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Operating Unit on Policy-Driven
Electronic Governance

Exploring Blockchain for Healthy, Smart, and Zero Carbon Cities and Communities

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(Global Forum on Human Settlements, December 16, 2022)



Potentials of Emerging Technologies

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Innovative solutions and technologies will play an important role in ensuring future cities are **more people-centred, inclusive, safe, resilient and environmentally friendly**. As centres of economic development, and cultural and social exchange, cities have always catalysed innovation.

-UN World Urban Forum 11th Session, June 2022

USD 3.4 trillion

Global investment in **digital transformation** by 2026

-Statista Digital Transformation 2021 Report

Blockchain and Smart Cities

Blockchain technology is increasingly seen as a tool for boosting **data transparency** and **traceability** in smart cities. As a decentralized IT infrastructure, blockchain technology can serve as a suitable means to **manage the growing networks** emanating from smart sustainable cities.

Blockchain x smart cities use cases:



Healthcare services

- **Integrated patient database** (Estonia's e-Health)
- **Tracking public health crises** (US CDC's outbreak monitoring system)
- **Medical supply chain** (Switzerland's temperature-based medical supplies tracker)



Smarter public services

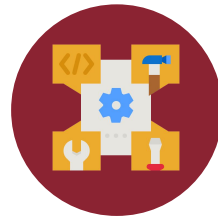
- **Digital IDs** (Estonia's national ID and e-Residency)
- **Social benefits payment** (UK's social welfare app)
- **E-voting** (Gyeonggi-do, South Korea's local meeting votings)

Can blockchain help cities go greener?

- Some blockchain applications like Bitcoin are known as environmental polluters with their massive energy consumption and green gas emissions. But blockchain can also be more **energy-efficient** depending on the choice of network architecture and protocols (OECD, 2019).
- Blockchain can **support the distributed energy network** through (UNEP, 2022):



**Facilitating reduction
in transaction costs**



**Simplifying
transactional processes**



**Providing social value
through its traceability
& transparency**



Sources: OECD. (2019). <https://www.oecd.org/finance/Blockchain-technologies-as-a-digital-enabler-for-sustainable-infrastructure-key-findings.pdf>
UNEP. (2022). <http://www.socialalphafoundation.org/wp-content/uploads/2022/01/saf-blockchain-report-final-2022.pdf>

Blockchain for sustainable energy & climate



Peer-to-peer energy trading

Network of local renewable energy markets
(e.g., *Power Ledger in Thailand, India, & Malaysia*)



Market platform for renewable energy certificates

Decentralised marketplace for renewable energy certificates
(e.g., *EW Origin in Turkey, Thailand, & El Salvador*)



Micro-leasing marketplace

Financing platform for individuals and corporate energy investors
(e.g., *Sun Exchange in South Africa*)



Trading of carbon offset credits

More trustworthy & transparent carbon credit data
(e.g., *ECO2 Ledger in China*)



Digital MRV

Automating measurement, reporting, and verification (MRV) processes
(e.g., *IOTA's solution in Chile*)

Source: UNEP. (2022). <http://www.socialalphafoundation.org/wp-content/uploads/2022/01/saf-blockchain-report-final-2022.pdf>

Recommendations & Conclusion

- **65 initiatives** addressing environmental issue
- Potential of blockchain in environmental sustainability:
 - **Resource rights**
 - **Products origin**
 - **Incentive system**
- Development of **alternative protocol** to create to reduce the energy intensity



Support and promote a responsible and cautious use of Blockchain and related digital technologies:

- It is important to acknowledge the potential and opportunities of Blockchain technologies and the exploitation of data to address environmental, social and economic challenges.
- It is as important to address the negative and challenges related to Blockchain technologies and related digital technologies.



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“With the right policies, digital technology can give ‘*an unprecedented boost to sustainable development*’, particularly for the poorest countries.”

-UN Secretary-General António Guterres, G20 Summit 2022 in Bali, Indonesia

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