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América Latina y Caribe

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On behalf of:
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
of the Federal Republic of Germany

Potentials of Blockchain for Climate Policy Instruments in Latin America

October 4th, 8:30-10:30 CDT / 15:30-17:30 CET

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AGENDA

Time	
08.30-08.40	**Introduction** *Juan Carlos Arredondo, Director General for Climate Change Policies at Secretariat of Environment and Natural Resources (SEMARNAT), Mexico* *Miriam Faulwetter, Project Director "Prepraration of an Emission Trading System in Mexico" – GIZ Mexico*
08.40-09.00	**Blockchain and climate change** *Sven Braden, independent consultant and representative of Climate Ledger Initiative*
09.00-09.20	**Linking carbon markets via Art. 6 of the Paris Agreement** *Juerg Fuessler, Managing Partner INFRAS and representative of Climate Ledger Initiative, Zurich*
09.20-09.35	**Questions and Answers**
09.35-10:20	**Regional experiences on climate and Blockchain** **09.35** Introduction to GIZ´s sectoral network (GADERALC) and workstream on blockchain. *Ximena Aristizabal and Kathrin Ludwig – GIZ Mexico* **09.40** Mexico: Blockchain for carbon markets and transparency systems. *Sven Braden, independent consultant and representative of Climate Ledger Initiative* **09.50** Costa Rica: Blockchain in the coffee sector. *ORUKA consultants* **10.00** Brazil: Blockchain in the cattle and fishery sector. Doerte Segebart, Project director "Integrated management of marine and coastal biodiversity" – GIZ Brazil **10.05** Peru: Blockchain and climate finance. *Christian Hübner, Head of Regional Programme Energy Security and Climate Change Latin America - Konrad-Adenauer-Stiftung e.V.*
10.20-10.30	**Questions and Answers - Closure**

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Words of Welcome

Juan Carlos Arredondo

Director General for Climate Change Policies at Secretariat of Environment and Natural Resources (SEMARNAT), Mexico

Miriam Faulwetter

Project Director “Prepraration of an Emission Trading System in Mexico” – GIZ Mexico

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Introduction to Blockchain and applications to climate policy

Sven Braden,

Independent consultant and representative
of Climate Ledger Initiative

“Blockchain-based solutions for climate policy in Latin America”

Blockchain and Climate

Sven Braden/Climate Ledger Initiative

Date: 04.10.2018

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Climate Ledger Initiative (CLI)

CLIMATE | LEDGER INITIATIVE

Mission: to accelerate the momentum for climate action under the Paris Agreement by fostering the use of the emerging blockchain technology.

CLI's activities focus on

- **Research**
- **Innovation use cases**
- **Support of Innovation**

CLI is supported by the Government of Switzerland, the Government of Liechtenstein and EU's Climate-KiC, www.climateledger.org

The CLI is jointly operated by: Cleantech21 Foundation, LIFE Climate Foundation, INFRAS and the Gold Standard Foundation.

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Blockchain Technology and Climate Change….

Climate

1. World's key challenge, urgent
2. Lack of ambition, #Paris implementation
3. New rules, transparency & stakeholder integration challenges

>> Innovation need & potential

Blockchain

1. One of the world's most high potential technologies
2. Trust & governance attributes in line with UN-type processes/challenges
3. Specific potential in climate mitigation, adaptation & finance

>> High-potential Innovation option

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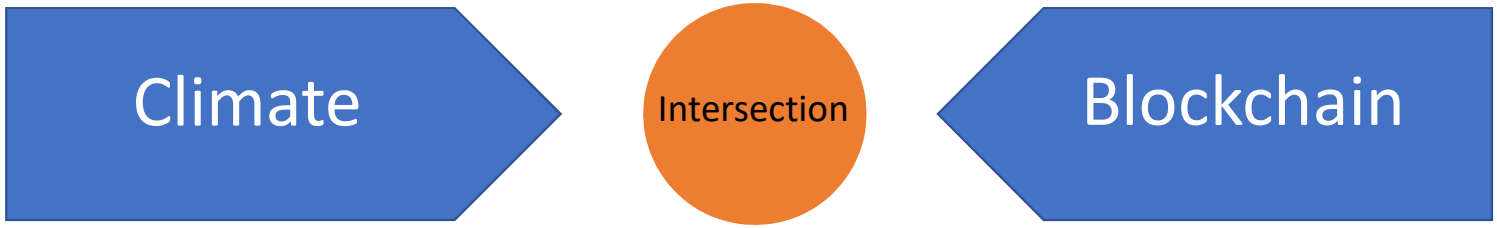
Blockchain Technology and its POTENTIAL for Climate Change….



1. Raise ambition for climate mitigation, adaptation & finance
2. Accelerate Paris implementation with specific climate action in line with UNFCCC/IPCC
3. Streamline processes, increase transparency & improve stakeholder integration
4. Convene innovators, facilitate knowledge sharing & engage new as well as existing actors
5. Promote blockchain-based climate innovation & mobilise talent for high-impact climate action

Example: The Paris Agreement and Blockchain Technology

Characteristics of Paris Agreement

- Transparency as key pillar of PA
- De-centralized, bottom-up approach
- Important role of measuring, accounting, tracking, reporting
- Exchange of information and review
- Important role of private sector players

Risks: Lack in ambition levels and transparency, slow progress

Features of Blockchain Technology

- De-centralized notary, also for small systems
- Brings trust to peer-to-peer interactions
- Accessibility and distributed systems
- Increased transparency
- Permanent ledger
- Efficiency – Smart contracts

Risks: pilot/ demonstration stage, complex, high power consumption, only a hype?

Source: Climate Ledger Initiative

Innovation Use Cases

Five use cases as part of the CLIMATE LEDGER INITIATIVE

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Climate-Blockchain Innovation Call-out (CBC) - bringing climate and blockchain communities for innovation to emerge

Clean coin - climate implications of cryptocurrencies and developing prototype tools to calculate and mitigate emissions generated

LET Chain - software architecture for designing efficient and transparent mobility policy solutions for governments and businesses.

REDD Chain - innovative monitoring, reporting, and verification (MRV) service linking finance to REDD+ (UNFCCC/LULUCF)

Carbon Cockpit – making corporate carbon management (carbon tracking, reporting, target setting and identification of mitigation options) easier, cheaper and more effective through blockchain.

eit Climate-KIC Cleantech21 south pole group ETH zürich Quantis Gold Standard

Source: Climate Ledger Initiative

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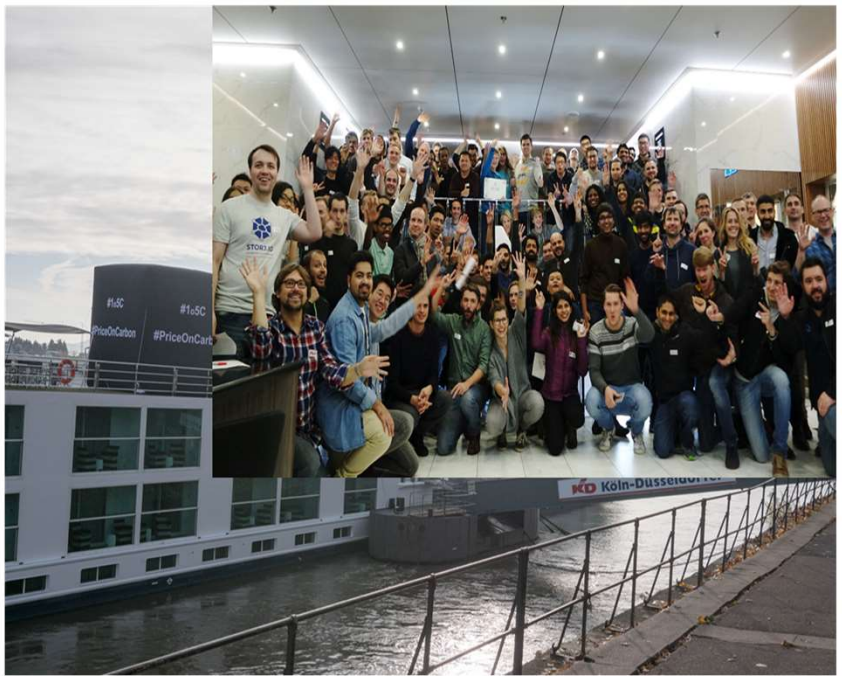
Support of Innovation

Support of activities that raise awareness, build capacity, convene and mobilise climate and DLT talent, select talent in hackathons

Source: Climate Ledger Initiative

#Hack4Climate organised by Cleantech21 during COP23 in Bonn, Germany with 100 participants from 33 countries, 17 preparatory workshops in blockchain hubs around the world engaging1'300 developers



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Blockchain Technology and Climate Change – developments

2017: IBM and the **China-based Energy Blockchain Labs** announced they are developing a carbon asset management platform for China, planning to be used with the national ETS.

2017: AiraLab and **Microsoft Russia** to start blockchain platform for carbon credit trading. The trading platform allows private companies to purchase and sell carbon credits.

2018: "Paris Rule Book" for implementing the Paris Agreement is currently negotiated by more than 190 countries – Blockchain / DLT is considered an option for market based mechanisms Post 2020

2015 - 2017: Solarcoin / Climate Coin / CarbonX – Issuance of specific cryptocurrencies earmarked for measures to combat climate change and / or to support deployment of renewable energies

2017 / 2018: At UN climate negotiations countries acknowledge the potential role of blockchain / DLT for Paris Implementation in their official submissions: Switzerland, Liechtenstein, Korea, Mexico, Costa Rica for AILAC, Norway, Ethiopia for the Group of Least Developed Countries

Thank you!

Sven Braden / Climate Ledger Initiative

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Linking carbon markets via Art. 6 of the Paris Agreement

Juerg Fuessler,

Managing Partner INFRAS and representative of Climate Ledger Initiative, Zurich

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Enabling Climate Action and Carbon Markets with Blockchain

Juerg Fuessler, INFRAS and Climate Ledger Initiative
Webinar on «Blockchain-based solutions for climate policy in Latin Amreica», 4 October 2018

Content summary

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- **Paris Agreement is different**: a more bottom-up, party driven approach, and for the first time (almost) **all parties** committed (NDC)
- This strengthens sovereignty but leads to **challenges for tracking and bookkeeping of progress** in climate action
- **Blockchain technology** fosters **integration** of (jurisdictional) bookkeeping systems in trusted **registry ecosystems**, overcoming these challenges and **catalyzing** Paris Agreement **implementation** by public and private entities
- **Blockchain technology** brings **efficiency gains** in implementing PA
- Two examples: carbon markets transfers and digitizing MRV

Climate Ledger Initiative (CLI)

Mission: to accelerate the momentum for climate action under the Paris Agreement by fostering the use of the emerging blockchain technology.
CLI's activities:

- **Analysis and research**
- **Innovation use cases**
- **Platform for exchange and joint learning – focus on policymakers**

Supported by Government of Switzerland, the Government of Liechtenstein and EU's Climate-KiC. climateledger.org

Collaboration with Network of partners including UNFCCC Sec., World Bank
The CLI is jointly operated by: Cleantech21 Foundation, LIFE Climate Foundation, INFRAS and the Gold Standard Foundation.

Release COP Katowice 2018: *Navigating Blockchain and Climate Action Report*

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The Paris Agreement and Blockchain Technology

Source: UNFCCC.int

The Paris Agreement and Blockchain Technology

Characteristics of Paris Agreement

- De-centralized, *hybrid* bottom-up *and* top-down approach
- **Transparency** as key pillar of PA
- Important role of measuring, accounting, tracking, reporting
- **Exchange of information** and review
- Important role of **private sector players**

Risks: Lack in ambition levels and transparency

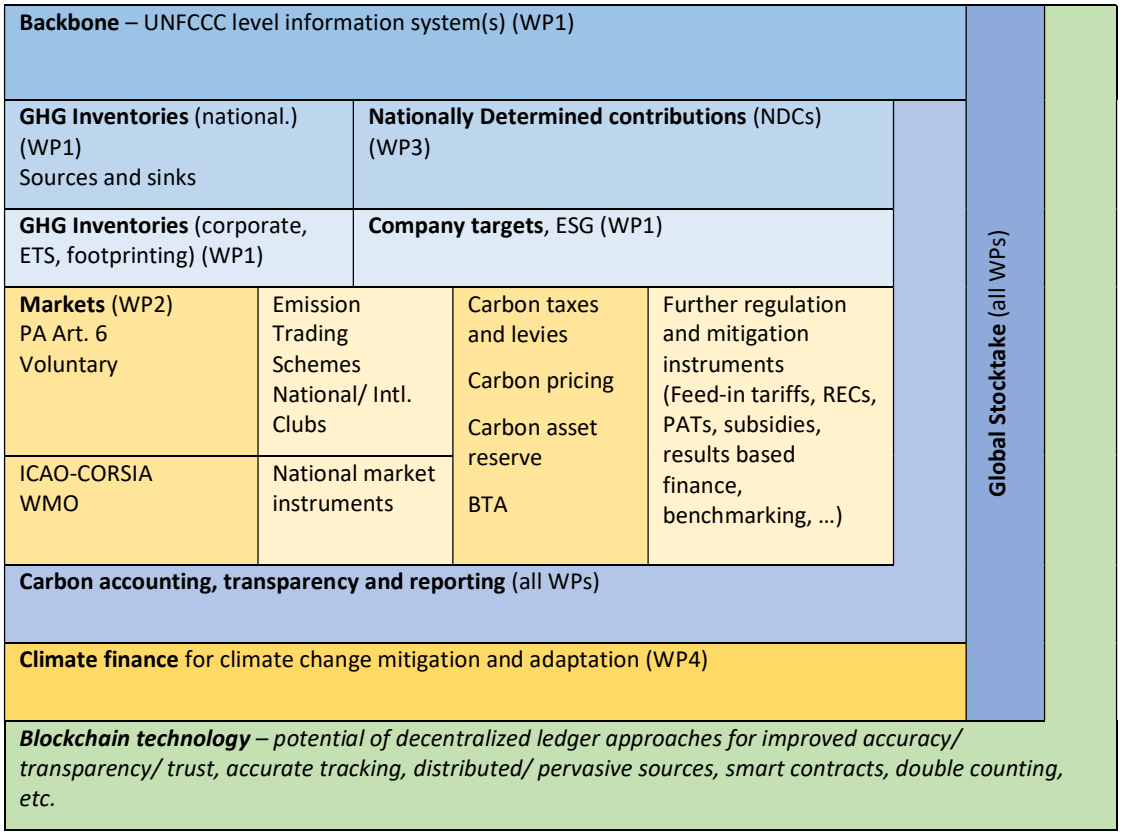
Features of Blockchain/DLT Technology

- De-centralized notary, also for small systems
- Brings trust to peer-to-peer interactions
- Accessibility and distributed systems
- Increased transparency
- Permanent ledger
- Efficiency – Smart contracts
- Public / permissioned blockchain

Risks: pilot/ demonstration stage, complex, high power consumption, only a hype?

Source: Climate Ledger Initiative

CLI Research: What is the potential of blockchain technology for climate action and the implementation of the Paris Agreement?



Source: Climate Ledger Initiative

Elements of Climate Action under Paris Agreement

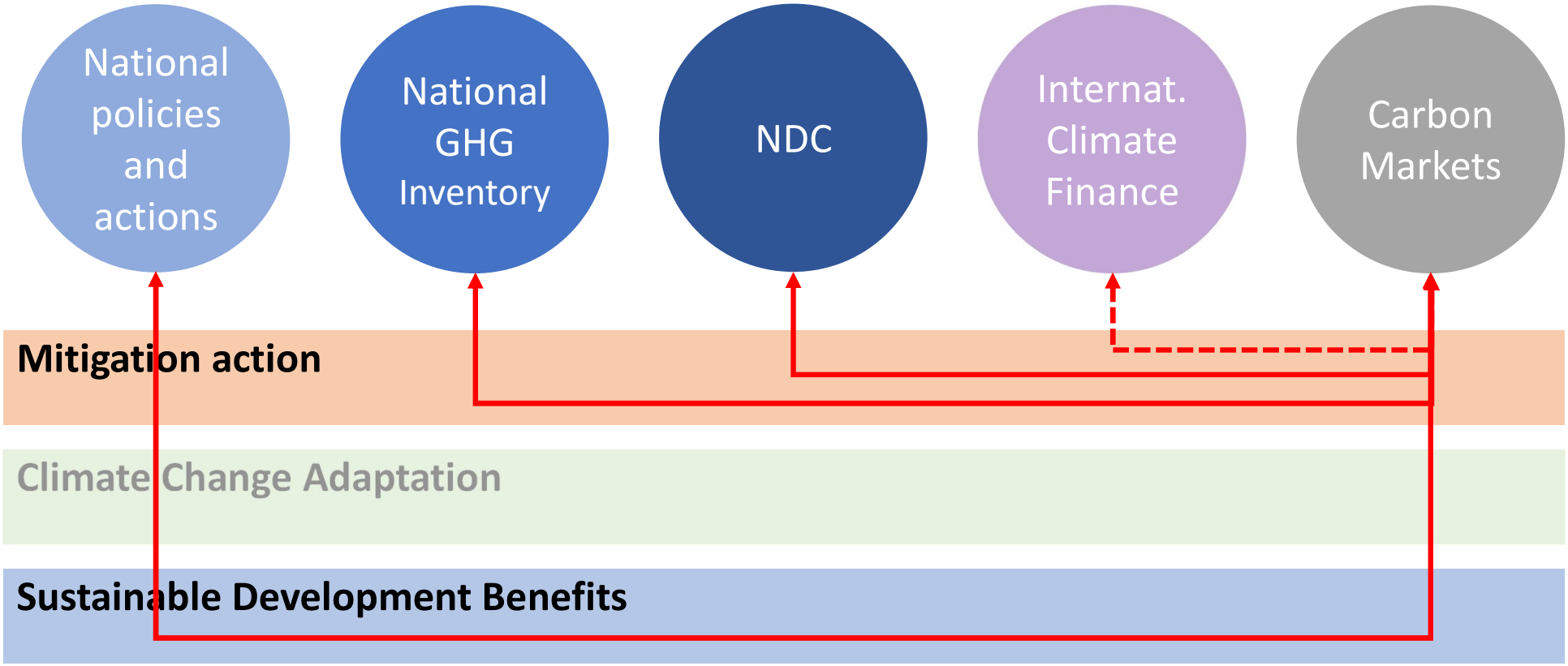
Mitigation action

Climate Change Adaptation

Sustainable Development Benefits

Source: Climate Ledger Initiative

Example 1: Art.6 carbon markets transfer impacts multiple ledgers



Source: Climate Ledger Initiative

Illustration: Possible corresponding adjustment under Article 6 mechanism

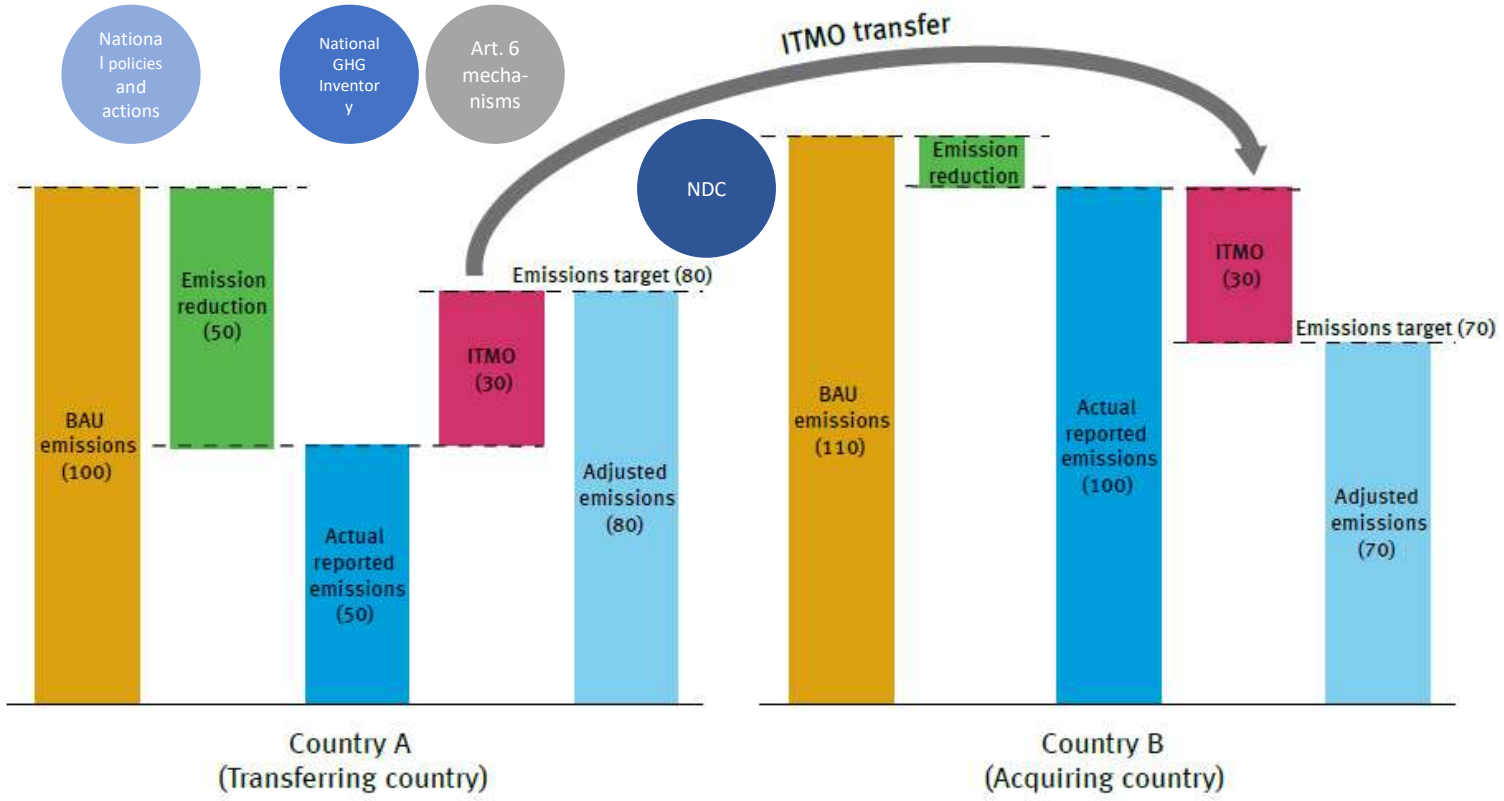


Figure 1: Application of corresponding adjustments to reported emissions

Source: Adapted from Scheider, Fuessler et al. (2017) *Robust Accounting of International Transfers under Article 6 of the Paris Agreement.* UBA

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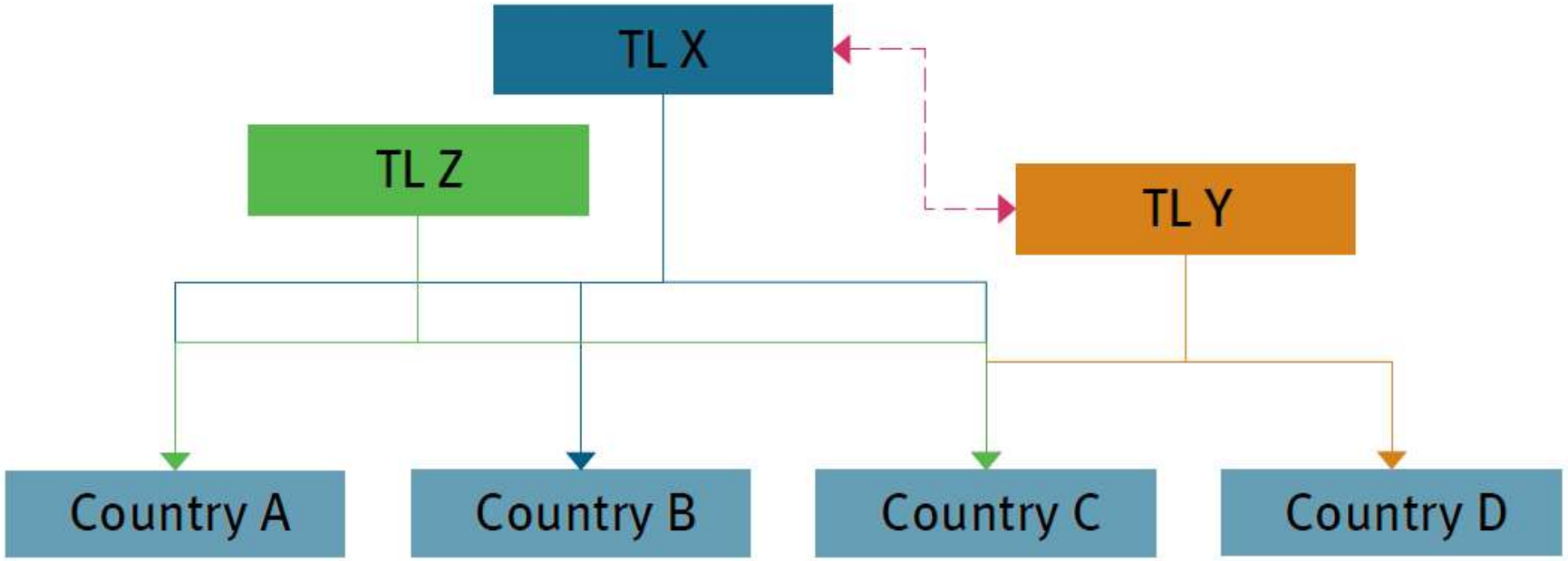
Multitude of Transaction Logs (Databases) need to interconnect



Source: Schneider, Fuessler et al. (2017) *Robust Accounting of International Transfers under Article 6 of the Paris Agreement.* UBA

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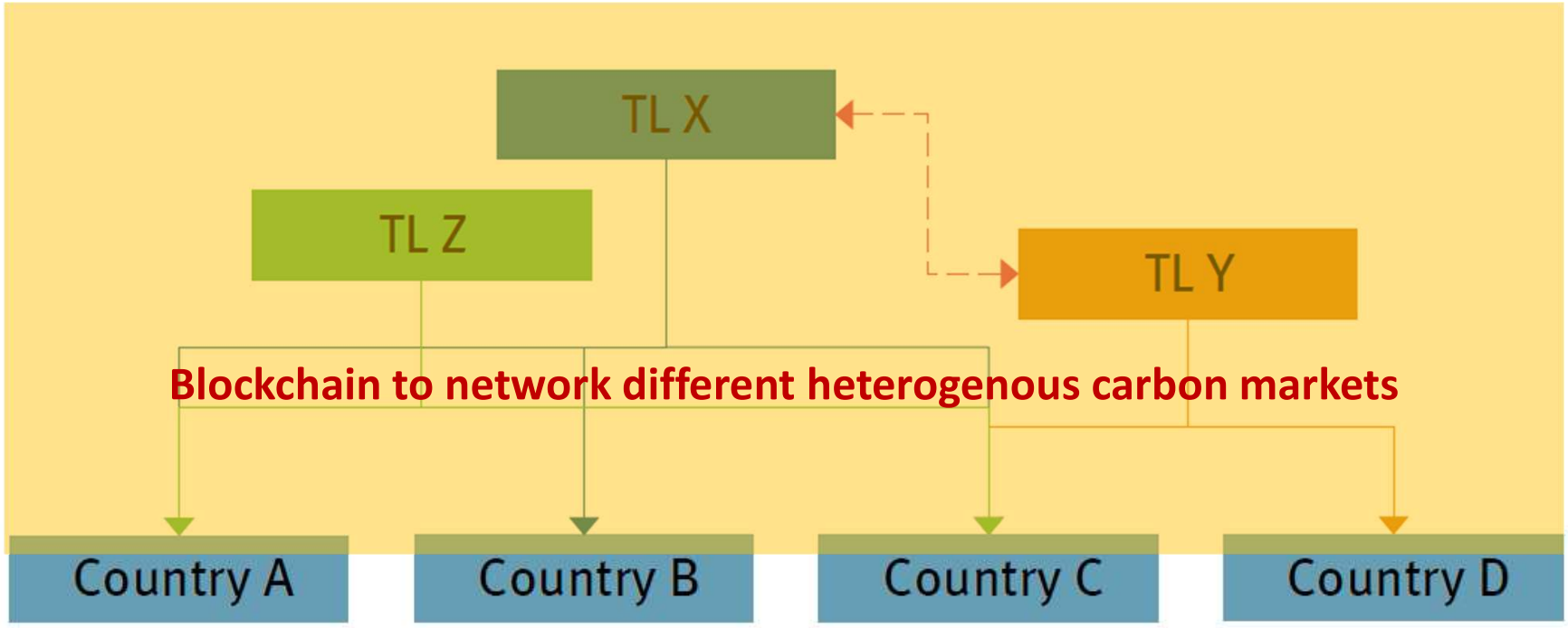
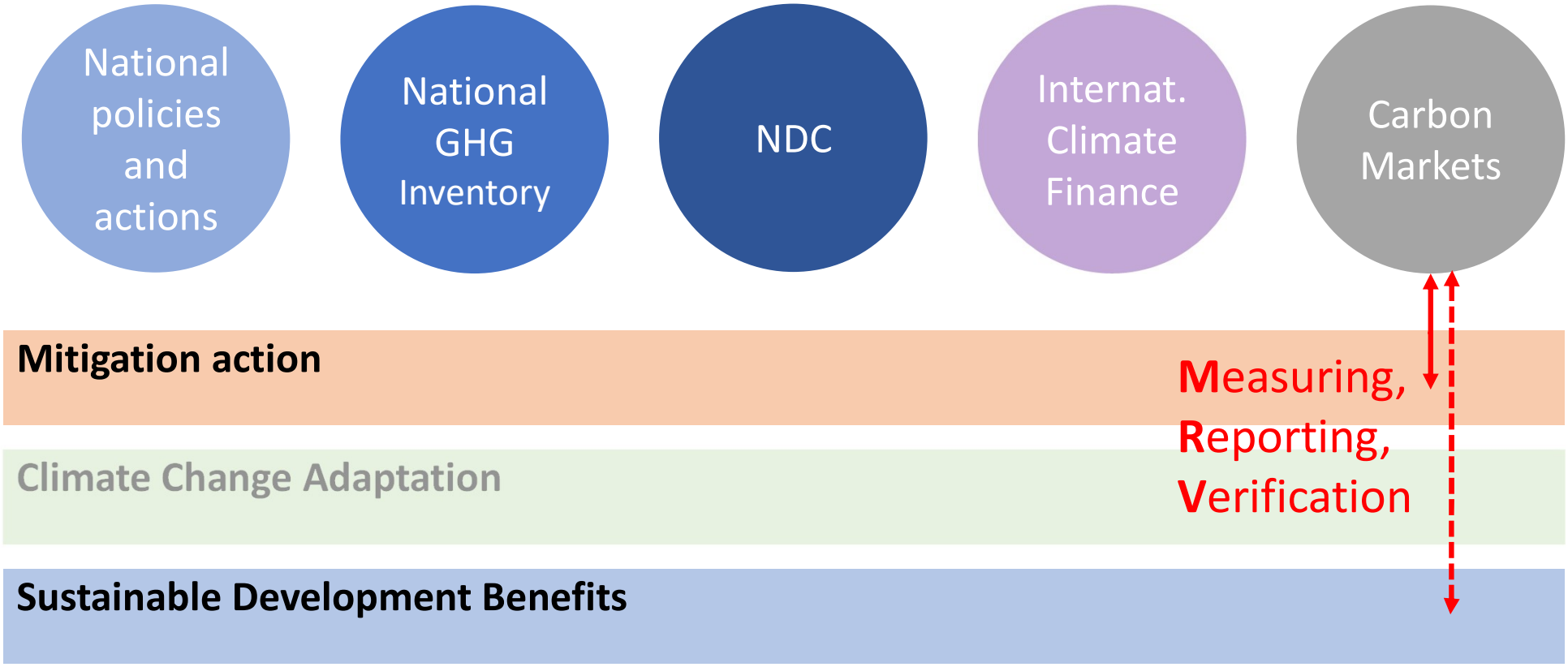
Multitude of Transaction Logs (Databases) need to interconnect -> application for blockchain based registry ecosystems



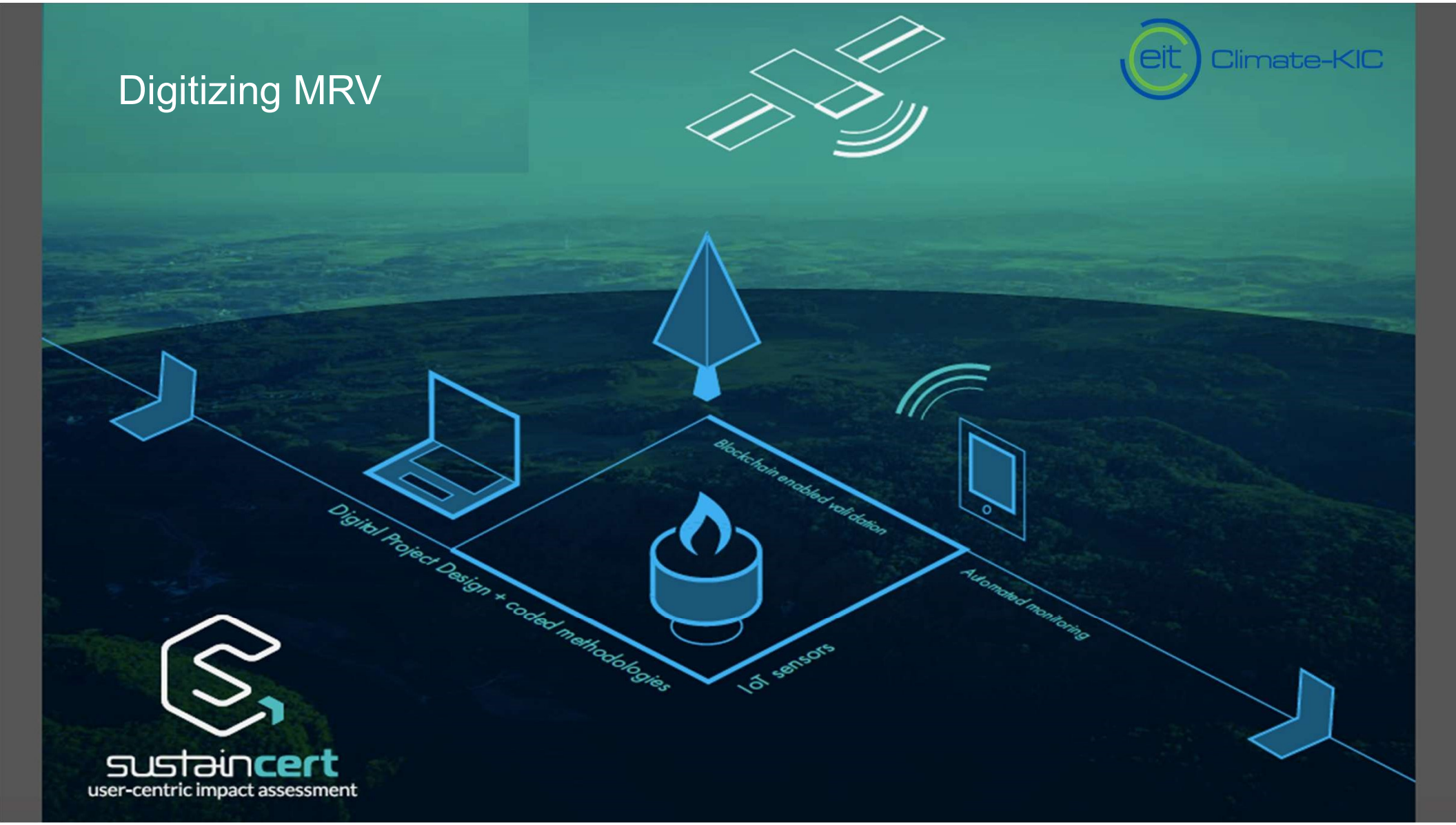
Source: Schneider, Fuessler et al. (2017) *Robust Accounting of International Transfers under Article 6 of the Paris Agreement.* UBA

Example 2: Digitizing MRV and linking to blockchain



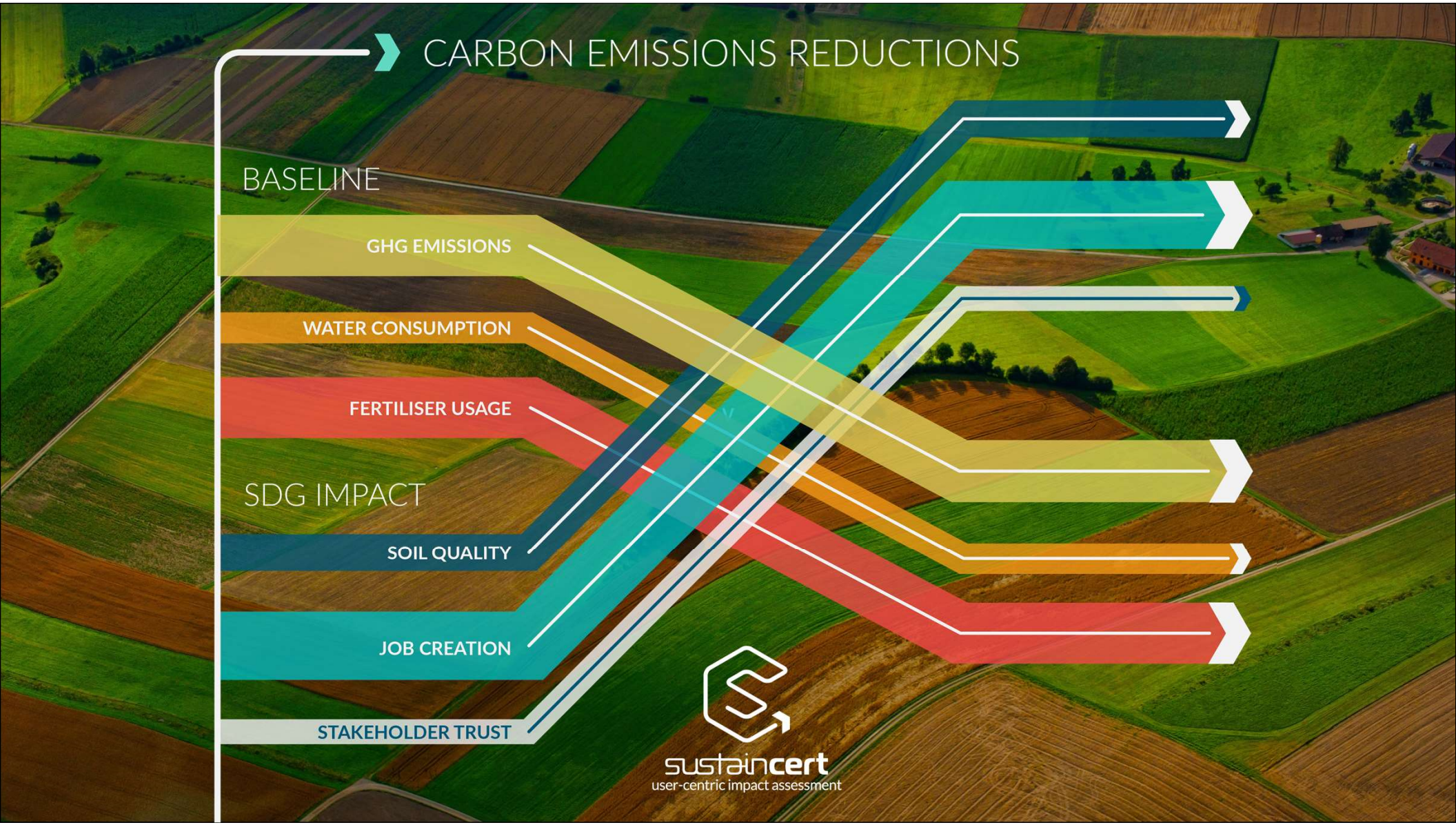
Source: Climate Ledger Initiative

Digitizing MRV



sustaincert
user-centric impact assessment

eit Climate-KIC


CARBON EMISSIONS REDUCTIONS
BASELINE
GHG EMISSIONS
WATER CONSUMPTION
FERTILISER USAGE
SDG IMPACT
SOIL QUALITY
JOB CREATION
STAKEHOLDER TRUST
sustaincert
user-centric impact assessment

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Thank you.

Jürg Füssler
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www.climateledger.org

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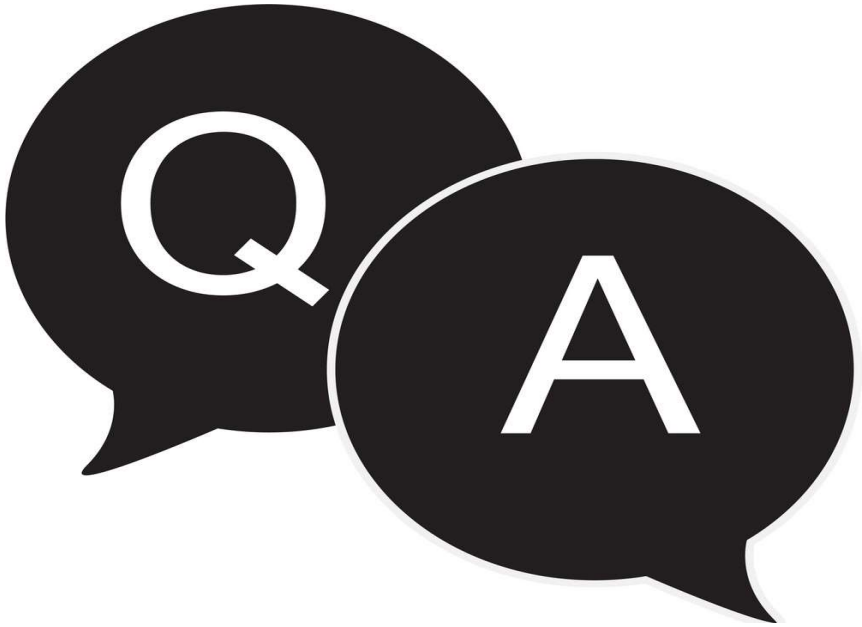
Questions and Answers



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GIZ regional cooperation (GADERALC) on blockchain and climate

Ximena Aristizabal

"Prepraration of an Emission Trading System in Mexico" – GIZ Mexico

Kathrin Ludwig

"Mexican German Climate Alliance" – GIZ Mexico

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Regional cooperation (GADERALC) on blockchain and climate in Latin America

October 4th, 2018


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- Carbon markets
- MRV climate finance
- MRV emissions

Forests & Fisheries

Carbon footprinting in the coffee sector

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On behalf of:
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Objectives

- Analyze the potentials o blockchain solutions for climate policy instruments and sustainable value chains
- Interchange with experts, counterparts and colleagues in the region

Our approach

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Products

- **Introductory briefing paper** on blockchain and climate policy instruments
- **3 case studies** in Costa Rica, Brazil and Mexico focusing on climate policy and values chains
- **Final briefing paper** to summarize lessons leanred as well as enabling conditions for blockchain solutions
- **2 webinars** to disseminate results and interchange experiences

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Sven Braden

consultant and CLI member

David Cortés

consultant - ORUKA

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On behalf of:
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Dörte Segebart

Project Director – GIZ Brazil

Christian Hübner

Project Director – Konrad-Adenauer-Stiftung e.V. (KAS)

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Mexico: Blockchain for carbon markets and transparency systems

Sven Braden,

Independent consultant and representative of
Climate Ledger Initiative

“Blockchain-based solutions for climate policy in Latin America”

MEXICO: Blockchain for carbon markets and transparency systems

Sven Braden/Climate Ledger Initiative

On behalf of:

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Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

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Date: 04.10.2018

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Activities

Exploring the application of blockchain technology for Emissions Trading and climate-related Monitoring, Reporting and Verification systems in Mexico

Objectives

Potentials, preconditions, risks and barriers for a blockchain-based

- ETS registry (and a potential carbon / GHG coin)
- MRV System for Greenhouse Gas Emissions and
- MRV System for Climate Finance

Scope

Analysis tasks are divided into

1) Explorative and capacity building phase (Work Package 1: Exploration of potentials of blockchain for climate governance), and

2) Recommendation phase with definition of preconditions for applying blockchain-based climate policy, where appropriate (Work Package 2).

What are the challenges of current **Emissions Trading Systems** **and the potential of Blockchain Technology?**

- **Limited scope**: current architectures come with high trnsaction costs which exclude small emitters and sectors – Lower transaction costs of the ovarall blockchain architecture and the p2p set-up could expand the ETS scope

- **Establishment of emission caps**: Maintaining ambitous emisssion caps which drive innovation may proof difficult especially in context of domestic policy making - applying smart contracts together with verified „close-to-real time“ data can assist policy planning in the future

- **Distribution of Allowances**: via auctioning is often not transparent – offers and bids displayed on a public (but permissioned) ledger could provide transparency and confidentiality (p2p)

- **Offset Policies**: risk that emission reductions reflected in a carbon unit have been used elsewhere (double counting) – carbon units stored on a universal (shared) ledger are „accessible“ for authorities (who can check the status of the units status at any time)

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What are the challenges of current **Emissions Trading Systems** and the potential of Blockchain Technology**?**

- **Trading Mechanism / Registry**: ETS are vulnerable to traditional white collare crimes such as securities fraud, insider trading, money laundering, transfer mispricing and internet crimes – bc based features like shared and distributed ledgers (of transactions) as well as the necissity to cryptographically sign transactions in the network increase the accountability and the security of the ETS

- **Intangible Nature of carbon (and other GHG):** Separation between ownership of the investment project and the rights to trade the associated emissions allowances (or offset units) make tracing the origin of carbon assets more difficult – Carbon units (incl. both allowances, offsets or GHG units) can be linked to unique identifiers via an associated tokenization.

What are the challenges of current **Emission MRV processes** and the potential role for blockchain?

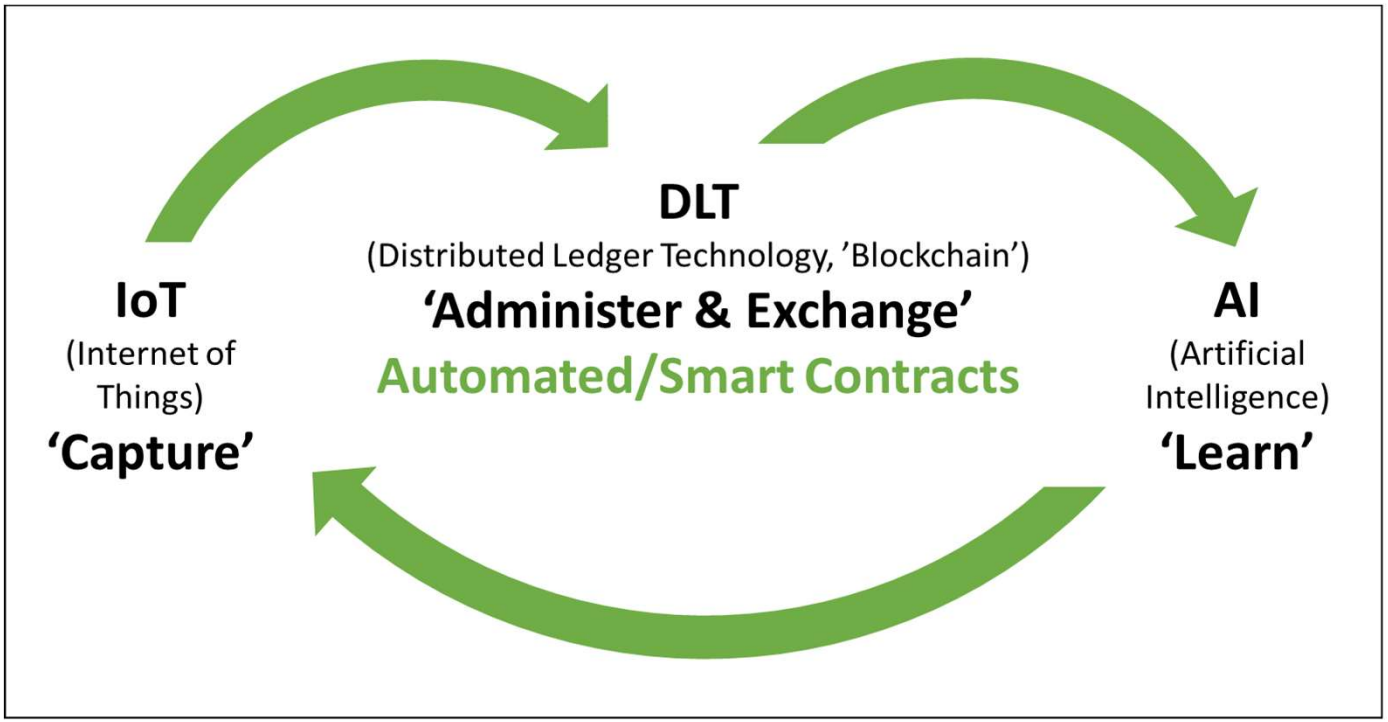
- **Costly and impractical**: Depending on the means of collecting (who?/how?) and verifiying (who?/ how?) data. Combining Blockchain Technology and Smart Contracts with IoT can automate processes and lower transaction costs. Decentralisation could be key for increased interoperability and hence a facilitate access to review data

- **Time consuming**: MRV Processes take time, depending of the MRV framework between several months and 2 years. Blockchain Technology enables data flows from previous data silos, e.g.. via tokenization of GHG emissions (or its sources) which leads to lower time consumptions

- **Data accuracy, bias and transparency issues**: Access to (primary) Data can be cumbersome: Non-existent historic data (relevant to calculate baseline emissions); Data Gaps. By incentivising entities, communities or households to generate verified data, accuracy can be increased

- **Risk of data manipulation**: intentional misreporting, selective choice of collecting data; measuring only specific data variables The necessity to cryptographically sign transactions in the network (e.g. writing on the blockchain) increases the accountability of data points

What are the challenges of current **Emission MRV processes** **and the potential role for blockchain?**



Source: Cleantech21

Thank you!

Sven Braden / Climate Ledger Initiative

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Costa Rica:
Blockchain in the coffee sector

David Cortés,
consultant - ORUKA

Costa Rica:
Blockchain in the coffee sector

oruka.lat

/OrukaLatam

/OrukaLat

contacto@oruka.lat

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Objectives

- Analyze potentials, preconditions, risks and barriers to entry for applying blockchain-based solutions to climate policy issues in Costa Rica.
- Explore of potentials of blockchain for climate governance in Costa Rica.
- Summarize state-of-the-art theoretical and practical knowledge; prepare a case study on the potentials of blockchain-based instruments focused on the traceability of the climate impact of coffee production.
- To identify lessons learned and common challenges, needs, risks and/or other relevant elements that might have a great influence on the feasibility for implementing blockchain based solutions for climate issues in Brazil, Costa Rica, Peru and Mexico.

Activities

- Identify institutional, financial, technological, political and regulatory needs and **preconditions to do a pilot project** to implement a blockchain solution and evaluate where it would have most added value.

- Develop a **cost-benefit analysis and showcase a preliminary estimation of time and resources** needed for the implementation, considering internal capabilities, institutional, financial, technological, regulatory needs, risks involved, etc.

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Background

- In Costa Rica, coffee production plays a key role in the economy while also accounting for nine percent of greenhouse gas (GHG) emissions.
- Costa Rica's coffee plantations cover more than 90,000 hectares, situated between 600 and 1,600 metres above sea level.
- Moreover, the sector comprises 45,000 producers, 239 mills, 72 exporters and 80 roasters, representing eight percent of the Costa Rican workforce.
- NAMA Café de Costa Rica is the first agricultural NAMA in the world.

Background

Blockchain offers immutability, traceability and a common framework for trust between parties.

Blockchain solutions are being implemented to address the technological, logistical and adoption-of-standards challenges in supply chain management.

Monitor, Reporting and Verification (MVR) systems:

- IBM, Walmart, Kroger, Nestle, etc., are deploying a supply chain solution for China and for agricultural products in Latin America.
- TradeLens: IBM, Maersk (and others) are developing a global supply chain solution
- Starbucks: ethically sourced coffee traceability on the blockchain

Background

Blockchains offer the possibility of creating highly secure cryptographic tokens, which can then be traded P2P, in online exchanges or in traditional financial markets.

Emissions Trading System (ETS):

- There are several projects building blockchain platforms to facilitate the carbon credit accounting and offsetting process across supply chains.

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First Insights

Blockchain technology could be used to trace the carbon emissions along the coffee supply chain to provide full transparency to each carbon credit (equivalent to a CO2 ton).

The carbon credit itself could be a blockchain-based crypto-asset, which carries the history of the emissions saved by the traceable coffee lots associated to the instrument.

The challenge in the medium term is to evaluate the feasibility of linking the coffee NAMA supply chain (MRV) to an ETS with cryptographic tokens backed by the traceable emissions savings.

Relevant actors

- Costa Rican Coffee Institute (ICAFE)
- Climate Change Direction (MAE)
- Agriculture and Livestock Ministry (MAG)
- Interamerican Institute for Agricultural Cooperation (IICA)
- International Center for Tropical Agriculture (CIAT)
- Costa Rican Blockchain ecosystem
- Producers, mills, among others

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Icafe
Instituto del Café de Costa Rica

NAMA
Nationally Appropriate Mitigation Actions
CAFÉ DE COSTA RICA

Thank you

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Brazil:
Blockchain in the cattle and fishery sector

Doerte Segebart,
Project director “Integrated management of marine and coastal biodiversity” – GIZ Brazil

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Blockchain and climate finance

Christian Hübner,

Head of Regional Programme Energy Security and Climate Change Latin America - Konrad-Adenauer-Stiftung e.V.

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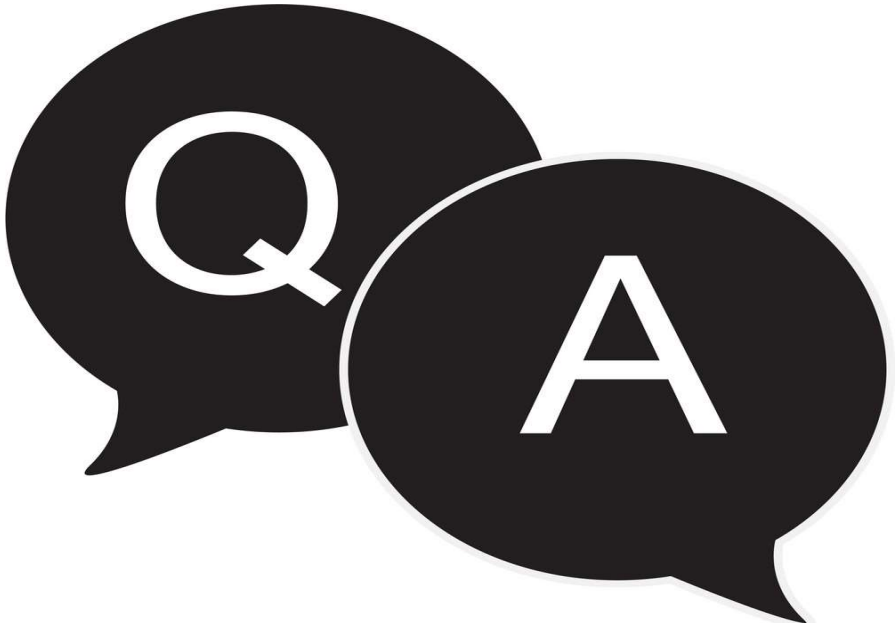
Questions and Answers



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Thank you!