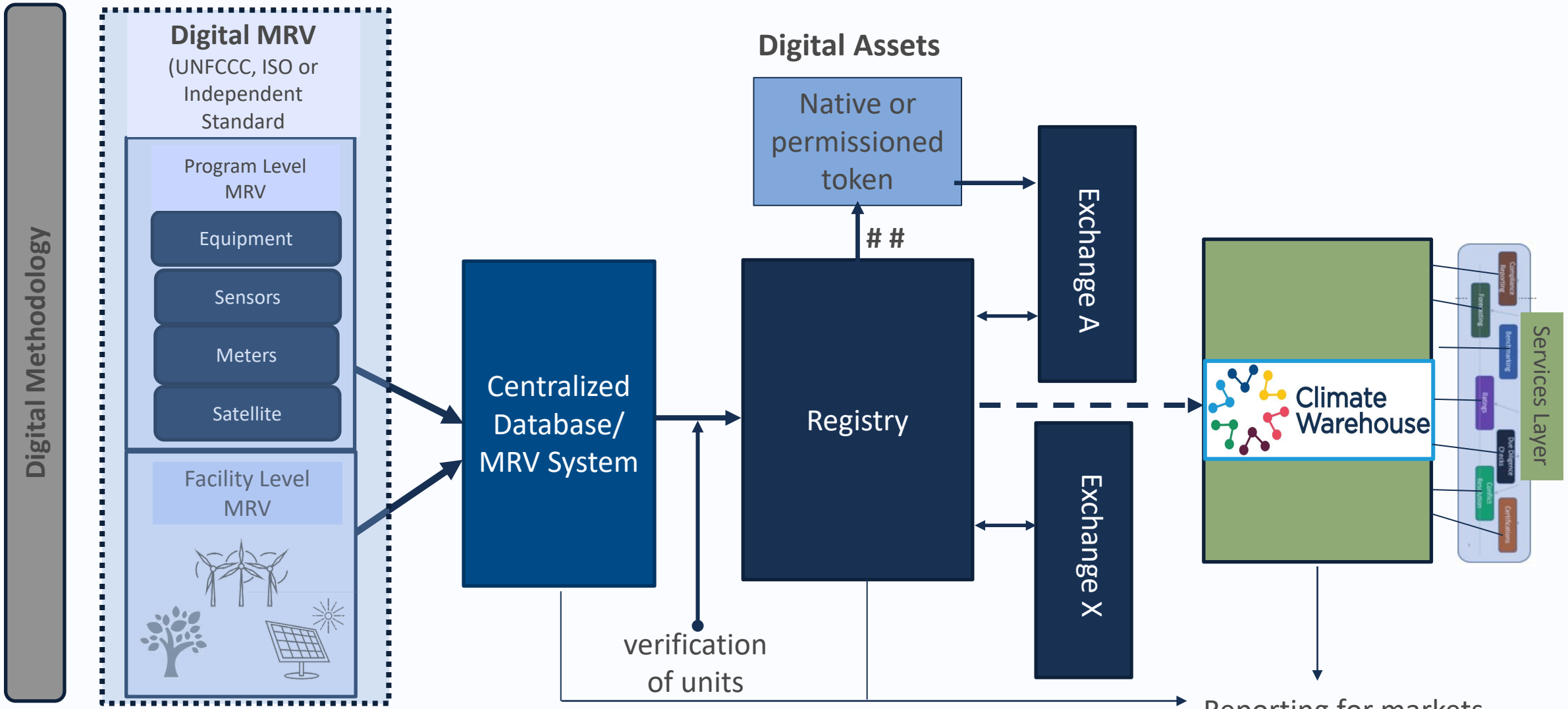
Climate Warehouse

End-to-End Digital Ecosystem for Climate Markets

July, 2022

WORLD BANK GROUP

End-to-end- digital ecosystem for carbon markets



Digital work-flow

project preparation from document development, approval, validation to registration in applicable standards

Digital for Climate (D4C) Collaboration: Working Group Collaboration Structure

Digital for Climate Collaboration

	UNFCCC	UNDP	European Bank for Reconstruction and Development	World Bank Group
D4C Offering	Digital Methodologies Program or National / Regional Authority Hub	Digital Work-flow for Project development Platform (carboncooperation.undp.org) Digital MRV Systems Vanuatu Registry Climate Action Impact Assessment Tool	Digital MRV System Facility-level MRV	Core Registry linked to the Climate Warehouse Enhanced Registry with integrated digital MRV and Climate Warehouse linkage

Implementation/ next steps

- **Develop a Concept Note** to guide the digital for climate collaboration working group
  - EBRD, UNFCCC and UNDP to provide the World Bank with a 1-2 page note describing relevant work
  - World Bank to consolidate into a Concept Note
- **Develop a Work Program** based on the Concept Note
  - Cadence: Meet every 2 weeks for the first 2-3 months, then switch to monthly meetings
  - Participants
    - > Working group members to identify other members in their organizations to join the Working Group meetings on a regular or ad-hoc basis
    - > World Bank / EBRD to identify any other MDBs interested in participating in the D4C collaboration
    - > Working Group to discuss the participation of any other institutions (e.g. GS, GCC, Verra, other standards, IETA's digital task force representatives)

CORE Climate Registry: National-level Registry in Sync with Climate Warehouse

The Key Features:

1. Project Developer Registration
2. Project listing, registration, validation and verification
3. Issuance process
4. Document upload and management
5. Climate Warehouse integration
6. Fee structure (except for fees for transfers & retirements)
7. Potential future scopes: Import & Exports, Digital MRV, etc.

Balance of Requirements for Each Country:

- IT Hosting & IT Management
- Internal processes to support registry operations including, the review & approval of project developers, project listing, registration, validation, verification, and issuance of offset credits.

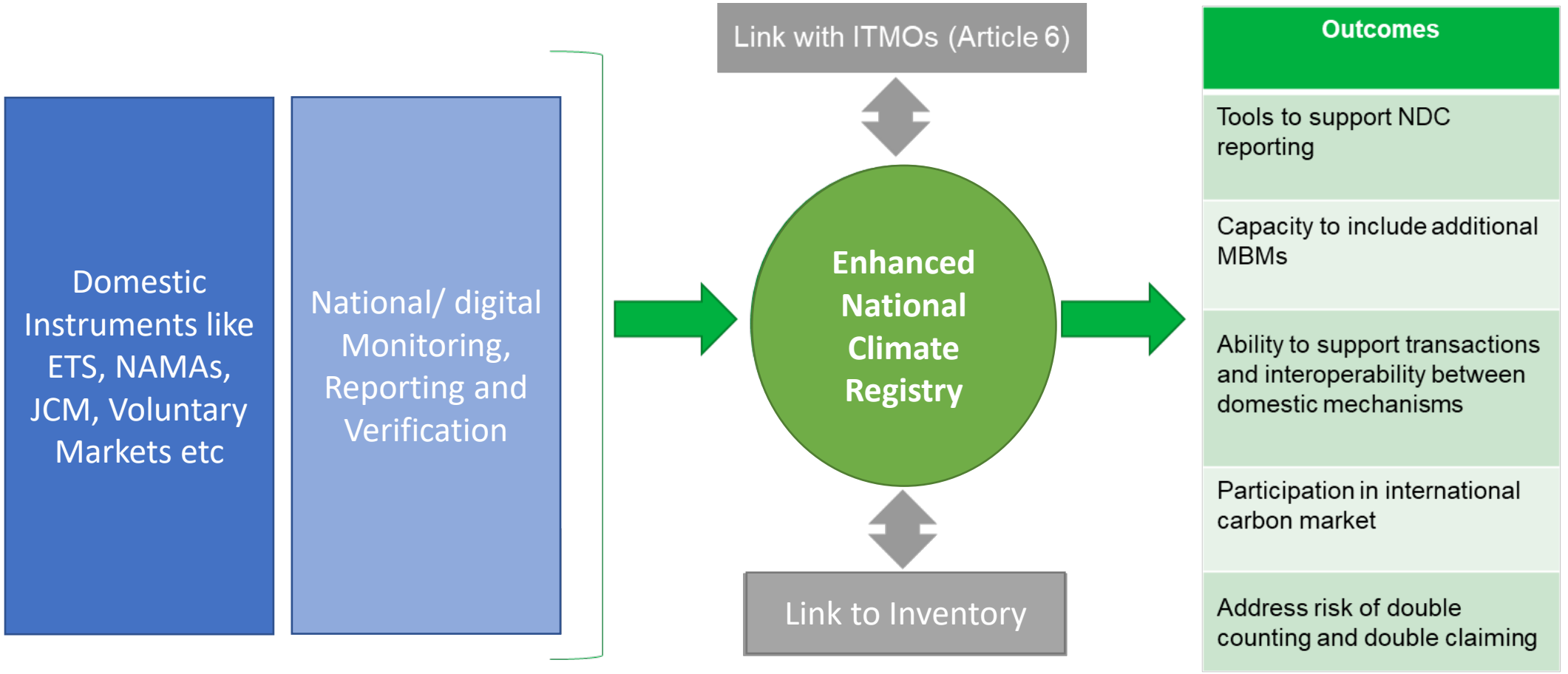
On the Chia Network Blockchain platform:

- Chia will provide implementation and customization services packages for each country-specific registry application

Additional On-chain Services to be Utilized:

1. Carbon tokenization: Tokenization Engine
2. Unit management, transfers and retirement: Climate Wallet
3. Reporting: Climate Wharehouse to Surfacing Information.
4. Potential to add functionality for periodic UNFCCC Reports

ENHANCED Climate Registry infrastructure to support domestic and international crediting market transactions



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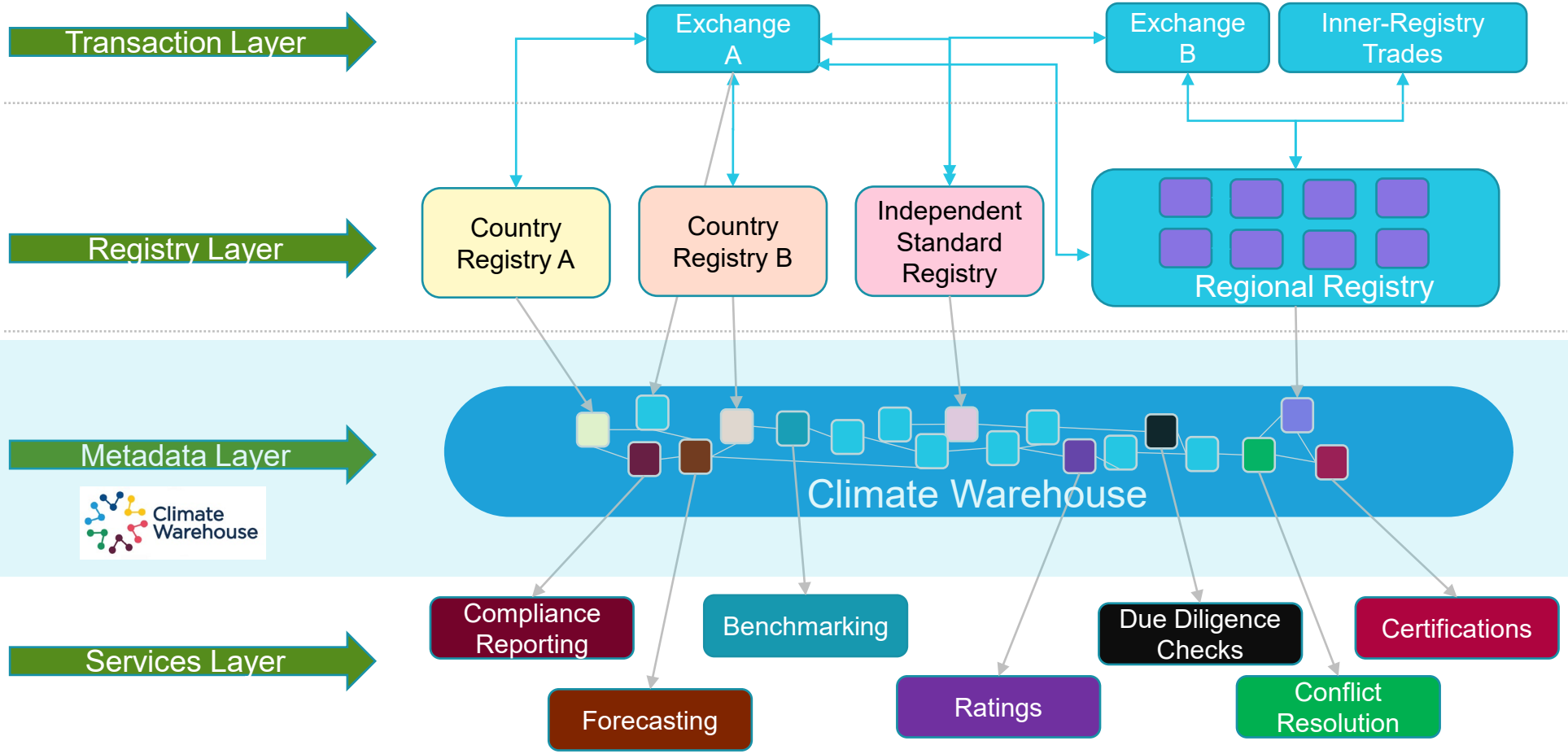
Climate Change

PMI
PARTNERSHIP FOR MARKET IMPLEMENTATION

Climate Warehouse meta data-layer deep-dive

Building a public good data layer

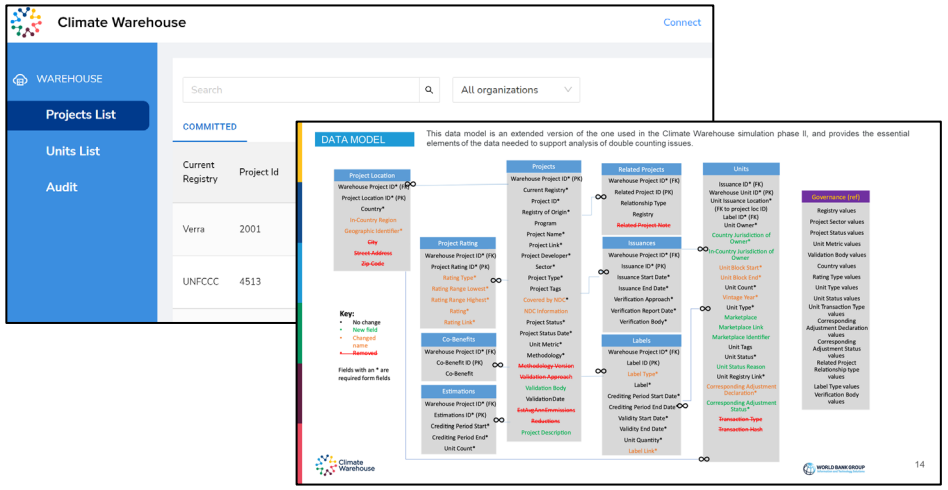
- Designed as an open shared infrastructure layer
- Common taxonomy of data facilitates communication between entities
- Registry service providers and countries share data to the Warehouse
- Public and private sector market players can host a node and build out the service layer



Prototype Architecture

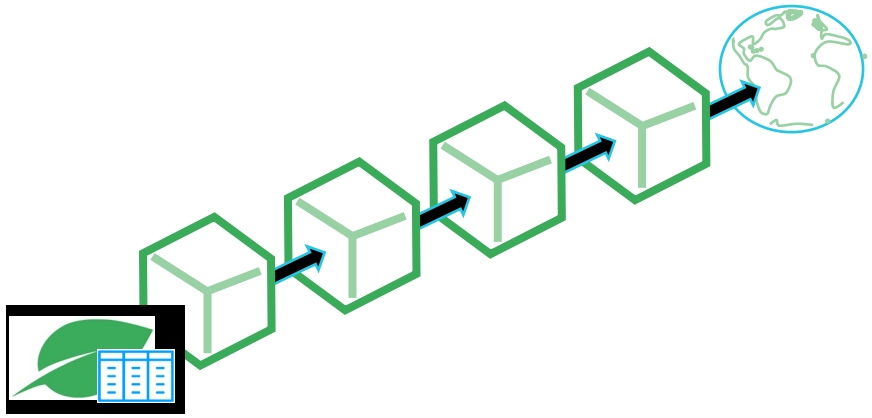
The Climate Warehouse infrastructure has 2 layers: the CW data layer and the public blockchain layer

Climate Warehouse Data Layer…



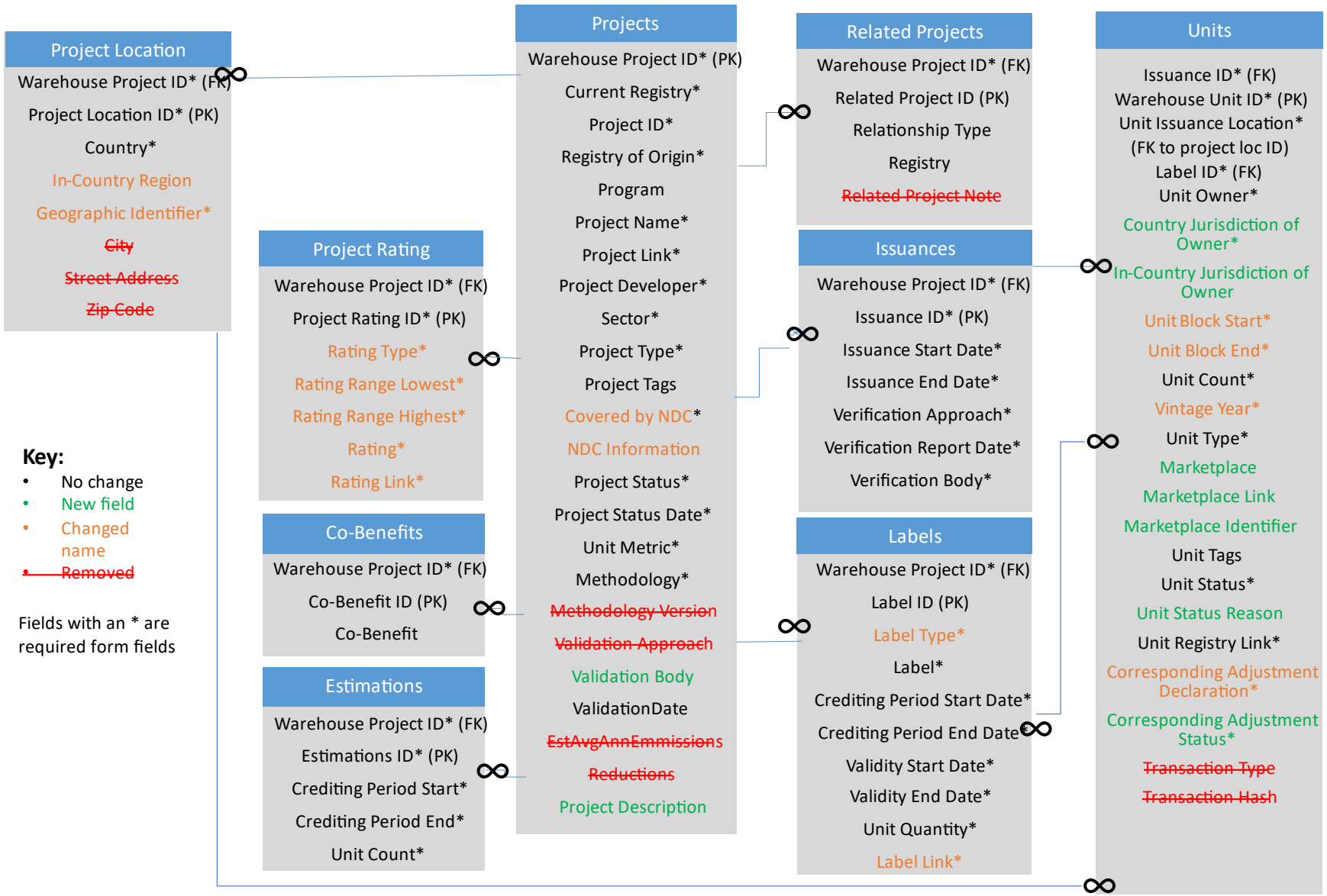
- Defines a common data model and taxonomy
- Reconcile data across registries
- Identify potential double counting
- Enable auditing and reporting

…Tested on a Public Blockchain Layer



- Traceable and Immutable Data
- Auditable
- Accessible and Inclusive
- Public and Transparent
- Open source
- Peer-to-peer governance

Data Model – Key Updates

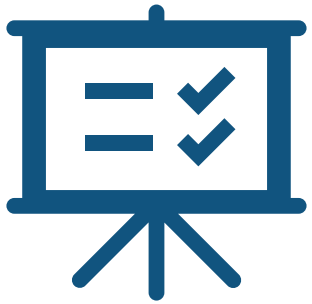


Goal and Scope of Work

Goal

Simulate how **participant registry systems can integrate** with the Climate Warehouse, upload data, and synchronize real-time changes to information

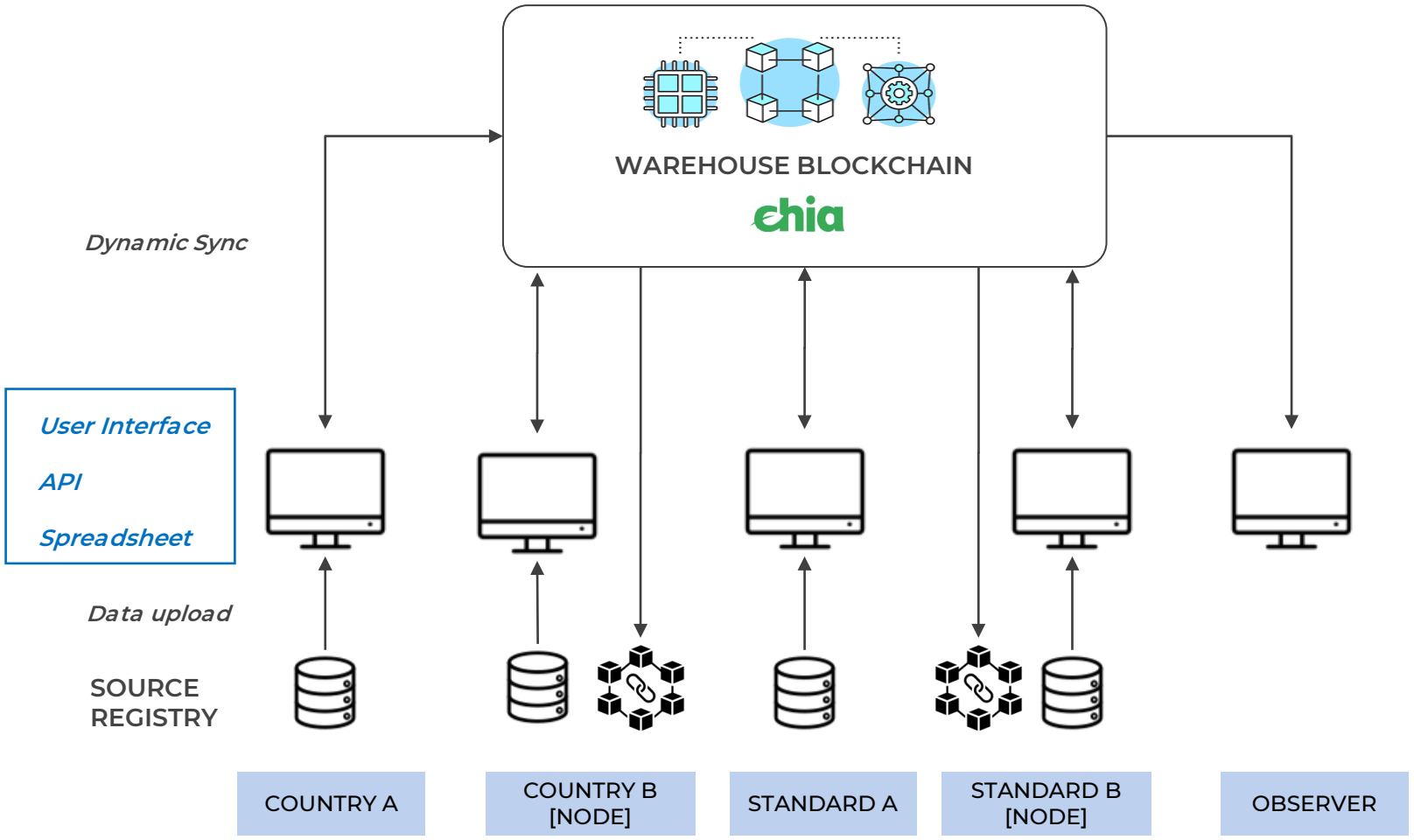
Scope of Work



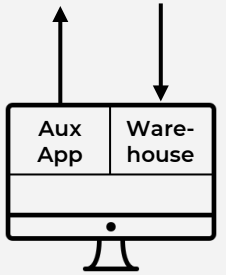
- Define **minimum standards for participation and technical infrastructure**
- Test and enhance the **data model and fields**
- Explore whether and how **public blockchain technology** meets the Warehouse requirements and allows for functions to **identify double counting and change MOs information in real-time**
- Test and enhance the user interface **(Auxiliary App)**
- Gather **feedback** and provide **capacity building support** and understand potential barriers to participation that need to be overcome in an operational phase
- Prepare a **summary report**, including climate change and technology findings and recommendations based on the collected feedback

Prototype Architecture

There are three ways to integrate data into the Climate Warehouse: User Interface, API and Spreadsheet import/export



User Interface



The Warehouse web application has two main interfaces with the blockchain. One is the Auxiliary App, which helps *Integrated Participants* manage their data sync and entry point into the Warehouse. The other is a tab that showcases the data in the warehouse blockchain. *Node Participants* hold a full copy of the blockchain via direct integration. *Observer participants* view the Warehouse data via an Auxiliary App made available by the WBG.

Testing Activities

Phase I

Phase II

Phase III

Phase IV

Group 1 (Internal Testing)

- WB CMI
- WB CATS

Observers:
- IETA
- Open Earth Foundation

March - April 2022

Group 2

- Sweden
- Switzerland
- Chile
- Japan
- Singapore
- Gold Standard
- VERRA
- CAR
- ACR
- GCC

Observers:
- Spain
- UNFCCC
- EBRD

April – May 2022

Group 3

- Rwanda
- Bhutan
- Senegal
- Ghana
- Mexico
- Peru
- Colombia
- Uganda
- Eco-registry Colombia
- BV Rio
- Bangladesh

Observers:
- Climate Ledger Initiative
- Climate Impact X
- Climate Chain Coalition
- Temasek
- AirCarbon
- CBL

May – July 2022

Feedback Consolidation and Documentation

- **Capture feedback in 5 tools:**
  - Feedback notes
  - Test scripts
  - Action items tracker
  - Feedback survey
  - Participant profiles
- **Produce documentation:**
  - Simulation III Final Report
  - Transition Plan
  - Onboarding Operational Climate Warehouse Package

July - August 2022

**These groupings may be subject to change due to availability and preferences of participants

Lessons Learned

Initial insights from simulation III testing

Simulation III scope

- Sim III **pushes participants to envision an interconnected ecosystem**, beyond their own standalone system
- Data added to the Climate Warehouse must be able to **bridge process flows across participants**
- Participants must validate the Climate Warehouse's level of **data granularity, status information and units transfer methodology**

Benefits & Feedback

Benefits

- Increased transparency and data sharing
- Addressing double counting risks across registries
- Identifying a common data model
- Interaction with experts across registries
- Ability to access information outside of their own systems

Feedback

- Difficulty defining minimum standards needed to link registries
- IT complexity, upgrades to existing systems, building integration
- Ability to connect regional registry systems
- Multiple groups within the same organization will need to coordinate and play a role

3 types of experts are needed

Policy Setter

- Provides policies, guidelines, strategy for implementing, projections on future impacts on the inner workings of the organization
- Needs to understand how the data will be used internally and by partners in the future, what changes need to occur for this to happen, and what is possible due to technology advances.

Registry Administrator

- Create procedures for implementing policies
- Needs to understand how workflows will change in the future, implications for their technology tools and the data that needs to be available and captured.

IT Support

- Ensure data structure and registry functions are fit for purpose
- Needs to understand direction of policies, field definitions to figure out equivalencies for integration.

Insights by Climate Warehouse Stakeholder Entities: Benefits

Stakeholder type	Benefits
Governments	• Increases visibility and credibility of a country's climate activities • View MOs to potentially purchase • Promotes new project activity • Can increase market participation of private sector • Can provide an aggregate view of projects within their jurisdiction, ability to identify duplicative projects • Increases accountability
Independent Standards	• Reduces burden on monitoring external systems for due diligence processes because of the ease of aggregating information together • Facilitates trust and transparency between systems
UNFCCC	• Aggregate reporting
Exchanges	• Decreases market fragmentation and eases integration • Promotes standardization and asset integrity • Adds information security to the data needed from registries for transactions • Increases volume of standard asset types
Project Developers	• Building trust in the accounting of MOs will enable transparency and trade, benefiting project developers
Verification Bodies	• Access to aggregated information, ability to audit transactions and changes to data
Buyers and Traders	• Aggregated trustworthy data to search through. Easier access to project developer information

Climate Warehouse Governance

- Consultations process and results
- Interim structure and model
- Next steps

Governance and Finance consultation
September 2021 – March 2022

70+

Entities involved

- Governments
- Independent standards
- Exchanges
- Traders
- Project developers
- Private sector
- Financial institutions
- Technology providers
- NGOs
- Think tanks
- Law firms
- Multilateral development banks

- Observer: UNFCCC

5

Governance models reviewed

- Western Climate Initiative, Inc (WCI, Inc.)
- Integrity Council for Voluntary Carbon Markets (IC-VCM)
- EU-Swiss ETS link
- Joint Crediting Mechanism (JCM)
- British Standards Institution (BSI) & Enterprise Singapore (ES)

6

Focus groups conducted

- 4 on governance (46 entities)
- 2 on finance (45 entities)

+ polls and surveys for participant feedback throughout

Learnings and working recommendations

Identified priority missions

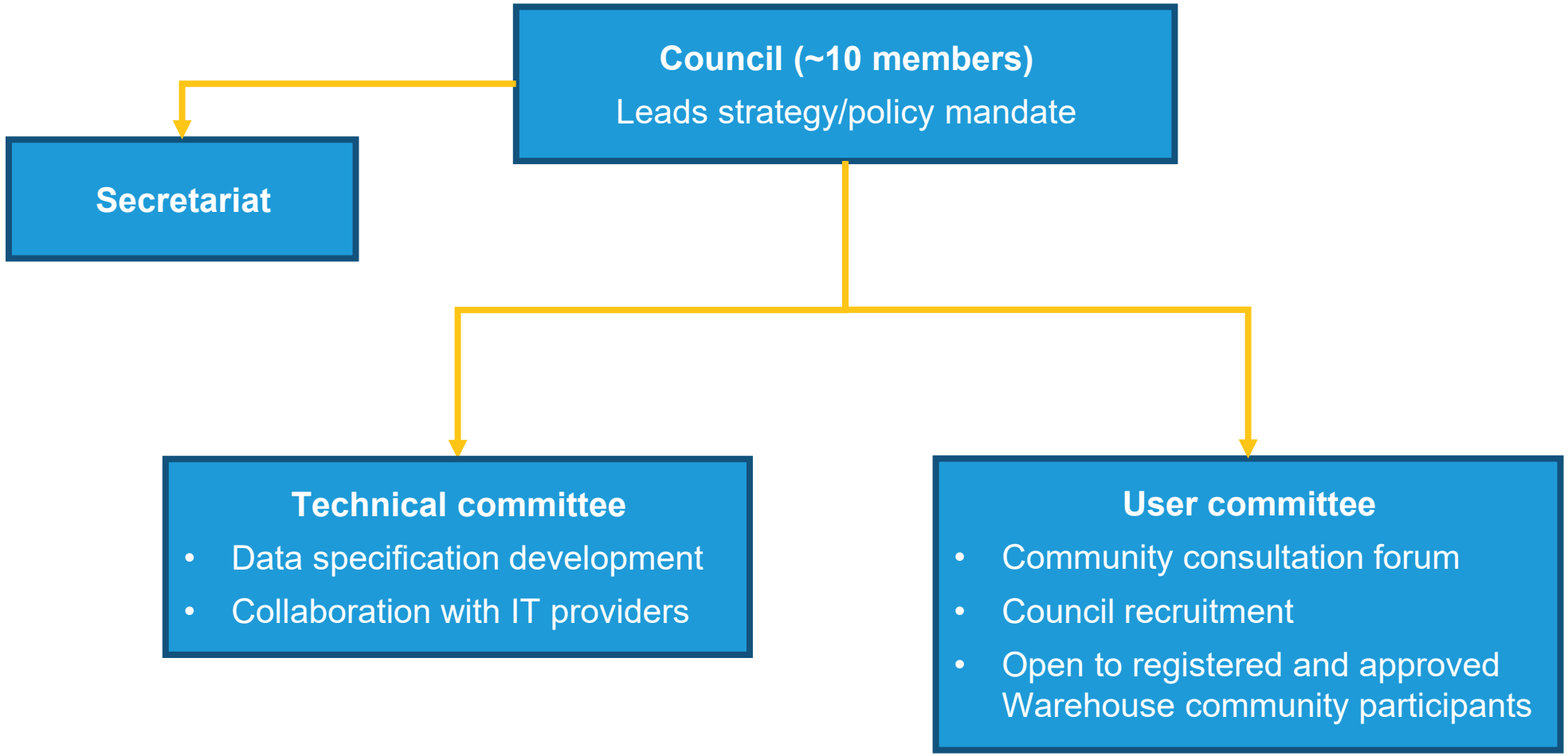
1. Bring transparency to the market:
   - mitigation outcomes
   - carbon credit lifecycle
   - corresponding adjustments
2. Reduce risk of double counting
3. Enable carbon market services built on comprehensive, real-time data

Recommendations

- Deliver **unified data reporting specifications** for all carbon crediting programmes, potentially as an (inter)national standard
- Encourage **wide programme participation** in the public blockchain to track unit data
- **Efficient, yet consultative governance**: collaboration between governments, VCM standards, and carbon market participants
- Use **grants** to enable a public good service first and aim for **eventual financial sustainability**

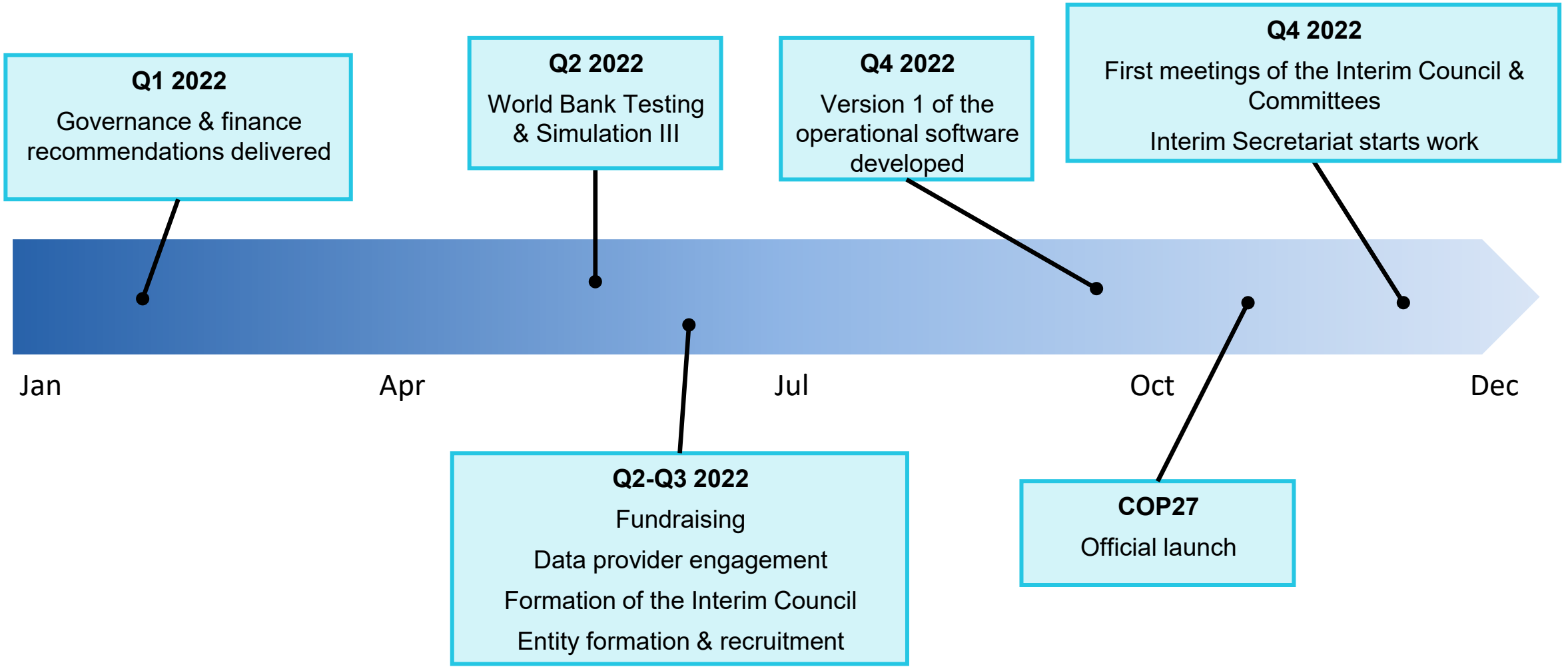
Proposed governance model

2023-2024: Interim Period
2025+: permanent governance



Next steps

2022 “inception phase” work program



Thank you

Climate Warehouse

For further information:

http://www.theclimatewarehouse.org

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