



Joint Activities CTCN - TEC

22 SEPTEMBER 2023

CTCN ADVISORY BOARD MEETING



Green Technology Database

Mandate



The Technology Mechanism included in its joint work programme for 2023-2027 a joint activity on digitalization

The TEC and CTCN Advisory Board (CTCN AB) at its joint session on 24 March 2023 decided to establish a joint taskforce to provide further guidance on this work inter-sessionally

The TEC and the CTCN AB requested the joint taskforce to produce a draft concept note on green technology databases to inform possible best ways for green technology databases to be delivered to countries

Green Technology Database Background



- **WIPO GREEN database** is a free, solutions oriented, global innovation catalogue that connects needs for solving environmental or climate change problems with tangible solutions
- The database was created around 2013, and a **large number of technologies were exported to the CTCN knowledge management system** in around 2015.
- In 2021, the **WIPO GREEN database was completely rebuilt** and enhanced with new content, content types and advanced matchmaking functions.
- The **database is an UN-based, free, public resource**, fully financed by WIPO. The database is openly searchable by the public. Registration is required for uploading and for contacting technology providers. There are no fees.



Objectives and Focus Areas

There is a **gap in knowledge between tangible climate change needs and technology-based solutions** (incl. their feasibility, barriers, etc.).

The objective of the WIPO GREEN database is to **provide information on climate technology solutions in an easily accessible and inclusive way**. The database is open to all serious and realistic innovation and thereby designed to provide a broad picture of innovation, diversity, and inclusiveness.

The database has 7 focus areas with underlying technology categories.

Focus Areas



Features and Quality Assurance



Database includes the following **types of data** (# of entries):

- User-uploaded needs (378) and technology descriptions (3267)
- Green technology patent applications (imported from WIPO Patentscope database; 124,226)
- User-uploaded expert profiles (293)
- Knowledge materials (44)
- Financiers and financial partners (planned for 2024)

Some of the **features** are:

- Simple and advanced searches (AI-based) for technologies, needs and patents.
- AI-based matching after uploading a need or technology
- Data quality assurance: Users need to register and obtain permission to upload (initial screening) and WIPO verifies quality of uploads
- user uploads tracing and alerts
- full-text search for solutions based on long need descriptions
- Profile of relevant experts – some pro bono services

The screenshot displays the WIPO GREEN database search results. The interface includes a search bar at the top with the text "Search WIPO GREEN Database" and a search button. Below the search bar, there are filters for "Green Technology Book (656)", "Source", and "Type". The search results are displayed in a grid format, showing three entries:

- Extract Phenolic Compounds from Rice Husk with the SFT-120 Supercritical Fluid Extraction System**: A primary food source in much of the world, leftover processed rice husks contain a significant amount of phenolic compounds with antioxidant properties that can be used to reduce the risk of many diseases due to their protective effect. The SFT-120 SFE System is a tool being used to determine the optimal process for this application and to eliminate the need for toxic solvents that are unsuitable for use in food applications. ID: 148732
- Interlocking bricks**: Hydraform is a South African manufacturer of brick and block-making machines for construction, using stabilised soil cement blocks or compressed earth blocks. The blocks can be constructed on-site, using locally available materials, without the need for mortar. The machines enable bricks and blocks to be hydraulically compressed to form interlocking blocks, which reduces the need for plaster and cement mortar joints, saving costs and emissions. ID: 148731
- Electrocaloric heat pump**: Heat pumps often use compressor technology that rely on refrigerants, which contribute to global warming. Solid-state heat pumps, on the other hand, include electrocaloric systems that can operate using fluids such as water instead of refrigerants, and which are significantly more energy-efficient. When an electric field is applied to electrocaloric materials, the material heats up and the heat is dissipated via a heat sink cooling down the material again. When the electric field is removed, the ... ID: 148730

Each entry includes a title, a brief description, a progress indicator (a horizontal line with a green dot), and metadata such as "Owner", "Uploaded by", "Type", "Source", "Published", and "Developed in".

Potential CTCN Integration



WIPO Green database is open to the general public and green technology and can be used actively as a repository and matchmaking tool for technologies, needs, experts and knowledge material. **Special gateways into the database can be created for partners.**

Integration with the work of CTCN could be done in several ways (subject to further technical discussions and resources availability):

Solutions repository

The database can be used as the main climate solutions repository of CTCN for countries and partners. It could be linked to the technology taxonomy.

Needs matchmaking

NDEs can upload specific needs to the database. These needs will be auto matched in the database but can also be assisted with tailored staff-based matchmaking

Expert roster

The database can host a roster for climate change related experts, including the planned roster of gender experts.



Distributed Ledger Technology

Mandate

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The TEC and the CTCN AB requested the joint taskforce to produce a draft concept note on distributed ledger to inform possible best ways for distributed ledger to be delivered to countries in terms of usability and effectiveness

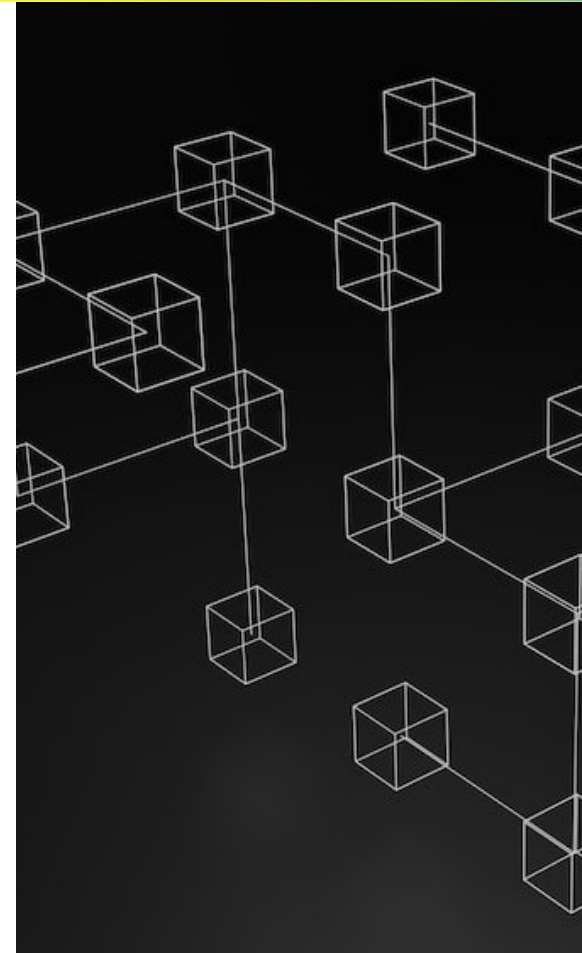
Distributed Ledger Technology- **Background**

Blockchain / DLT has the **potential to act as an accelerator of global climate actions**. First successful applications in the areas of clean energy, climate finance, carbon markets and value chains have been tested and implemented.

DLT is a system in which a record of transactions in tokens is maintained across several computers that are linked in a P2P network. Thereby, **trust, security, transparency and traceability of data** shared across a network can be increased, and cost savings with new efficiencies can be achieved.

In 2021, **CTCN delivered a learning course and webinars** on “Emerging Digital Technologies for Climate Policy Implementation” with a focus on Blockchain technology, attended by more than 380 participants in total from 74 member states.

The activities **generated more interest** for the potential of blockchain for climate action, but also raised questions as to **how blockchain can be leveraged best in developing countries**.



Key Features and Attributes

Key features of blockchain technology include:

- immutable audit trail of transactions
- borderless and cheap transfer of digital assets
- automated execution of contracts (smart contracts)

Key attributes are shown on the right side.

Uniqueness: Transactions are run through a hashing algorithm generating a unique identifier for every transaction file.

Validity: All transactions on the blockchain network must be verified by a validator for their legality to prevent malicious or double-spending.

Consensus: Transactions are recorded and approved through a 'consensus algorithm' process.

Immutability: Transactions and accounts are spread across the network through a database consensually distributed and synchronized at multiple sites.

Authentication: Users can exchange digital agreements alongside financial and/or non-financial value with smart contracts.

Potential Applications

Clean energy:

- Decentralized renewable energy systems through P2P energy trading
- Higher transparency, trust, traceability and reliability of energy savings insurance

Climate Finance:

- More accessible and transparent mitigation infrastructure investments through tokenization

Carbon Markets:

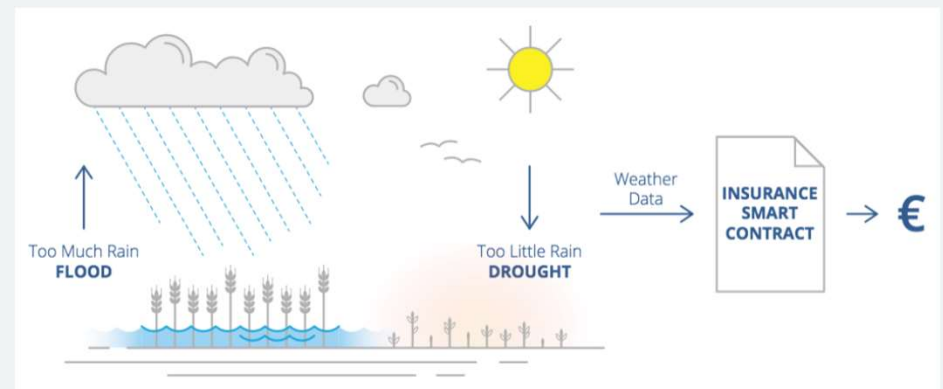
- Enabling mechanism for trading and accounting of mitigation outcomes

Value Chains

- Supply chain transparency across multiple participants through data immutability

Blockchain-based real-time parametric crop insurance

Blockchain technology has the potential to create a more effective parametric insurance model for farmers. With smart contracts and IoT sensors, parametric insurance could become increasingly autonomous, transparent, and efficient by automating claims handling based on a predetermined set of weather condition parameters.



Bottlenecks

Most use-cases and applications are still in their initial stages of development and many more will be identified in the coming years. This area is still full of uncertainty, technological challenges and information gaps that mean even greater barriers for technology adoption in developing countries.

Costs & efficiency

High aggregate (operational) and development costs.

Energy consumption

High energy consumption. New, low energy consumption protocols under development.

Regulation & governance

Decentralized vs. centralized networks posing governance and cultural challenges. Possibility of sandboxes.

Required infrastructure

Reliable infrastructure required including energy supply and internet network.

Awareness & understanding

Lack of digital literacy and capacity. Requires human-centered design.

Technological complexity

Not implemented as a stand-alone technology but combined with other technologies.

Way Forward



Technical Assistance

Focus on earlier stages of technology development and the enabling environment:

- Development of a national roadmap or regulatory framework for the adoption of blockchain technologies in support of the NDCs;
- Identification of blockchain use cases in a certain sector / for a certain activity;
- Pre-Feasibility study for blockchain applications in a certain sector;
- Piloting of blockchain applications in a certain sector / for a certain activity;

CTCN shall identify network members with blockchain competencies or attract new members.

Capacity Building

- The blockchain course that was delivered in 2021 can be made available to NDEs for continuous learning, or another improved course can be delivered
- Existing and new collaborations with network members in this field can be leveraged to provide continuous capacity building.

Knowledge Management

- Potential and barriers for blockchain in developing countries;
- Clear information basis on blockchain technology (demystification: not equal to bitcoin and also not one-solution-fits-all).

TEC and CTCN can coordinate with other UN entities and beyond for collaborative development of knowledge management products in this area.



CTCN Secretariat
UN City, Marmorvej 51
DK-2100 Copenhagen, Denmark
www.ctc-n.org
ctcn@un.org



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