production in the pigment and sponge metal sold and/or transferred as indicated by respectively by **PST 6** and **PST 7**.

4.4 If products are not ready for fabrication, but require additional processing, for example by a toll facility, for an IRMA claim on those materials to be made, if they are mixed with other materials in the toll facility, the claim would have to be diluted by the total inputs to the tolling facility. The Entity producing the materials could only make an IRMA claim by acknowledging the further dilution.

4.5 Smelting and other processing and conversion losses do count against an IRMA claim and must be consistent with the mass balance accounting of those losses.

4.6 Individual forms of titanium produced and sold and/or transferred to fabricators, should indicate the achievement level and contained percentage for the indicated IRMA-audited metal.

4.7 Individual forms of titanium from fabrication sold and/or transferred, as indicated by **PST 8** and delivered to end-product users, should show the IRMA achievement level and contained percentage of titanium received from fabricators. The same information should be provided with respect to the sale and/or transfer of end products delivered to Consumers as indicated by **PST 9.**

4.8 Internal process and consumer recycling should be accounted for as per IRMA Standard CoC Normative Guidance Section 6. Recycled Materials.

9. Zirconium

Zirconium is a corrosion-resistant metal that is widely used in the chemical and nuclear power industries. Zirconium's specific carbon-neutral applications are tied to nuclear power generation and zirconium is also considered a strategic mineral commodity.

Global production of zirconium in the form of mineral concentrates in 2023 was estimated as 1,600,000 tonnes.[25] Zirconium is produced from both hardrock and mineral sands sources. Less than 1% of zirconium is recycled or reused and the recycled content of products is likewise very low.[26]

The steps in the zirconium supply chain from mine to end user are shown in Figure A2.9.1. The processes shown are not intended to be exhaustive but are typical of the current commodity supply chain and intended for the purpose of explaining the flow of IRMA-audited titanium given current industry practice.

Zirconium hardrock ore is mined by open pit mining methods. The mined ore is crushed, ground, and processed by heavy minerals beneficiation processes to produce various grades of zircon concentrate:

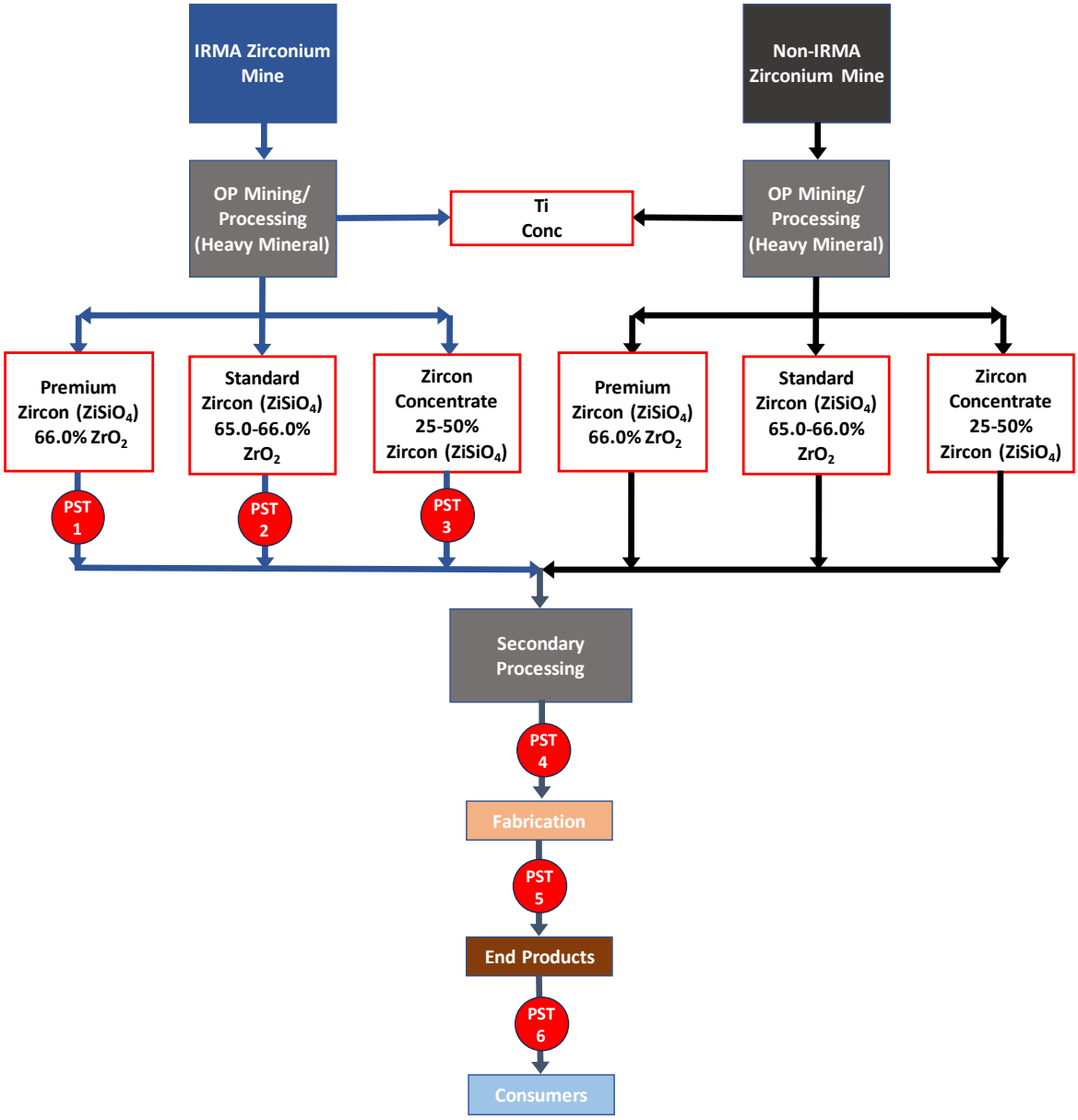
- Premium Zircon ($ZiSiO_4$) 66.0% ZrO_2
- Standard Zircon ($ZiSiO_4$) 65.0-66.0% ZrO_2
- Zircon Concentrate 25-50% Zircon ($ZiSiO_4$)

Similarly, the mined ore from mineral sands operations is processed by heavy mineral beneficiation processes to produce similar grades of concentrate.

The zircon concentrates are sold and/or transferred for downstream processing. The processed zirconium products are then sold and/or transferred to be further used in downstream fabrication. Zirconium products are sourced to fabricators and manufacturers of ceramics, chemicals, foundry sands, refractories, and materials. These products are then sold and/or transferred to be used in the manufacture of interim and end-use products.

[25] USGS 2024. https://pubs.usgs.gov/periodicals/mcs2024/mcs2024-titanium-minerals.pdf
[26] Jones, J.V., III, Piatak, N.M., and Bedinger, G.M., 2017, Zirconium and hafnium, chap. V of Schulz, K.J., DeYoung, J.H., Jr.,
Seal, R.R., II, and Bradley, D.C., eds., Critical mineral resources of the United States—Economic and environmental
geology and prospects for future supply: U.S. Geological Survey Professional Paper 1802, p. V1– V26, https://doi.org/
10.3133/pp1802V.

Figure A2.9.1. Zirconium Production Supply Chain



IRMA CoC Standard Normative Requirements for zirconium are as follows:

4.1 Individual IRMA mine site production of zirconium from hardrock and mineral sands mines following concentration as Premium Zircon, as indicated by **PST 1**, as Standard Zircon as indicated by **PST 2** and as Zircon Concentrate as indicated by **PST 3** shall form the basis of the IRMA-audited claim in terms of achievement level and quantity of zirconium produced achieving that level. The supply chain data should show the achievement level and quantity of zirconium as metal for each individual IRMA mine.

4.2 IRMA mine production from zirconium hardrock mines is sold and/or transferred and then combined with non-IRMA mine production and fed to secondary processing facilities. The supply chain data does not need to include the individual non-IRMA mine sources but does need to identify the agglomerated percentage of non-IRMA mine site production sold and/or transferred as indicated by **PST 4**.

4.3 If products are not ready for fabrication, but require additional processing, for example by a toll facility, for an IRMA claim on those materials to be made, if they are mixed with other materials in the toll facility, the claim would have to be diluted by the total inputs to the tolling facility. The Entity producing the materials could only make an IRMA claim by acknowledging the further dilution.

4.4 Smelting and other processing and conversion losses do count against an IRMA claim and must be consistent with the mass balance accounting of those losses.

4.5 Individual forms of zirconium produced and sold and/or transferred to fabricators, should indicate the achievement level and contained percentage for the indicated IRMA-audited metal.

4.7 Individual forms of zirconium from fabrication sold and/or transferred, as indicated by **PST 5** and delivered to end-product users, should show the IRMA achievement level and contained percentage of zirconium received from fabricators. The same information should be provided with respect to the sale and/or transfer of end products delivered to Consumers as indicated by **PST 6.**

4.8 Internal process and consumer recycling should be accounted for as per IRMA Standard CoC Normative Guidance Section 6. Recycled Materials.

Annex 3 – Claim Approval Requests

Information Required	Additional Description
Name of IRMA Member	
IRMA Member Contact	Name, position, email address
Other contact	Name, position, email address
Type of claim	For example, IRMA Membership, IRMA Standard mine site, or IRMA CoC product- related.
Type and/or description of Product(s)	Types of metal/mineral or semi-product or component or final product.
Single or related Products	Identify whether this is for a single type of material and product, or a group of related materials and product that are under a common management system. If it is neither of these, there is an option to give further information
Proposed claim description	Add details and content of the claim, and/or graphic.
Proposed claim location	Explain where the claim will appear, and if applicable how it will be applied (e.g., printed, embossed, engraved, etc.,)
Recipients of Claim	Explain who the recipients of the claim are, for example customers or suppliers, consumers, other stakeholders.
Countries	In which countries will the claim be used?
Target launch date for claim	For example, as soon as approval is received, or a future date
Any other information	Add in any other information to support your submission, or to request further information or feedback from the IRMA Secretariat.
Product Claims and non-Members leveraging Product Claims	
Claim request submitted on behalf of the client? If yes, provide the name of the client's company.	Yes/No Name of client/customer:
Validation of Claims	Provide any additional relevant information that would help us to assess the validity of the claim and verify the IRMA audited material status of the applicable Products. • CoC Documents • Confirmation Order
Sourcing IRMA-audited Materials	
Validation of Claims	Provide any additional relevant information that would help us to assess the validity of the claim and verify the IRMA audited material status of the applicable Products. • CoC Documents

IRMA Claims Glossary

Audit
Systematic, independent, and documented process to obtain and evaluate audit evidence objectively to determine the extent of audit criteria fulfilment (Source: ISO 19011:2011).

Audited or independently assessed
Evaluated against an IRMA Standard by an IRMA approved and trained audit firm.

Batch
Specific quantity of a product intended to have uniform characteristics and qualities.

Book
Generation of IRMA AMUs corresponding to the exact quantity of audited material with specified characteristics.

Claim
Declared information regarding the specified characteristics of a material or product that is attributed to the claimant through retirement and, in the case of an emission reduction claim, may be accounted in its emissions inventory (Amended based on ISO 22095:2020).

Entity
A company, corporation, partnership, individual, or other type of organization in the commodity supply chain.

IRMA 100
A producing mine site independently audited against the relevant IRMA Standard and assigned a score of 100 by the audit firm.

IRMA 75
A producing mine site independently audited against the relevant IRMA Standard and assigned a score of 75 by the audit firm.

IRMA 50
A mine site independently audited against the relevant IRMA Standard and assigned a score of 50 by the audit firm.

IRMA Transparency
A mine site independently audited against the relevant IRMA Standard and assigned a score of Transparency (less than 50) by the audit firm.

IRMA-audited mine
A producing mine site independently assessed against the IRMA Mining Standard by an IRMA approved audit firm and assigned a score of IRMA Transparency, 50, 75, or 100 by the audit firm.

IRMA-audited material
Material produced and/or sourced from an IRMA-audited mine site that has been audited as meeting IRMA's Chain-of-Custody Standard.

IRMA-audited material units (IRMA AMUs)
Unit representing a claim for a quantity of material, usually in tonnes or troy ounces, for which there is an IRMA achievement level score.

IRMA CoC Registry
Tracks IRMA-audited material unit inputs and outputs associated with claims to ensure that IRMA-audited claims on IRMA-audited material outputs by downstream users are equal to or less than their corresponding IRMA-audited material inputs by IRMA-audited mine sites to prevent double counting.

IRMA Trust Marks
Visual representations such as logos or labels and text-based claims that convey endorsement by IRMA or assessment against the IRMA Standard(s).

IRMA member in good standing
A member who is current with fees and in compliance with all IRMA qualifications and policies.

Participant:
An entity that has been accepted into the IRMA system and has paid appropriate fees and dues (e.g., an IRMA member from any stakeholder group, a mining company with a mine site that has been or is in the process of being independently audited, an entity that is using the Mine Measure self-assessment tool, a purchaser of mined materials making claims of sourcing materials from IRMA-audited mines).

Pending Members
The Pending Member category has been eliminated per the IRMA membership policy. Existing Pending Members are grandfathered under the old policy. Mining companies in this category are considered Pending Members until they publicly announce the commencement of a third-party audit of at least one mine site, which must occur within 12 months following approval of membership application. Development/exploration/processing companies in this category are considered Pending Members until they publicly announce commencement of an IRMA third party audit of at least one site/project within 12 months of the IRMA Standard update that covers their type of project.

Registry
An electronic data system for the purpose of issuance, holding, transfer, and retirement of IRMA AMUs.

Specified Characteristics
Set of product characteristics, production characteristics, or both (e.g., IRMA Transparent, 50, 75, 100) that the chain of custody shall maintain (Source: ISO 22095:2020).

System user
Entity who holds an account in the IRMA Claim Registry because of an approved application.

Trader
Entity that applies for IRMA CoC Audit for a specific activity that includes buying and selling of materials or products, including raw materials, intermediates, and final products. Examples of traders are first collectors, blenders, wholesale, and retail companies (also companies selling to end-consumers).

Transfer
Transfer of legal and physical control of verified material in the supply chain. In the context of IRMA AMUs and this document, transfer of legal control of verified material registered as an IRMA AMU from one System user to another System user.

Logistics Provider
Any party, person, agent, or carrier that provides freight, household goods, or passenger transportation or related services, such as for example an airline or ship operator transporting cargo or people.

Please also refer to the terms and definitions provided in the IRMA CoC Standard.

www.responsiblemining.net

IRMA Initiative for Responsible Mining Assurance