

CLIMATE | **LEDGER**  
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# NAVIGATING BLOCKCHAIN AND CLIMATE ACTION

Key findings

4 December 2018

**The ‘Navigating Blockchain and Climate Action’ report was prepared by an international team of authors with a diverse set of experiences and insights. It is a knowledge product of the Climate Ledger Initiative (CLI) published on an annual basis to track progress according to latest research and use cases – supporting CLI’s role as an international knowledge platform to accelerate climate action through blockchain based innovations.**

## The Climate Ledger Initiative

The mission of the Climate Ledger Initiative is to accelerate climate action in line with the Paris Climate Agreement and the Sustainable Development Goals (SDGs) through blockchain-based innovation applicable to climate change mitigation, adaptation, and finance.

The Climate Ledger Initiative has been founded by Cleantech21 and is jointly operated by Cleantech21, LIFE Climate Foundation, INFRAS Consulting, Analysis & Research and the Gold Standard Foundation.

The Climate Ledger Initiative is financially supported by the Government of Switzerland and the Government of Liechtenstein as well as by EIT Climate KIC. It maintains a platform of donors, partners and collaborators that it is constantly expanding.

For more information, in case of interest in partnerships and collaboration and for registering to our newsletter please visit <https://climateledger.org/>.

For the full report, visit:  
<https://climateledger.org/en/Focus/Navigating-report.38.html>

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## Key findings for policy makers

Climate change is one of the most pressing existential threats to humanity. The dramatic transition to net zero emissions by mid-century will require global action on an unprecedented scale. This tremendous global challenge coincides with the emergence of the blockchain technology, or more generally Distributed Ledger Technology (DLT)<sup>1</sup>, a new and innovative form of decentralised database providing new ways for secure exchange and storage of data and digital assets, primarily designed for peer-to-peer transaction platforms.

Blockchain technology provides a key to solving some of the critical issues that hinder effective scaling of climate action. The main benefits of blockchain technology are rooted in three main characteristics:

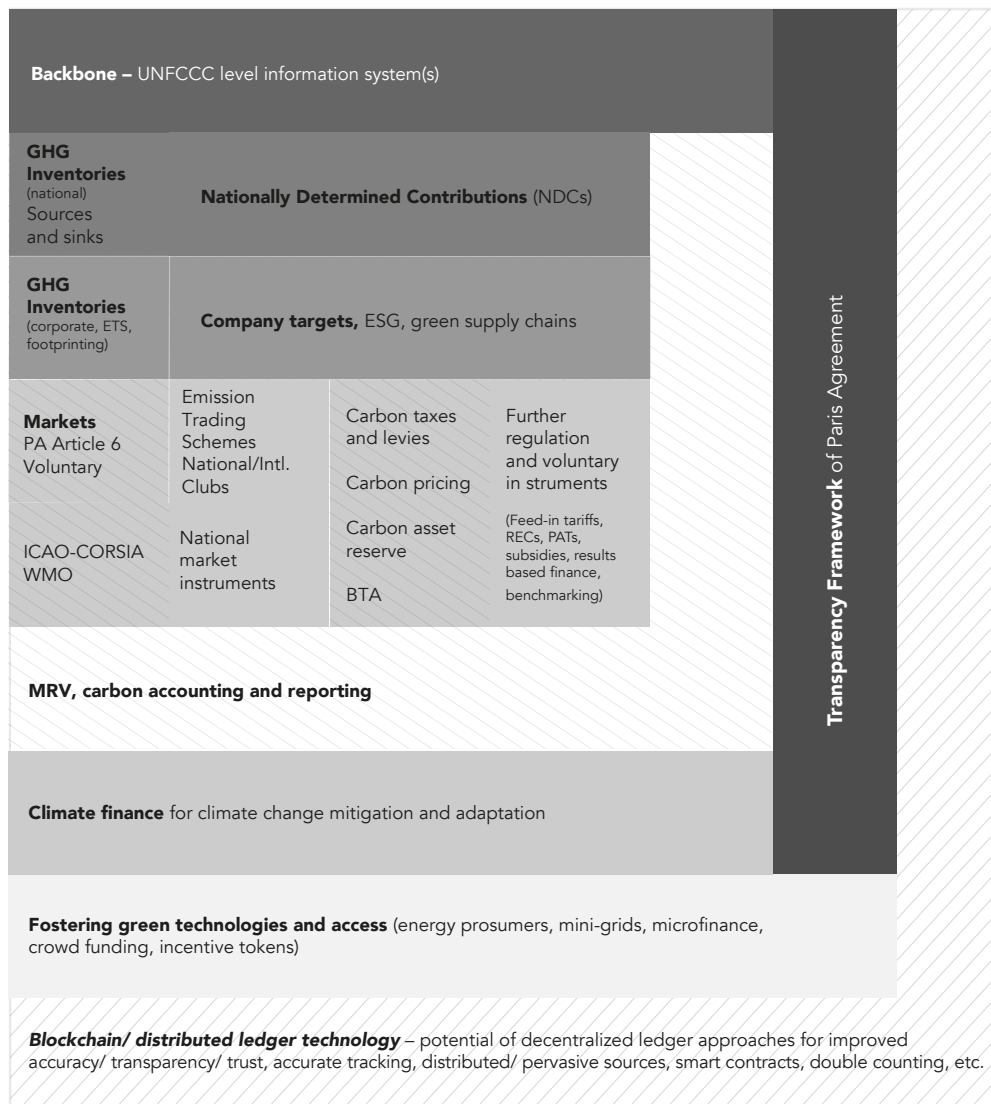
- Data records on a blockchain are immutable through a permanent ledger for increased transparency.
- Blockchain technology brings trust to peer-to-peer transactions – particularly important in the context of weak regulatory settings or under decentralised governance.
- Smart contracts – applications that can automatically execute the terms specified in a contract on a blockchain – increase efficiency and reduce transaction costs.

The potential of the technology seems boundless; however, many common climate-related applications are voluntary reward systems building on the tokenisation of climate or sustainability benefits. These rather ad-hoc, initial coin offerings (ICO) funded applications appear limited in impact and lifespan. More importantly, niche markets in voluntary climate action represent only a fraction of the lynchpin issues for effective Paris Agreement implementation.

<sup>1</sup> In this report, we are using the more common term «blockchain» as a simplifying placeholder for the much broader concept that includes all distributed ledger technologies, even though blockchain is only one implementation of DLT.

**The key question therefore is: Where and how can blockchain technology best accelerate climate action?** This report – written for governments, climate practitioners and the blockchain community – builds on an analysis of the key requirements to implement the Paris Agreement (FIGURE 1) to provide a systematic assessment of the potential of the technology to accelerate climate action. It explains how blockchain technology is currently applied in specific use cases and where further work, analysis and insights are needed to fully unleash the potential of the technology.

**FIGURE 1 — Key thematic issues of the Paris Agreement to scale up climate action**



Source: Climate Ledger Initiative. Abbreviations: GHG: Greenhouse gases, ETS: Emissions Trading Schemes, ESG: Environmental, Social and Governance Criteria in the Finance industry, PA: Paris Agreement, ICAO-CORSIA: The International Civil Aviation Organization’s Carbon Offsetting and Reduction Scheme for International Aviation, WMO: World Maritime Organization, BTA: Border Tax Adjustments, REC: Renewable Energy Certificate, PAT: Perform Achieve Trade Scheme for Energy Efficiency in India’s Industry, MRV: Measuring, Reporting and Verification.

Building on a comprehensive analysis of the needs of the Paris Agreement, the authors identify **three main areas where blockchain has the most potential to accelerate climate action:**

- 1 — **Next-generation registries and tracking systems:** The decentralised nature of the Paris Agreement and its governance structure requires new approaches to registries and tracking systems to handle heterogeneous rulesets for accounting and reporting and to allow for trusted, networked carbon markets (Chapters 2, 3, 4).
- 2 — **Digitising Measuring, Reporting and Verification (MRV):** Blockchain is part of an ecosystem of digital technologies including remote sensors, internet of things, big data and artificial intelligence (Chapter 5). The combined use of these new technologies can unlock new, more accurate ways to measure, report and verify climate outcomes at lower transaction costs. Digitisation of MRV also allows the coding of methodologies and processes in the form of smart contracts for the automated issuance, transfer and payment of climate outcomes. Digital MRV can facilitate access to carbon markets or other results-based finance schemes for the private sector players, in particular in weaker regulatory frameworks – including for climate finance and adaptation (Chapters 6, 7). It can also transform corporate supply chains towards more transparency and accuracy on climate and sustainability impacts of goods produced and sourced (Chapter 12).
- 3 — **Decentralised access to clean energy and finance:** Blockchain systems emerge as the backbone of new decentralised markets for clean energy where individual “prosumers” are empowered to produce and store their own renewable energy and trade with their neighbours (Chapter 11). More generally, blockchain technology combined with new fingerprint, iris or face recognition technology allow individuals who lack identity documents or bank account to access climate finance in the form of micro credits, subsidy schemes of payments for mitigation or adaptation action (Chapter 6).

Blockchain technology is by no means the silver bullet that can put the world on track to meet a 1.5° or 2° target. There is little technology can do to solve issues such as lack of political ambition or regulatory and institutional challenges of the Paris Agreement. Work on the priority areas of innovation identified in this report remains largely early stage as governments, the UNFCCC secretariat, multilateral organisations, NGOs, private businesses and start-ups are gaining experience through use case implementation. Much research and development stands before us, including real-world testing in a wide range of use cases. Challenges like high power consumption, limited storage space, time lag and network security remain to be solved. Governance for transaction on blockchain based systems must be smartly designed and embedded in national and international regulatory systems.

As an emerging disruptive technology, blockchain’s full potential cannot be forecast with certainty. This is why, in close collaboration with its network of partners, CLI will continue its work to provide an international knowledge platform on these issues and accelerate adoption of new technologies for climate action.

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This activity has received funding from the European Institute of Innovation and Technology (EIT), a body of the European Union, under Horizon 2020, the EU Framework Programme for Research and Innovation

Swiss Agency for Development and Cooperation (SDC), the Government of Liechtenstein, EITClimate-KIC.

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