



# Implementation of the National Minerals Database Template for the ICGLR as part of the Minerals Flow Data Vault

## Standardization, Sovereignty and Network of Trust

GlZ Support to the International Conference on the Great Lakes Region (ICGLR)

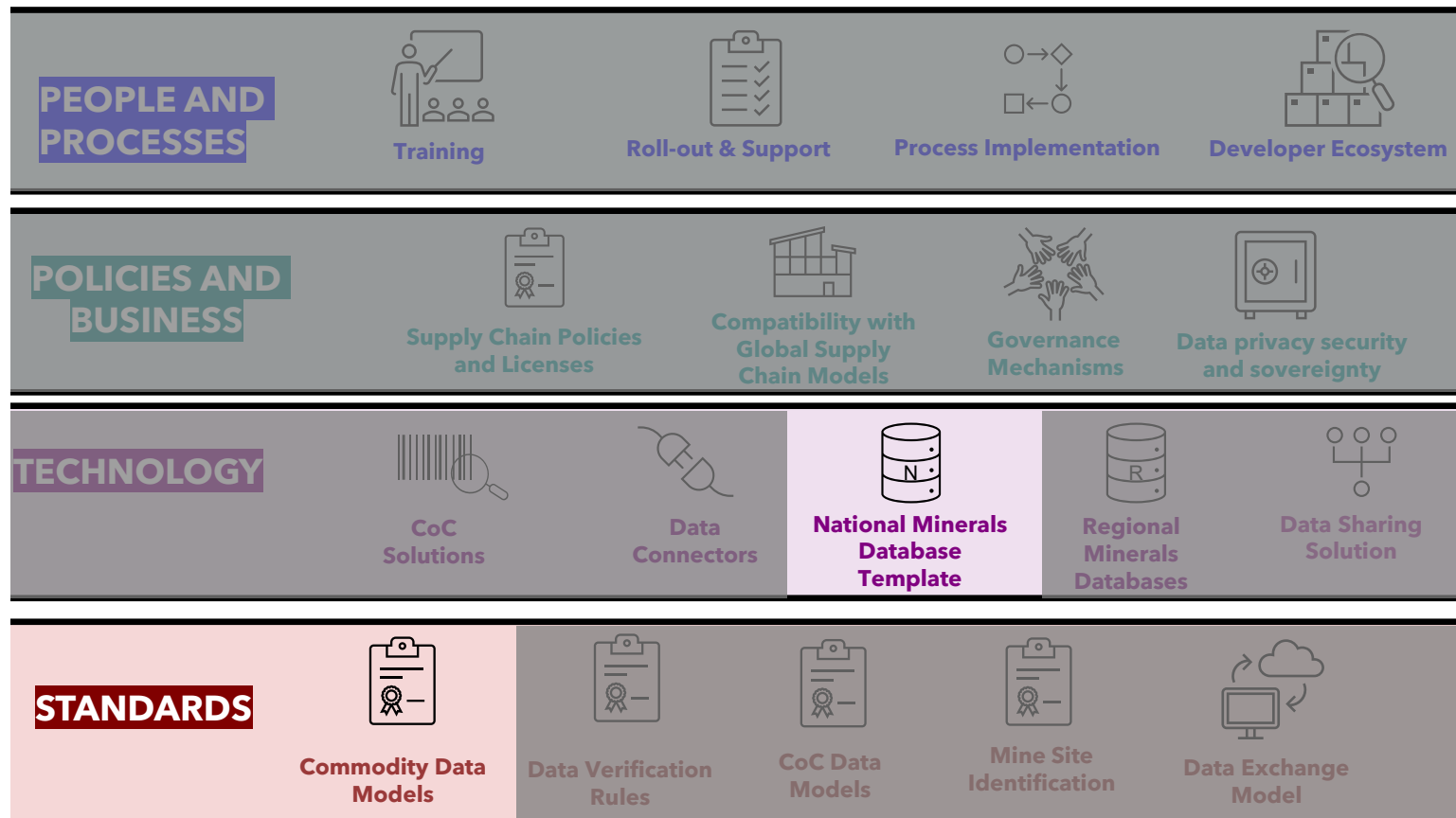


# Overview

- Based on the agreed architecture vision for the minerals flow data vault GIZ developed a **prototype for a national minerals database template**
- **Next steps:**
  - Member states who intend to implement the national minerals database based on shared template should synchronize with ICGLR to be acknowledged **early adopter**
  - GIZ supports **rollout** of NMDB for early adopters
  - **Adjustment of functionalities** according to early adopter's feedback
  - End user **documentation**

# National Minerals Database Template

Implementation of NMDB as integral part of the architecture vision framework by ICGLR, private actors and Member States

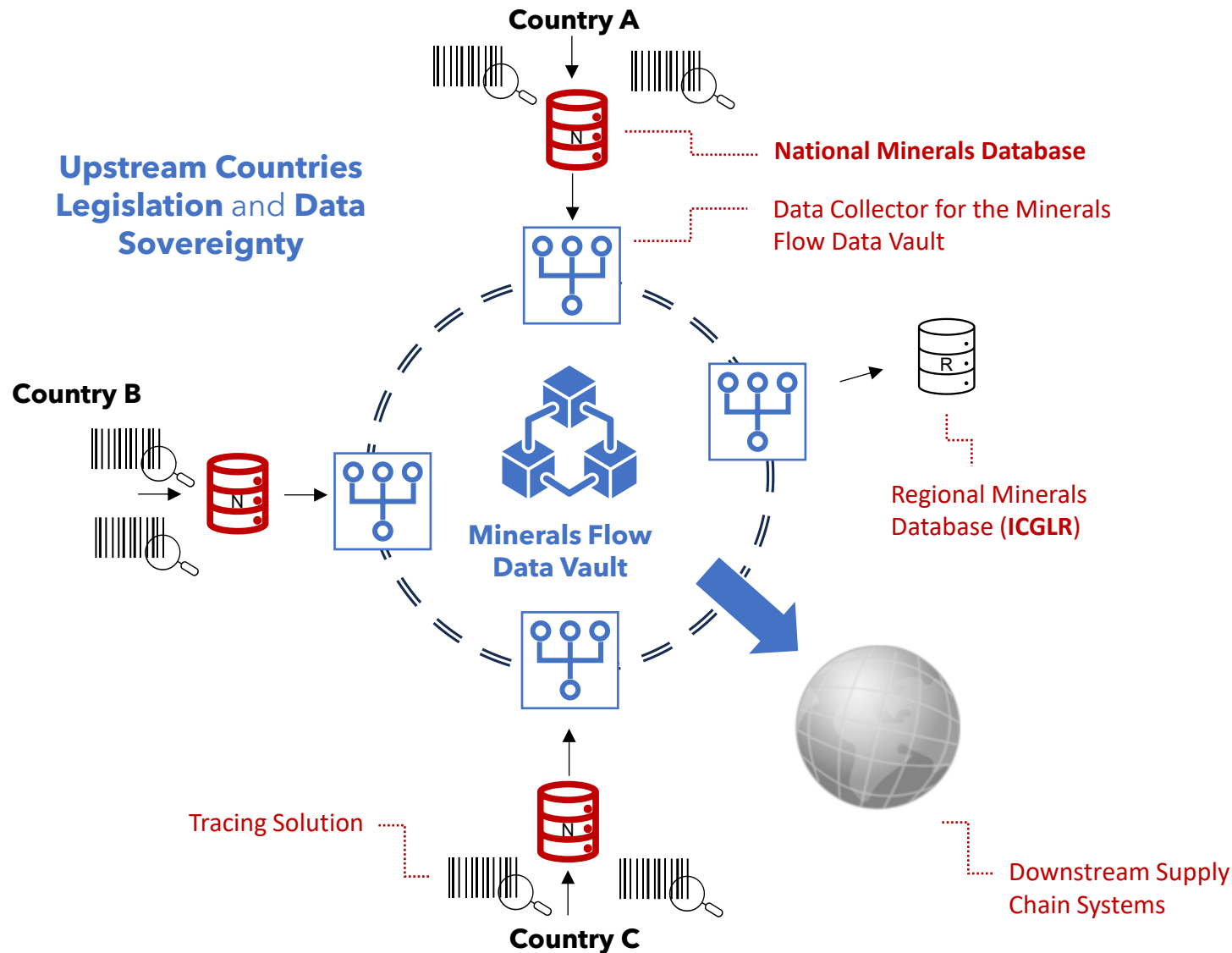


→ First **prototype** for the national minerals database template

→ **Data models** for the NMDB were designed.  
**Drafts for data exchange** models exist

# Architecture Vision for the Minerals Data Vault based on RCM

## National Minerals Database Template as integral part of the vision



## Architecture Vision

- Data **physically in full sovereignty** by each member state, secured by latest cryptography.
- Creating a **network of trust** based on industry-standard distributed database architecture.
- Data collected based on agreed data standards in **national minerals databases**
- Interoperability of data based on **aligned data sharing** standards.

# General Features for the National Minerals Database Template

- Open Source - **license free** usage
- Based on data sharing standards of **RCM - compatible** with RCM
- **Dashboards** included
- **Integration** into existing environments
- **Multi Language** Support
- Flexible adjustments of **Workflows**
- Based on **GovStack** (a recognized architecture pattern for governments)
- **GIS** integrated
- Highly **configurable** - admin module for settings, locations and master data

# Covered Business Processes for the National Minerals Database Template

- Manage **Master Data**
  - Mine sites, organizations, locations, minerals, license types
- Manage **Licenses**
  - **Assign** licenses to organizations
- Manage **Inspections**
  - **Document** inspections per mine site
- Manage **Export Certificates**
  - **Document** export certificates
  - Generate **printout** version and QR code
- Manage **Production**
  - Assign or revoke tags
  - Document lot production



# Submit License Requests and Manage Licenses

Licenses approved by workflow (if required)  
Accessible from external applications (if required)  
GIS support to document the license geo data

# Screenshot: Request a License

Minerals Tracking

Thomas Wiemann

tw@thomas-wiemann.com

Manage Minesites

Export Certificates

Licenses

Production Management

Inspections

Administration

Thu, 20 Mar 2025

Home

Manage Licenses by Organizations

Request new License

Organization Information

Organization Name

Organisation 2

License Information

+

-

+

+

+

Assigned License \*

Extract Gold

License Valid From \*

03/01/2025

License Valid Until \*

03/31/2025

Attached Files

Drop files here or click to upload.

test-2.pdf [remove](#)

Submit

Already existing Licenses

10

Show

Delete

| <input type="checkbox"/> | organizationId | Assigned License | License Valid From | License Valid Until | organizationLicenseStatus | polygonData                                                                               |
|--------------------------|----------------|------------------|--------------------|---------------------|---------------------------|-------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | Organisation 2 | Extraction Tin   | 2024-12-01         | 2026-12-31          |                           |                                                                                           |
| <input type="checkbox"/> | Organisation 2 | Export Rubi 1    | 2025-01-01         | 2026-01-01          |                           |                                                                                           |
| <input type="checkbox"/> | Organisation 2 | Extract Gold     | 2025-03-01         | 2025-03-31          | approved                  | [[-3.325807,29.763041],[-3.510871,29.666935],[-3.513613,30.047239],[-3.218865,30.115886]] |
| <input type="checkbox"/> | Organisation 2 | Export Rubi 1    | 2025-03-02         | 2025-03-04          | approved                  |                                                                                           |

- Manage licenses for different types of mining licenses (exploration, ASM, LSM quarry) in accordance with the national legal framework
- License. **application, removal and monitoring**
- Reporting** by license holders to mining sector authorities



# Create, Print and View Export Certificates

Certificates approved by Workflow (if required)  
Accessible from external applications (if required)  
QR Codes for easy validation of export certificates



| ICGLR<br>Certificate                                                                                                                                                                                | <b>International Conference on the Great Lakes Region (ICGLR) Certificate</b><br><i>Certificat de la Conférence internationale sur la Région des Grands Lacs</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ICGLR<br>Certificate                                                                                                                                                                       | ICGLR<br>Certificate                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
|                                                                                                                    | <br><b>Republic of Country</b><br><i>La République de Pays</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                         |                      |
|                                                                                                                                                                                                     | <b>REPUBLIC OF COUNTRY</b><br><i>LA RÉPUBLIQUE DE PAYS</i><br><br><b>MINISTRY OF ENERGY AND MINERAL DEVELOPMENT</b><br><i>MINISTÈRE DE L'ÉNERGIE ET DU DÉVELOPPEMENT MINIER</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                            |                                                                                                         |
| <b>ICGLR00001</b><br><br><b>This is to certify that the designated mineral has been received and Checked</b><br><i>Il est certifier que le(s) minerais désigné a(ont) été reçu(s) et vérifié(s)</i> | <p><b>This is to certify that Shipment No. 1234</b> <b>comprise of 3</b> <b>lots packed in</b><br/> <i>Il est certifie que l'envoi no</i> <i>Compose de</i> <i>Lots emballes dans</i></p> <p><b>(number and packages) containing Tin processed</b><br/> <i>(Nombre et colis) contenant</i></p> <p><b>(weight) of 1000 (designated mineral) produced from Tin Minesite</b><br/> <i>(Poids) de (Minerais désigné) produit a partir de</i></p> <p><b>Mine(s) in Burundi-&gt;Region District(s) Burundi-&gt;Region-&gt;District</b><br/> <i>Mine(s) dans le(s) District(s) de</i></p> <p><b>in the Republic of country has been mined, traded and handled in accordance with the Law of Country and ICGLR requirements.</b><br/> <i>en République de pays a été extrait, commercialisé et traite conformément aux lois du pays et aux exigences de la CIRGL</i></p> <p><b>Exporter's Name Organisation 2</b> <b>Exporter's Licence No.</b><br/> <i>Nom de l'exportateur</i> <i>Numero de licence d'exportateur</i></p> <p><b>Exporter's legal and physical Address</b><br/> <i>Adresse legale et physique de l'exportateur</i></p> <p><b>Importer's Name, legal and physical Address</b><br/> <i>Nom de l'importateur, adresse legale et physique</i></p> <p><b>Date of Shipment 2025-03-17</b> <b>Shipment Means and Route</b><br/> <i>Date d'expédition</i> <i>Moyen et itineraire d'expédition</i></p> <p><b>Transporter's Name and Address</b><br/> <i>Nom et Adresse du transporteur</i></p> | <b>ICGLR00001</b><br><br><b>This is to certify that the designated mineral has been imported into</b><br><i>La présente certifie que le(s) minerais désigné a(ont) été importé(s) dans</i> | <b>ICGLR00001</b>                                                                                       |
| <b>Signature and Stamp of Smelter/Refinery</b><br><i>Signature et cachet de la fonderie/raffinerie</i>                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Signature and Stamp of Smelter/Refinery</b><br><i>Signature et cachet de la fonderie/raffinerie</i>                                                                                     |                                                                                                         |
| <b>To be returned to: The Commissioner for Mines Department, P.O. Box num, City, Country</b><br><i>A retourner au; Commissaire du Département des Mines, PO Box num, City, Country</i>              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>To be returned to: The Commissioner for Mines Department, P.O. Box num, City, Country</b><br><i>A retourner au; Commissaire du Département des Mines, PO Box num, City, Country</i>     |                                                                                                         |
| <br><b>ABC1234</b>                                                                                               | <p><b>Varification Officer</b>..... <b>Countersigning Officer</b>.....<br/> <i>Agent Vérificateur</i> <i>Agent Contresignataire</i></p> <p><b>Position</b>..... <b>Position</b>.....<br/> <i>Position</i> <i>Position</i></p> <p><b>Signature &amp; Official Stamp</b>..... <b>Signature</b>..... <b>Date</b>.....<br/> <i>Signature et cachet officiel</i> <i>Signature</i> <i>Date</i></p> <p><b>Date of Verification</b>..... <b>Valid for 90 days from the Countersigned date</b>..... <b>the requirements of the ICGLR standards</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <br><b>ABC1234</b>                                                                                    | <br><b>ABC1234</b> |

- 11 September 2025

# Screenshot: Generation of Export Certificates as PDF and QR code

Minerals Tracking

Thomas Wiemann

tw@thomas-wiemann.com

Manage Minesites

Export Certificates

Manage Export Certificates for Exporters

All Export Certificates

Dashboard Export Certificates

Licenses

Manage Licenses for Organisations

All Licenses assigned to Organizations

Production Management

Inspections

Administration

Thu, 20 Mar 2025

USA

CHN

FRA

1

Exporter Information

Exporter Name

Organisation 2

Export License

Active Licenses

Commodity Details

|                     |               |                       |           |
|---------------------|---------------|-----------------------|-----------|
| Producing Minesite  | Tin Minesite  | Net Weight kg         | 1000      |
| Commodity Name      | Tin processed | Refinement Level in % | 90,00     |
| Date of Certificate | 2025-03-03    | Shipment Value        | 10.000,00 |

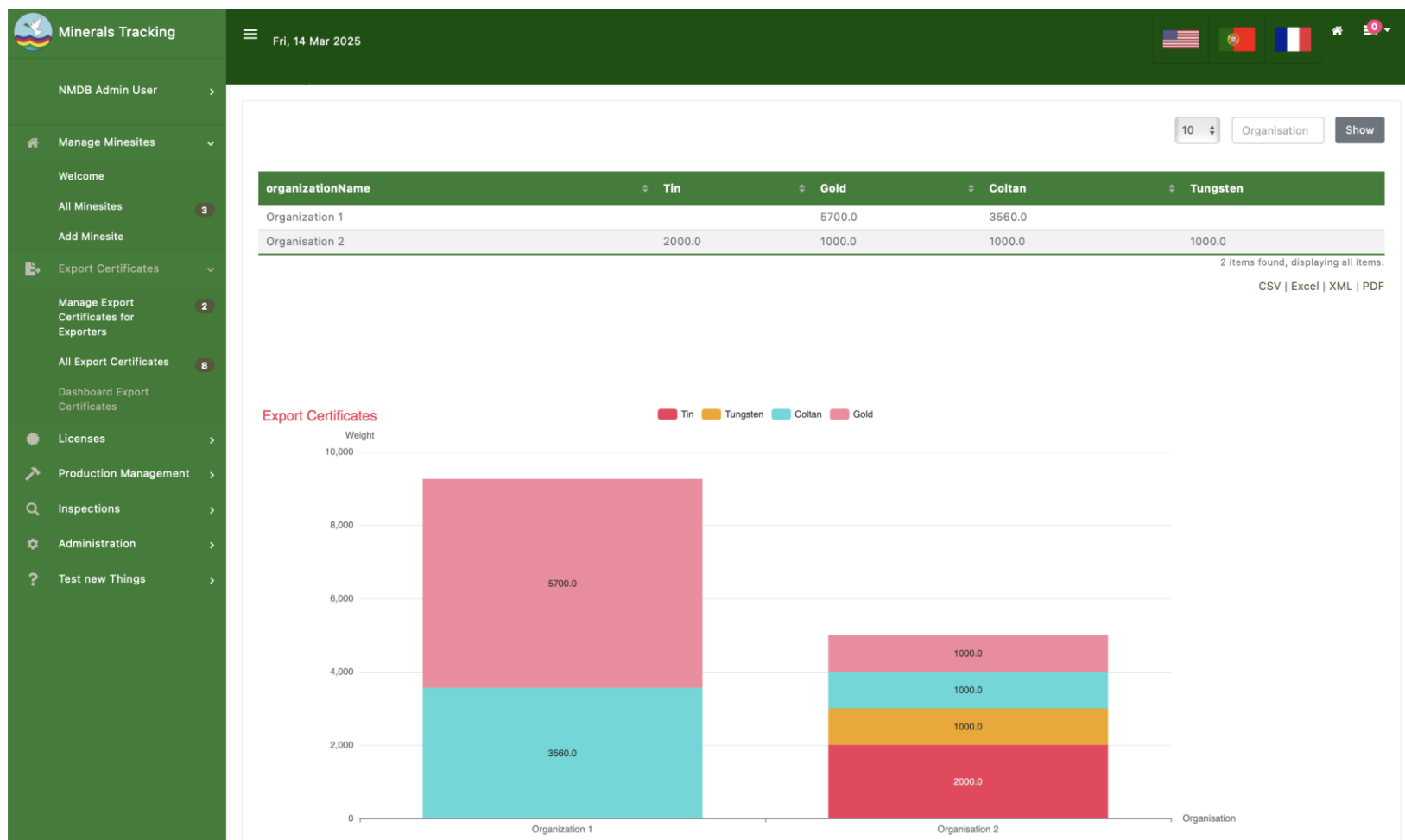
Packaging and Shipment Information

|                  |            |                |         |
|------------------|------------|----------------|---------|
| Shipment Number  | 1234       | Count of Lots  | 3       |
| Date of Shipment | 2025-03-17 | Shipment Means | Truck   |
|                  |            | Shipment Route | mombasa |



- **Creation of digital ICGLR certificates** in accordance with the requirements of the ICGLR
- **Multi-step approval process** that can be customised to specific country context
- Each ICGLR certificate can be **validated through a unique identifier** and QR code

# Screenshot: Dashboard for Export Certificates



- **Monitoring of exports** through a real-time dashboard



# Manage the Production

Assign tags according to the supported CoC scheme (e.g. ITSCI) to a mine site

Bulk upload tags

Submit production records and approve them according to the agreed workflow

Record the full chain of custody from production to export



# Screenshot: Assignment of Tags


Minerals Tracking

Fri, 14 Mar 2025





NMDB Admin User

Manage Minesites

Export Certificates

Licenses

Production Management

Inspections

Administration

Test new Things

Minesite Information

Minesite: Kisangani  
Minesite Owner Name: Owner Information

Assigned Tags

10
Show

Bulk Remove Tags

| <input type="checkbox"/> | Tag Token    | Tag Status      |
|--------------------------|--------------|-----------------|
| <input type="checkbox"/> | 123          | assignedUsed    |
| <input type="checkbox"/> | 2025-0000009 | assignedUsed    |
| <input type="checkbox"/> | 2025-0000039 | assignedNotUsed |
| <input type="checkbox"/> | 2025-0000033 | assignedNotUsed |
| <input type="checkbox"/> | 2025-0000018 | assignedNotUsed |
| <input type="checkbox"/> | 2025-0000004 | assignedUsed    |
| <input type="checkbox"/> | 2025-0000015 | assignedUsed    |
| <input type="checkbox"/> | 2025-0000025 | assignedNotUsed |
| <input type="checkbox"/> | 2025-0000053 | assignedNotUsed |
| <input type="checkbox"/> | 2025-0000057 | assignedNotUsed |

14 items found, displaying 1 to 10.

CSV | Excel | XML | PDF

Bulk Remove Tags

Unassigned Tags

10
Show

Bulk Assign Tags

| <input type="checkbox"/> | Tag Token    | Tag Status |
|--------------------------|--------------|------------|
| <input type="checkbox"/> | 2025-0000002 | imported   |
| <input type="checkbox"/> | 2025-0000059 | imported   |
| <input type="checkbox"/> | 2025-0000032 | imported   |
| <input type="checkbox"/> | 2025-0000027 | imported   |
| <input type="checkbox"/> | 2025-0000006 | imported   |
| <input type="checkbox"/> | 2025-0000045 | imported   |
| <input type="checkbox"/> | 2025-0000008 | imported   |
| <input type="checkbox"/> | 2025-0000013 | imported   |
| <input type="checkbox"/> | 12345        | imported   |
| <input type="checkbox"/> | 2025-0000046 | imported   |

33 items found, displaying 1 to 10.

CSV | Excel | XML | PDF

Bulk Assign Tags

- Assign tags to **implement chain of custody** within the mineral supply chains
- Record the full chain of custody from production to export
- Third-party chain of custody** providers can be integrated through AP (e.g. ITSCI, BSP, MineSpider)
- Bulk upload tags
- Submit **production records** and approve them according to the agreed workflow

# Screenshot: Document Lot Production

Minerals Tracking

NMDB Admin User

Manage Minesites

Export Certificates

Licenses

Production Management

Inspections

Administration

Fri, 14 Mar 2025



Approve Lot

Minesite Information

Minesite NameKisangani

Chain of Custody - Lot Registration

Date of Production \*YYYY-MM-DD

Net Weight kgs \*

Commodity Name \*

Price per KG (in \$)

Assigned Tag \*2025-0000018

Refinement Level in %

Submit

10lotStatusShow

| <input type="checkbox"/> | Minesite Name | lotStatus | Commodity Name | Date of Production | Net Weight kgs | Price per KG (in \$) | Assigned Tag |
|--------------------------|---------------|-----------|----------------|--------------------|----------------|----------------------|--------------|
| <input type="checkbox"/> | Kisangani     | approved  | Tin Raw        | 2025-03-05         | 1000           |                      | 2025-0000004 |
| <input type="checkbox"/> | Kisangani     | approved  | Tungsten Raw   | 2025-03-05         | 1000           |                      | 2025-0000009 |
| <input type="checkbox"/> | Kisangani     | approved  | Coltan Raw     | 2025-03-05         | 1000           |                      | 123          |
| <input type="checkbox"/> | Kisangani     | approved  | Gold           | 2025-03-05         | 100            |                      | 2025-0000015 |
| <input type="checkbox"/> | Kisangani     | approved  | Coltan Raw     | 2025-03-07         | 2010           | 100                  | 2025-0000001 |
| <input type="checkbox"/> | Kisangani     | approved  | Coltan Raw     | 2025-03-07         | 2000           |                      | 2025-0000012 |

6 items found, displaying all items.

CSV | Excel | XML | PDF



# Manage Inspections

Record inspection information to the mine site  
Inspections approved by Workflow (if required)  
Attach files for details

# Screenshot: Document an Inspection


Minerals Tracking

Fri, 21 Mar 2025



Thomas Wiemann  
tw@thomas-wiemann.com

Manage Minesites  
Export Certificates  
Licenses  
Production Management  
Inspections  
Administration

## Add an Inspection

### Minesite Information

Minesite: Kisangani

Minesite Owner Name: Owner Information

### Minesite Inspection Information

Date of Inspection: YYYY-MM-DD

Aggregated Inspection Result: Blue

Inspection Entity: Government

Inspection Information

Inspection Files

Save

### All Inspections for the Minesite

Delete

|                          | Inspection Entity | Aggregated Inspection Result | Date of Inspection | Created By Name | Modified By Name | Date Created        | Date Modified       |
|--------------------------|-------------------|------------------------------|--------------------|-----------------|------------------|---------------------|---------------------|
| <input type="checkbox"/> | government        | blue                         | 2025-03-19         | Thomas Wiemann  | Thomas Wiemann   | 19-03-2025 11:23 PM | 19-03-2025 11:23 PM |
| <input type="checkbox"/> | government        | green                        | 2025-03-05         | Thomas Wiemann  | Thomas Wiemann   | 05-03-2025 09:25 AM | 05-03-2025 09:25 AM |

- Manage mine site inspection for the entire mining sector
- Record inspection information and upload **supporting documents**
- Assign **ICGLR mine site status** to inspected mines (red, yellow, green)
- Workflows and approvals** can be adjusted in accordance with country-needs
- Dashboards** for real-time monitoring



# Thank you

**giz** Deutsche Gesellschaft  
für Internationale  
Zusammenarbeit (GIZ) GmbH

