COP28 EVENT - DIGITAL FOR CLIMATE (D4C)

Building an End-to-End Digital Ecosystem for Carbon Market

December 3 | 15:00 pm Dubai time

Location: UN Climate Change Global Innovation Hub COP28

United Nations Climate Change
Global Innovation Hub

DIGITAL FOR CLIMATE

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DIGITAL FOR CLIMATE (D4C):

Building an End-to-End Digital Ecosystem for Carbon Markets

PANELISTS

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AGENDA

OPENING REMARKS:

- **Massamba Thioye**, Project Executive, Global Innovation Hub, UNFCCC

MODERATOR:

- **Chandra Shekar Sinha**, Global Lead for Carbon Markets and Finance, Climate Change Group, World Bank

TECHNICAL PRESENTATIONS:

Automating the generation of project design documents (PDD) with UNFCCC PDD tool

- **Panna Siyag**, Program Officer, UNFCCC

Integrating UNDP project workflow platform and WB national carbon registry to enhance efficiency in project preparation and registration

- **Alexandra Soezer**, Global Carbon Technical Advisor, Energy, UNDP

Integrating EBRD digital MRV with WB national carbon registry: Piloting automation of carbon project asset generation

- **Dmitry Halubouski**, Associate, Climate Finance and Carbon Markets, EBRD
- **Mert Ozdag**, IT Officer, Technology & Innovation Lab, World Bank

Facilitating efficient accounting for Article 6 adoption through UNDP and WB open-source national carbon registries

- **Reina Otsuka**, Lead Digital Innovation for Climate Nature and Energy, UNDP
- **Gemma Torras Vives**, Climate & Technology Specialist, Climate Warehouse, World Bank

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OPENING REMARKS

TECHNICAL PRESENTATIONS

Building End-to-End Digital Solutions to Streamline Carbon Asset Development & Trading

Digital Methodology
Digitalization of Methodologies: smart contract toward the digitization of the mitigation activity cycle

1

Physical Layer (MRV)

Program Level MRV

- Equipment
- Sensors
- Meters
- Satellite

Facility Level MRV

3

Database Layer (MRV)

Centralized Database optionally to National MRV System

Registry Layer

- Independent Standards
- Country registries
- 4 UNFCCC registries
- Opensource registries

Transaction Layer

- Exchange A
- Exchange B
- Exchange X

Tokenization Engine
Digital Carbon Assets

Account Holder Wallets
Digital Carbon Assets

Metadata Layer

Climate Action Data Trust

5

Digital Asset Status Tracking

Service Layer

- Compliance Reporting
- Benchmarking
- Due Diligence
- Ratings
- Forecasting
- Entity Due Diligence
- Jurisdictional Regulation

Verification of units

Reporting for markets, UNFCCC

2

Digital workflow
Project preparation from document development, approval, validation to registration in applicable standards

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Automating the generation of project design documents (PDD) with UNFCCC PDD tool

- **Panna Siyag**, Program Officer, UNFCCC

Digitalization of CDM methodologies

Web-based tool to generate Project Design Documents

Introduction

Problem definition

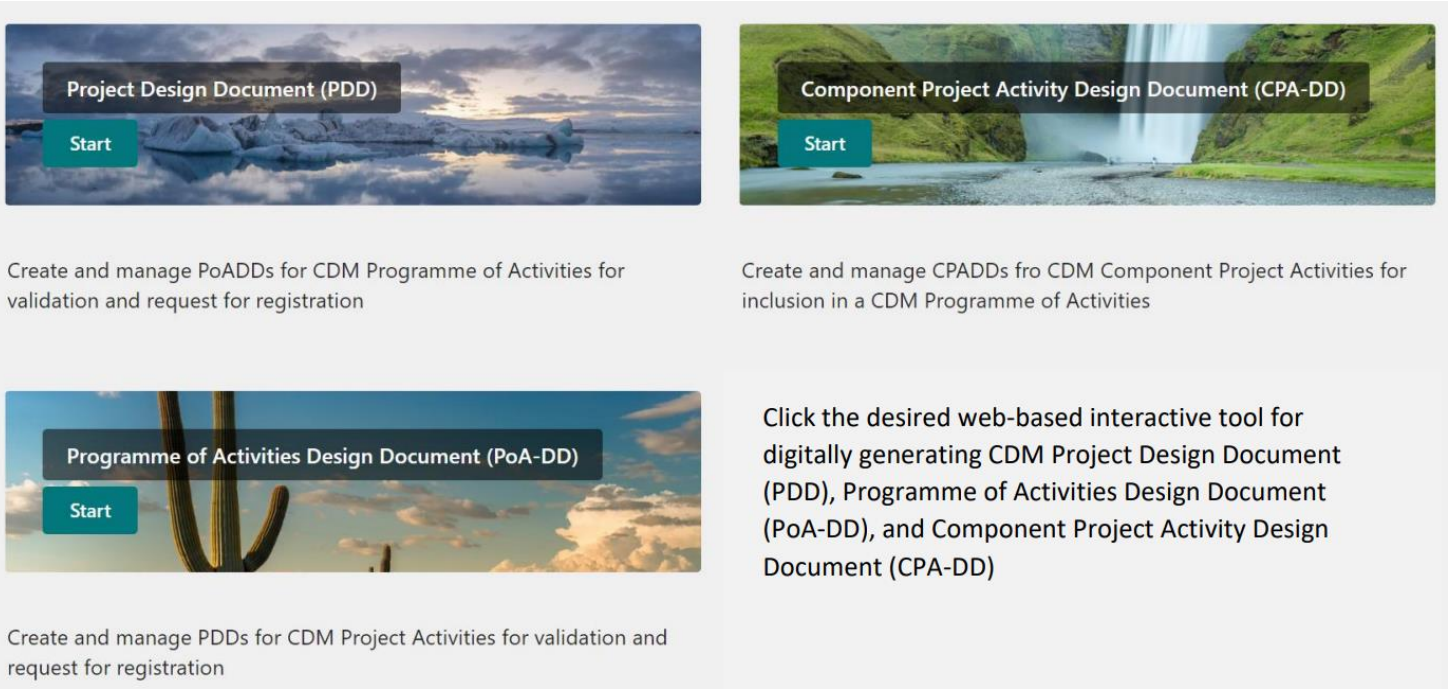
- Complexity of CDM methodological landscape (> 200 methodologies, plus many more methodological tools)
- Participation barrier for low-resource entities: need to hire consultants
- Variability in content and structure of Project Design Documents
- Inaccessibility of data related to projects (e.g. >8,000 PDF documents to be manually searched)

Solution

- Digitalized methodologies
- Web-based interactive application to help develop PDDs
- Automated workflow
- Database of projects builds up in real time

How it works

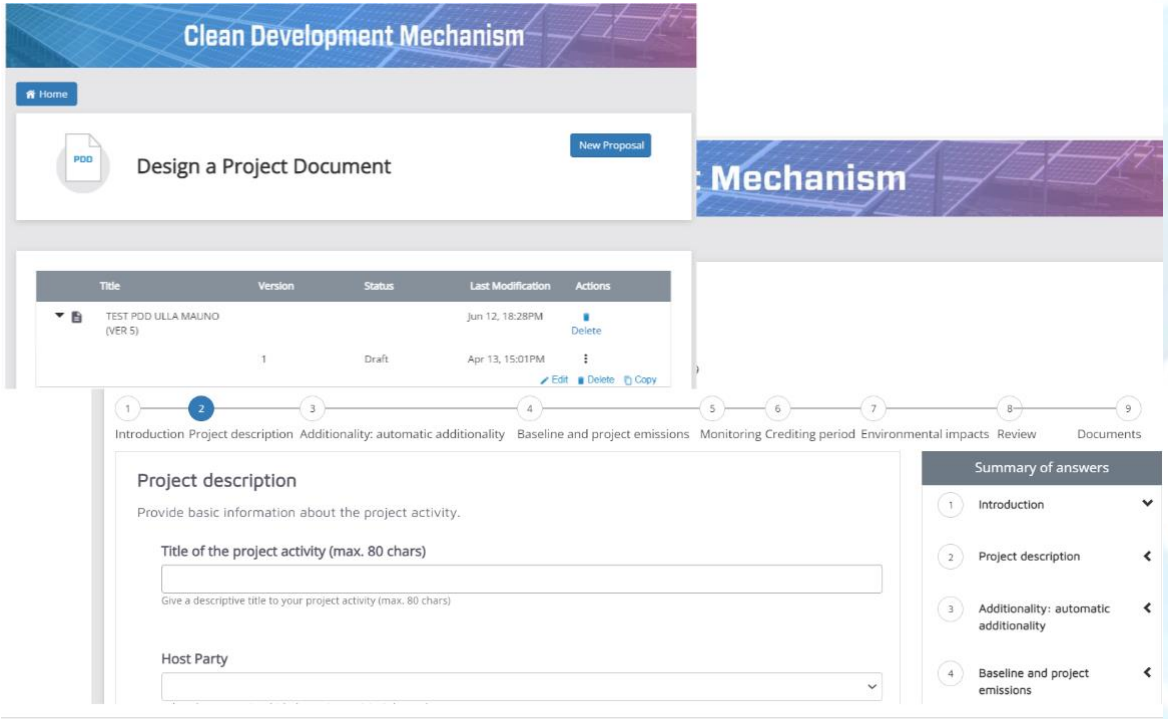
CDM e-Services Digitalization Toolkit



Digitalization of CDM methodologies

Web-based tool to generate Project Design Documents

How it works (2)



Value added

Efficient process of PDD development

- User focus on the technical details; reduced complexity; broader accessibility
- PDD development expedited: saves time and effort

Data validation and automated calculations

- Input data is requested only once (single source)
- Data is validated at input time: fewer errors in data
- Calculations performed digitally: fewer errors in calculations

Standardized PDD content and structure

- Objective, consistent, and standardized PDD
- Limits subjective and unrelated content

Find out how to test the PDD-generating tool: https://www.theclimatewarehouse.org/work/digital-4-climate

Integrating UNDP project workflow platform and WB national carbon registry to enhance efficiency in project preparation and registration

- **Alexandra Soezer**, Global Carbon Technical Advisor, Energy, UNDP

Integrating UNDP cooperation workflow platform and WB national carbon registry

Building an end-to-end digital system to streamline carbon generation cycle

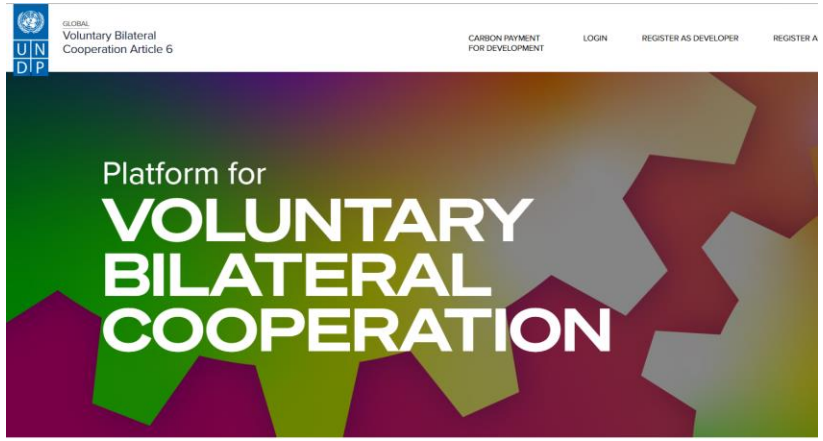
- Many countries are now simultaneously working towards developing national frameworks and processes that can **fulfil the requirements of Article 6 transactions**, while also entering into cooperation agreements as both host and acquiring countries.

- The UNDP workflow platform supports all steps between the registration of a developer to the request for issuance of a project, including all steps in between.

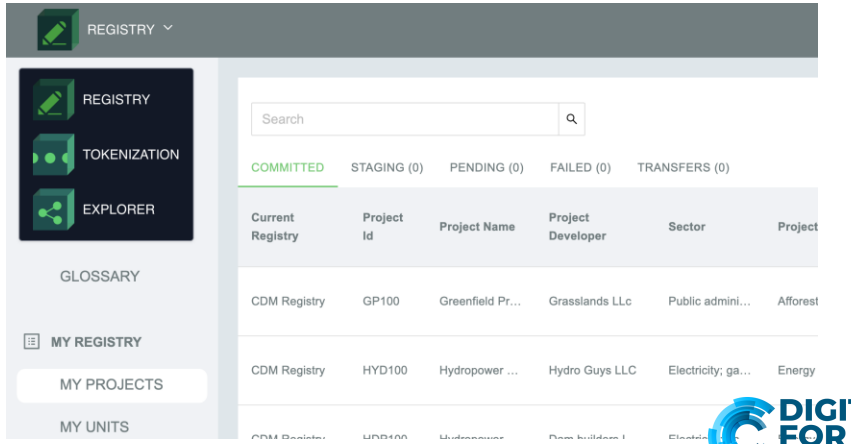
- **Linking the project workflow platform to an opensource registry system** will offer countries a seamless end-to-end digital system that supports all steps in the process: **project workflow, creation of carbon assets and the issuance, transfer or cancellation and ultimately the monetization of mitigation outcomes; and connecting to the Climate Action Data Trust (CAD Trust).**

- The linkage of all modular components relevant for the Article 6 project cycle and its implementation processes, helps streamlining complexity and enhancing transparency through an interoperable and modular system.

UNDP ITMO project workflow platform

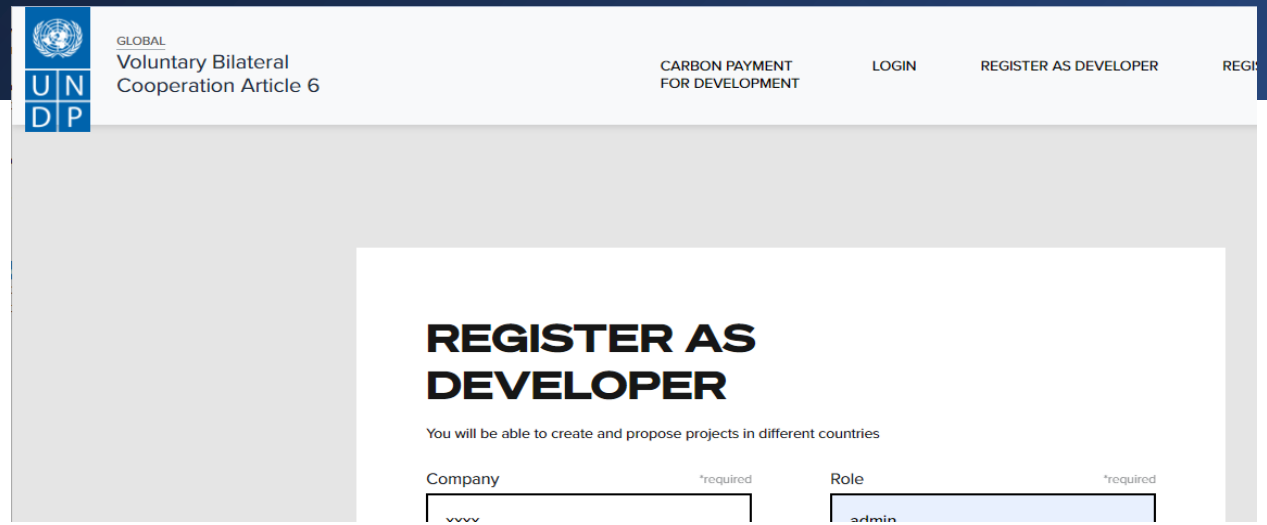


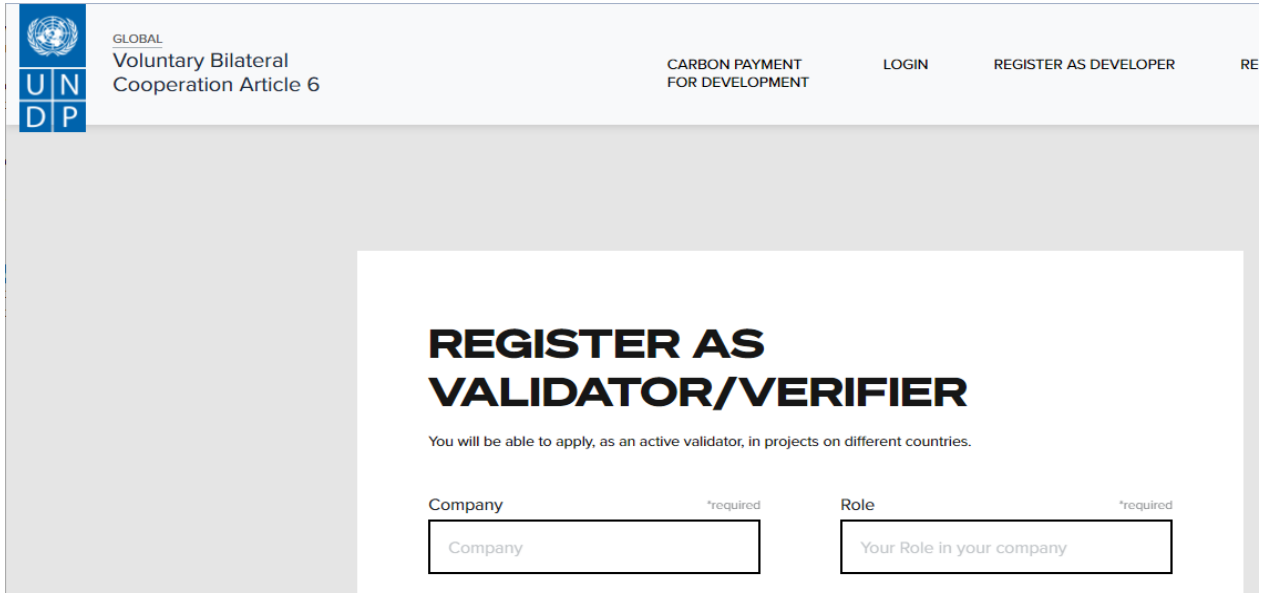
WB Core Registry

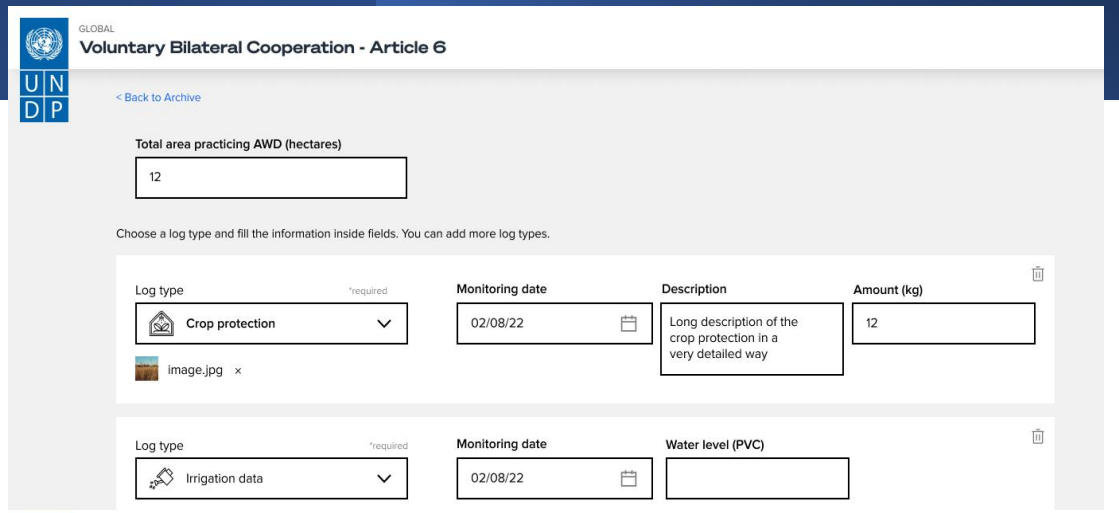


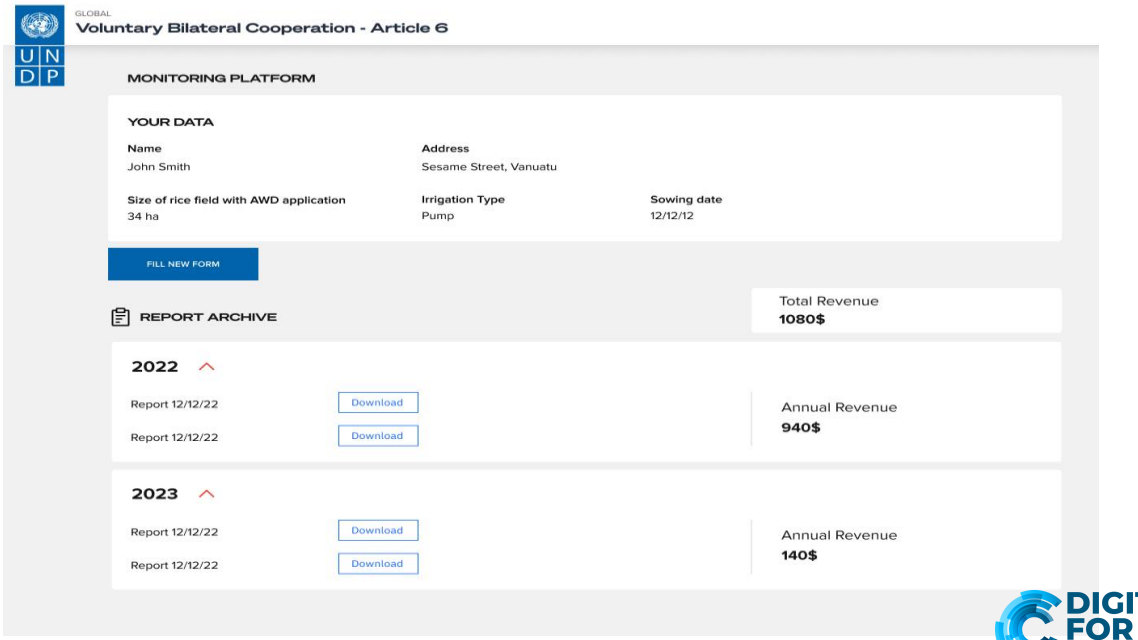
Workflow through the UNDP cooperation platform

Building an end-to-end digital system to streamline carbon generation cycle



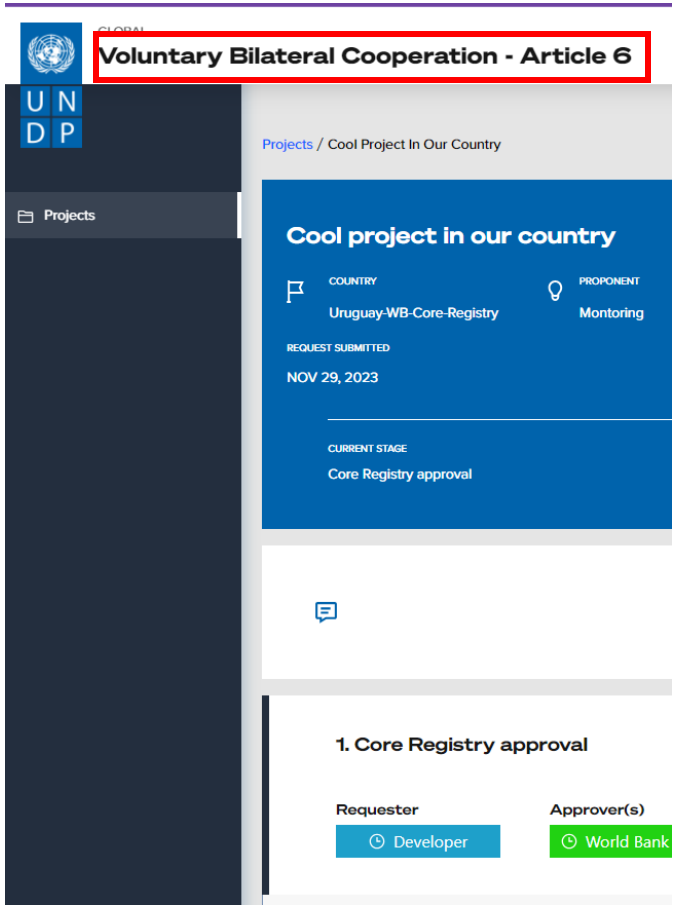


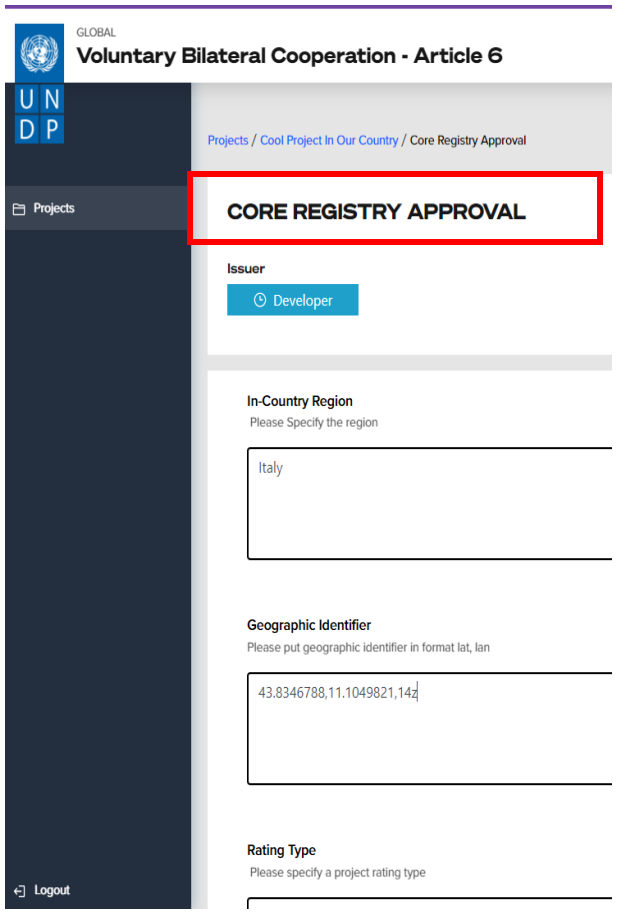


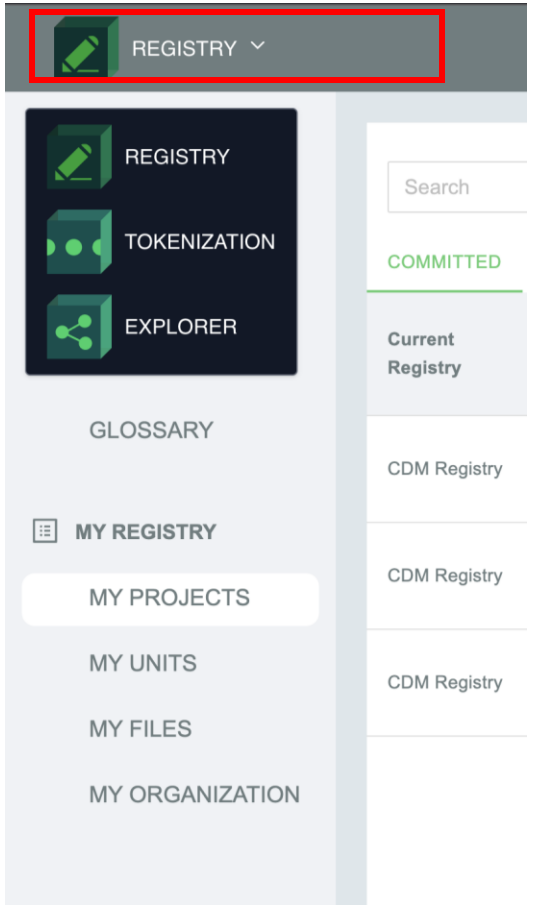


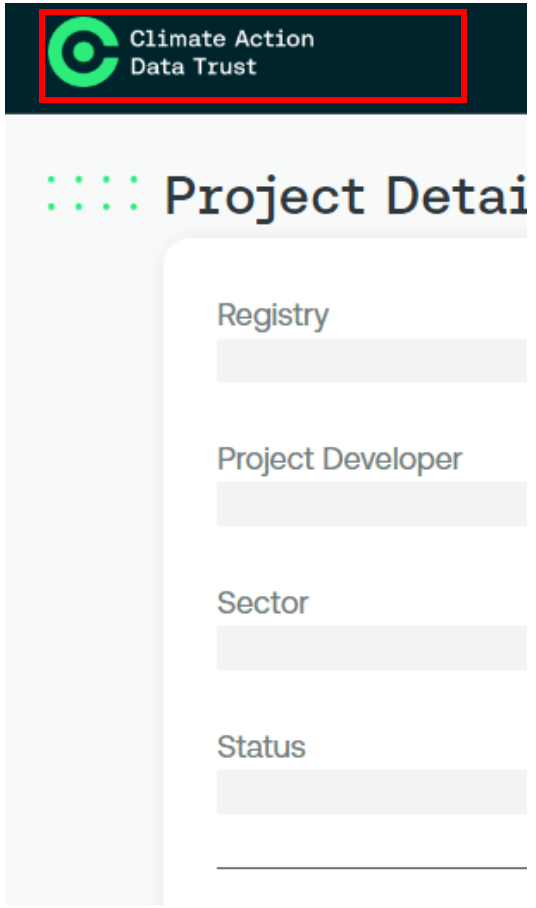
Workflow through UNDP cooperation platform, WB carbon registry and CAD Trust

Building an end-to-end digital system to streamline the project









1) Project registration & validation

2) Submitting project to Registry

3) Project listed in registry and surfacing in CAD Trust

Integrating EBRD digital MRV with WB national carbon registry: Piloting automation of carbon project asset generation

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Building End-to-End Digital Solutions to Streamline Carbon Asset Development & Trading

Digital Methodology

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Verification of units

Reporting for markets, UNFCCC

Digital workflow

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Building End-to-End DMRV-Registry Integration Features

Objectives of the EBRD-WB collaboration under D4C

1. Demonstrate that Digital MRV and Carbon Registry can exchange data for renewable energy projects in fully automated way and allow for near real-time reporting of system-verified results
2. Demonstrate continuous and automated data exchange, reduced overall effort, increased frequency of mitigation outcome issuance and enhanced reliability while mitigating security related risks

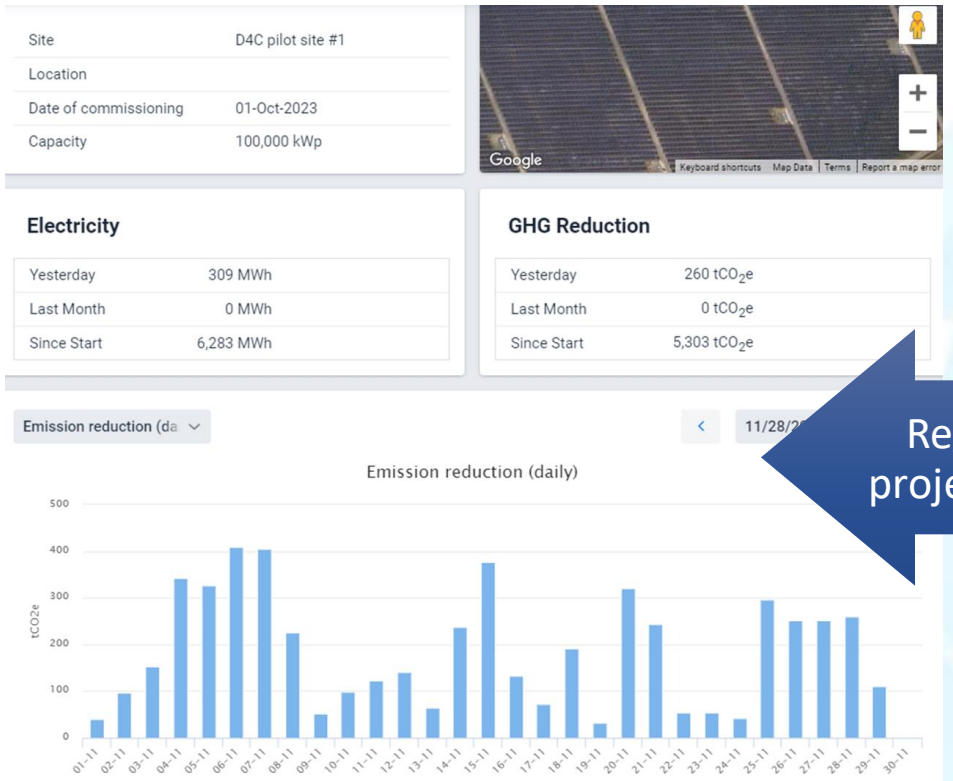
EBRD - Digital MRV	World Bank - Carbon Registry
• Enables real-time monitoring of mitigation projects, in-system verification and reporting on achieved emission reductions • Piloted for renewable energy projects, but can support other types	• Keeps track of climate mitigation projects and mitigation outcome workflow for each project at the national level • Can be linked to a national MRV for GHG accounting

Opening new possibilities and opportunities for international carbon markets

- Access to more reliable and high-quality mitigation outcomes
- Increased market liquidity with mitigation outcomes being issued more frequently
- Increased global trust in the market
- Reporting standardization

End-to-End DMRV-Registry Integration Features

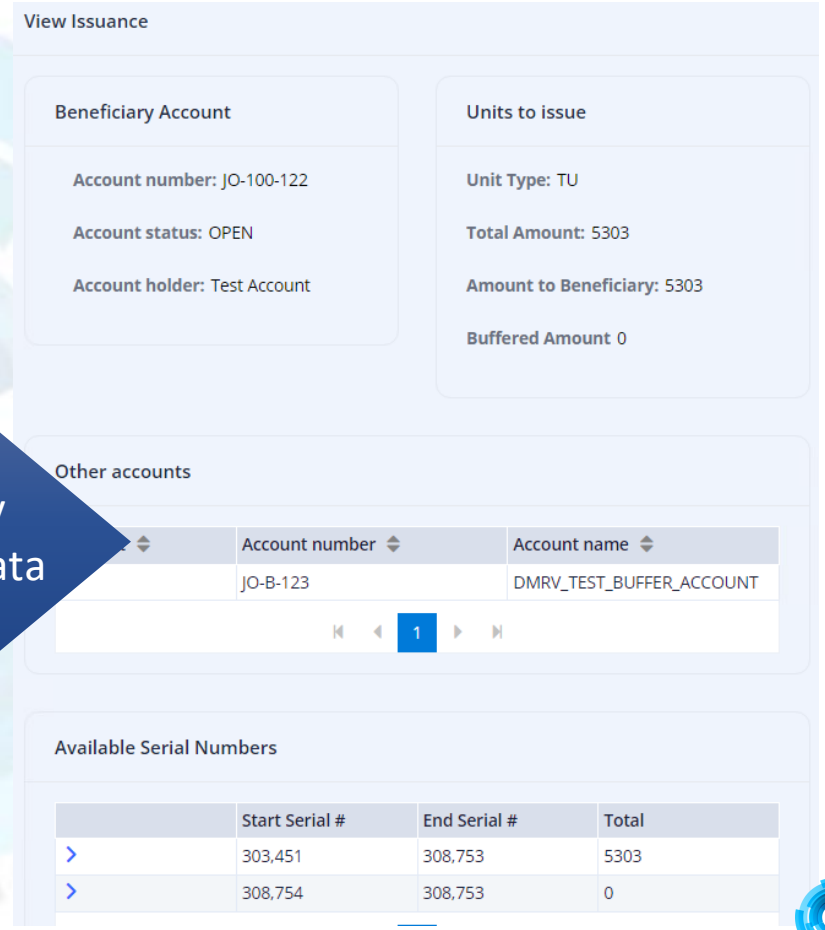
EBRD – Digital MRV



Registry project data

Digital MRV monitoring data

World Bank – Carbon Registry



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End-to-End DMRV-Registry Integration Features

DMRV - Carbon Registry features:

Digital MRV	Carbon Registry
• Automatized data gathering • Data correction and reporting • Security of exchange through encrypted communication	• Frequency of data exchange can be adjusted (daily, weekly, monthly, yearly) • Reporting documents are automatically issued

Main outcomes for the Ecosystem:

Project Developers	Carbon Registry Holders
• Automatized reporting • Possible remote verification • Reduce costs, human mistakes, time and risks • Access to more accurate data	• Up-to-date registry with continuous flow of data • Faster issuance of mitigation outcomes and trading with other parties • Higher quality mitigation outcomes

Challenges ahead – Expanding Integration possibilities

Future Steps	Impact on carbon market
Linkage of UNFCC's digital methodology to DMRV system	• Fully digitize the carbon market value chain from methodologies to issuance
Linkage to National MRV systems	• Allow robust national GHG accounting and reporting to reinforce transparency and trust in the market • Facilitate monitoring and reporting at the country level
Synchronization with CAD Trust	• Improve data consistency with the overall carbon market digital ecosystem
Implement dynamically updated grid emission factor (GEF)	• Assist other emission reduction projects to access an up-to-date GEF for emission reduction calculation
Replicability with more projects	• Improve overall international carbon market's quality • Open to other relevant sectors: forestry, building…

Facilitating efficient accounting for Article 6 adoption through UNDP and WB open-source national carbon registries

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UNDP - The Collective Issue of Climate Change Transparency

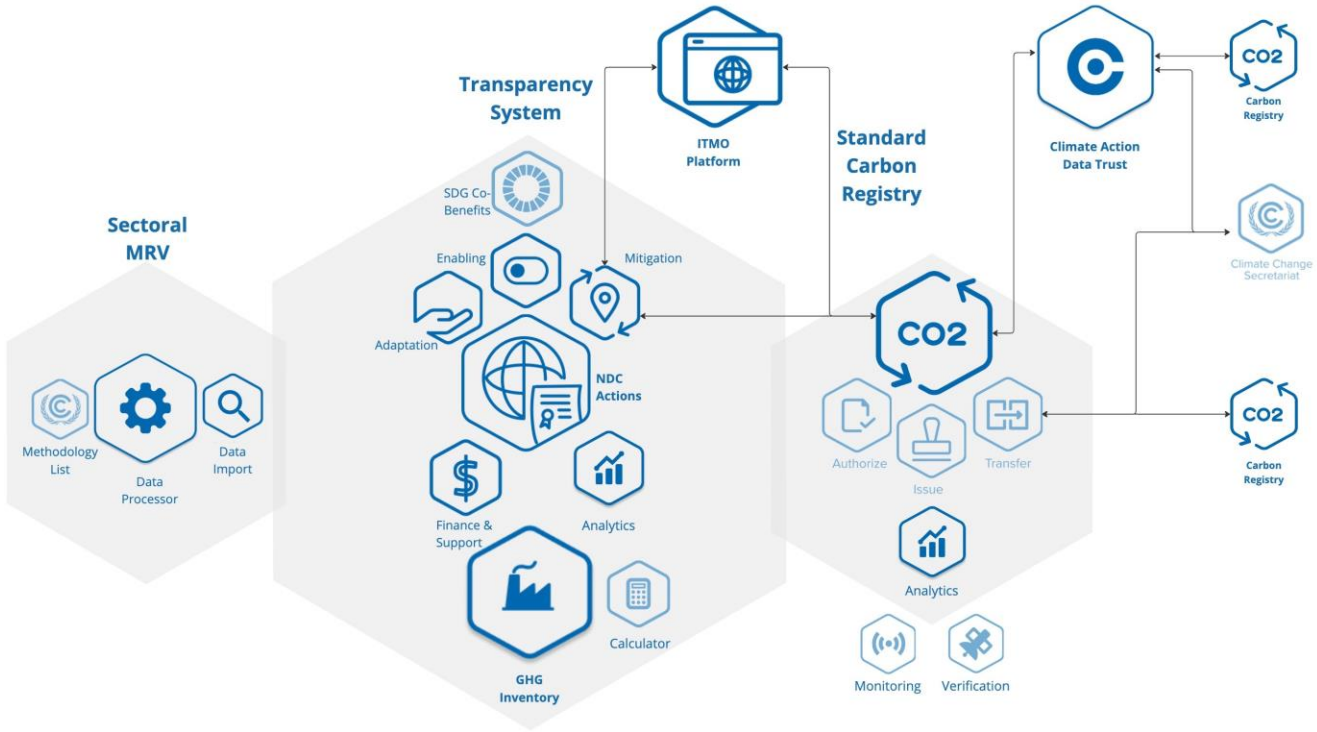
Managing data on GHG inventory, Nationally Determined Contribution (NDC) reporting requirements, and climate finance opportunities is **extremely challenging.**

UNDP in a unique position supporting 120+ countries on NDC implementation – noticed many countries expressing the need to develop **similar digital transparency systems**

Standalone development by each country lead to use of obsolete technology, vendor lock in and **duplicate effort** in similar systems

Transparency data require **interoperability** with other national and international systems, **difficult to solve by one country**

National Digital Transparency System as Digital Public Good



- **Collectively built** with inputs from 40+ countries and experts
- **Open-source national sovereign system** for any country to install and adapt
- National Carbon Registry and NDC Action Tracking, GHG Inventory for enhanced transparency
- **Facilitate Interoperability** with major platforms to enable end-to-end carbon trade, by choice
- Utilized in **Namibia, Indonesia**. Ongoing **Seychelles, CDI, Senegal…**

Continuing Collective Development

- **Digital Public Infrastructure** to enable innovation by local climate mitigation project developers and dMRV solution providers
- **Community of Practice** to co-design and promote South-south cooperation and to provide governance (40+ countries engaged)
- In partnership with Digital 4 Climate Working Group (UNFCCC, World Bank, EBRD, UNDP)
- **Code upgrade** following changing international requirements and evolving needs

World Bank - Core Registry: An Opensource Registry to Foster Capacity-Building

OBJECTIVE: The World Bank developed the **open-source Core Registry** with **core functionalities** aligned to **Article 6 requirements** and **automatic sync-in to the Climate Action Data Trust (CAD Trust).**

TRACKING AND ACCOUNTING FOR ARTICLE 6 REQUIREMENTS

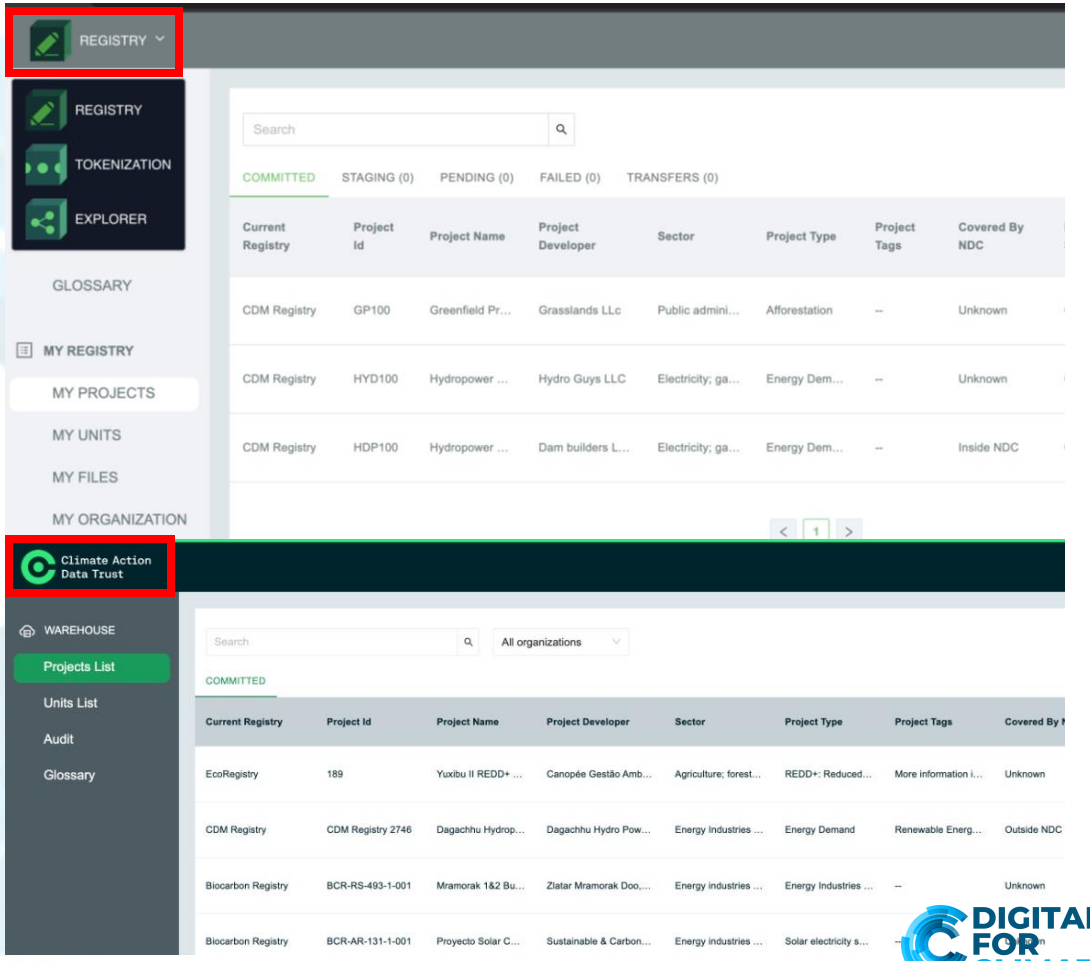
Leveraging common data model to aggregate and harmonize data from country registries through the Climate Action Data Trust

CREATION AND TRANSFER OF DIGITAL CARBON ASSETS TO ENHANCE TRANSPARENCY

Issuance and transaction of digital carbon credits

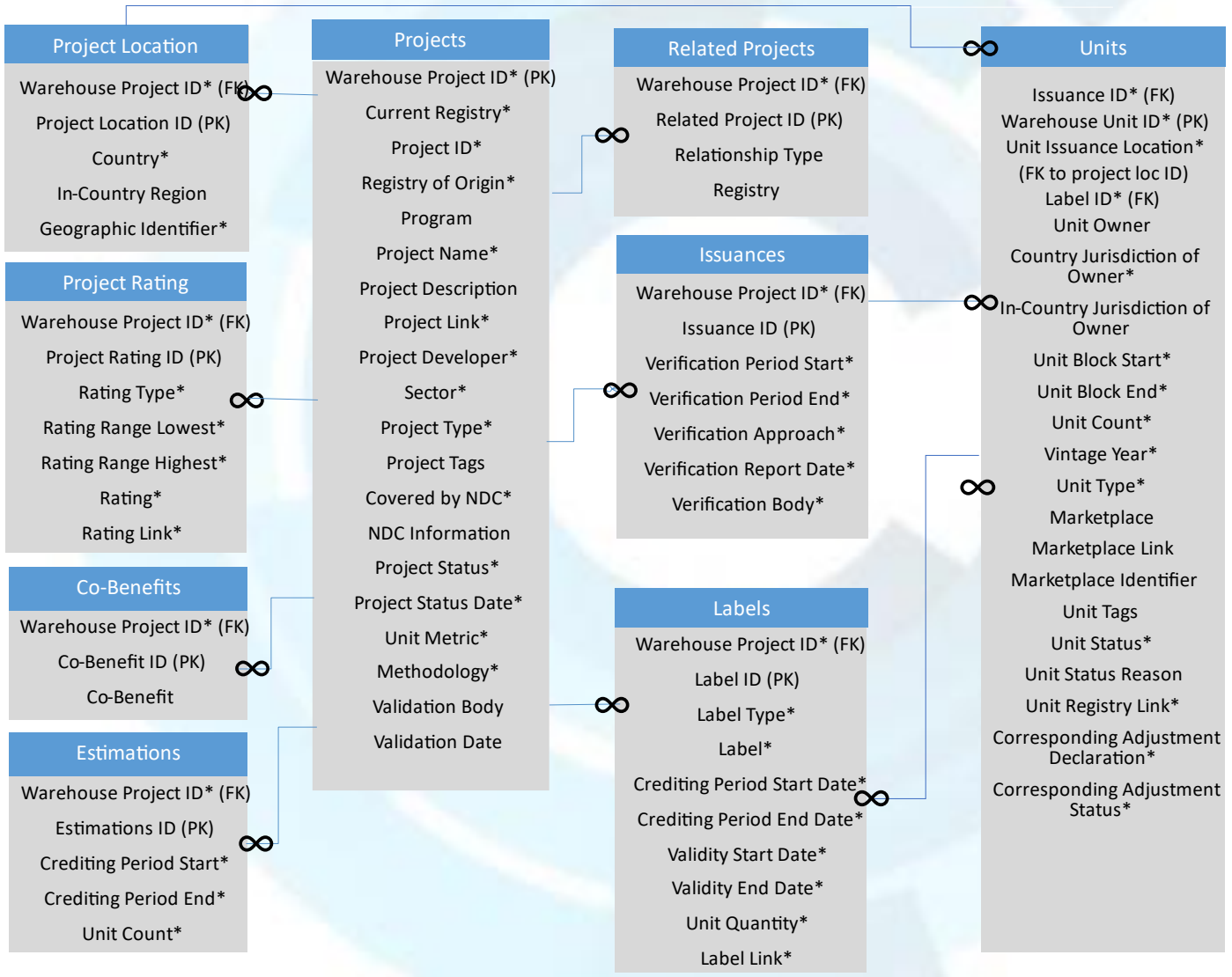
FOSTERING CAPACITY-BUILDING AND EXPERIENTIAL LEARNING

Learning between all actors involved on the needs, technical and functional requirements, and governance and business models



Tracking and accounting for article 6 requirements

Data Model of Core Registry and CAD Trust



Fields with an * are required form fields

PK denotes primary key for a specific table

FK denotes foreign key which links tables together

Governance (picklist values)

- Registry values
- Project Sector values
- Project Status values
- Project Type values
- Methodology values
- Unit Metric values
- Validation Body values
- Country values
- Rating Type values
- Unit Type values
- Unit Status values
- Corresponding Adjustment Declaration values
- Corresponding Adjustment Status values
- Related Project Relationship type values
- Label Type values
- Verification Body values
- Tag values
- Cobenefitvalues

Each ID is globally unique, meaning no organizations will generate the same ID for any table

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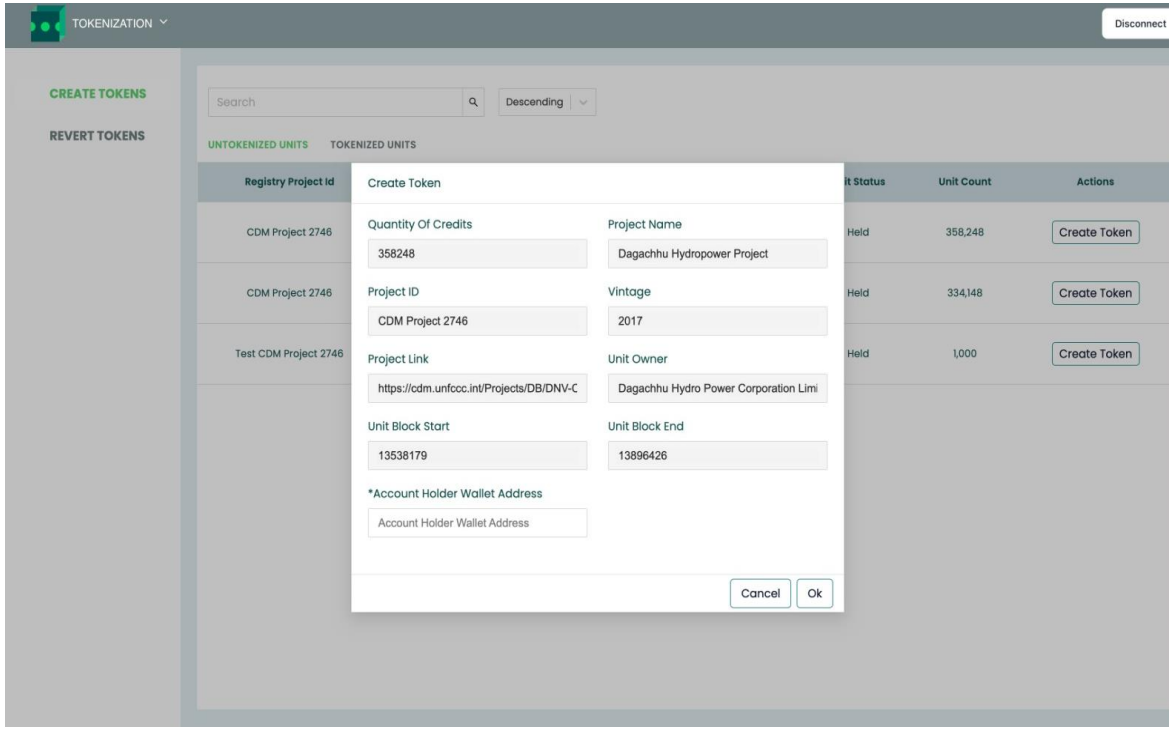
Issuance and Transfer of Digital Carbon Assets

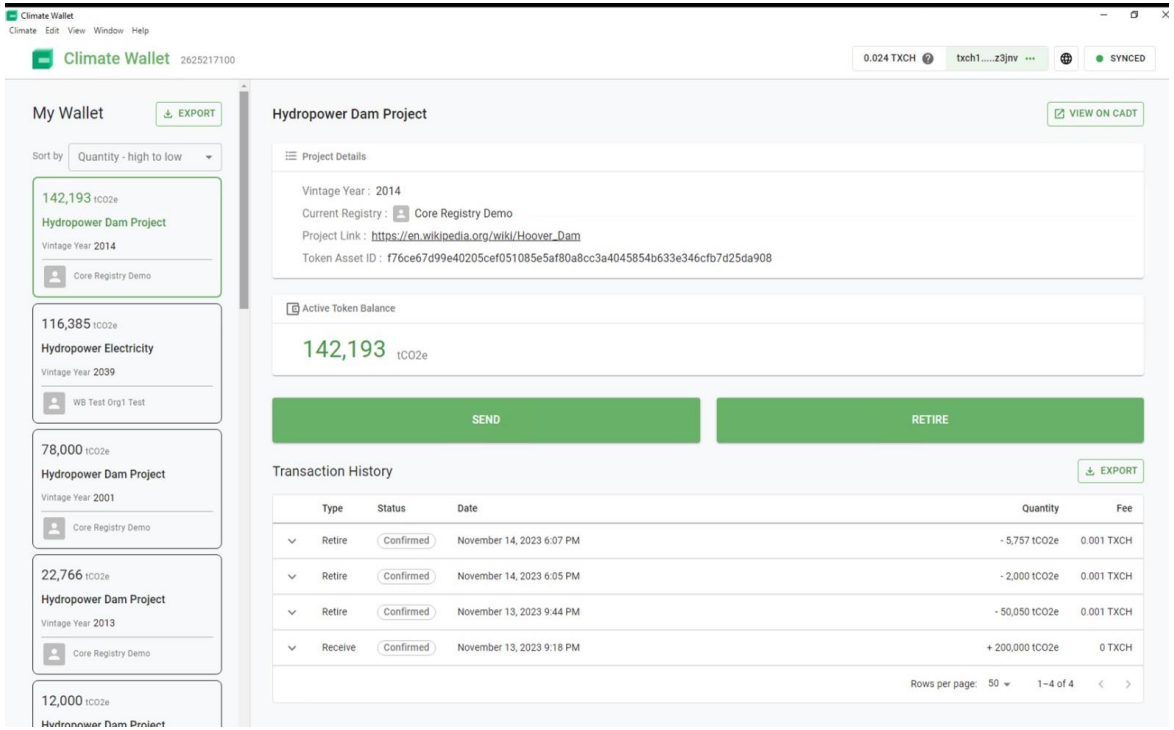
Converting traditional carbon credits into digital carbon assets using blockchain technology

Tokenization Engine



Engine enables converting carbon credits into digital carbon assets on a blockchain platform.

Wallets



Wallets are used to securely store, send, and receive the digital carbon assets – these being the digital record of carbon credits.

Early Observations of Carbon Markets Infrastructure Implementation

Technical and functional needs

- **Gaps and needs assessment:** assess the technical and functional requirements for registry and/or MRV systems; process management, accessibility and interoperability; data models and frequency, etc.
- **Best practices still to be established:** Few lessons learned about development and deployment of registry and MRV systems

Capacity-building needs: *testing, feedback collection, deployment*

- **Expertise requirements:** Assessing the technical skills and expertise required within the organization for adopting registry and MRV systems
- **Infrastructure requirements:** Conduct a comprehensive analysis of infrastructure requirements for the readiness of operating registry and MRV systems

Regulatory and policy requirements

- **Review the regulatory, administrative, and institutional landscape** related to registry and MRV systems. Assess the alignment of current policies with the goals registry and MRV systems adoption and identify implementation actions, as well as barriers or gaps that may hinder the transition

Implementation and deployment costs

- **Development Plans:** Assess whether to develop a new system, strengthen the existing one, or add new functionalities.
- **Deployment & Maintenance Requirements:** Determine the requirements for deployment and maintenance.

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CLOSING REMARKS

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IETA CLIMATE CHALLENGES MARKET SOLUTIONS