

Enhancing MRV with Digital Innovations

Tom Baumann | January 23, 2018



Examples of Existing Digital for MRV

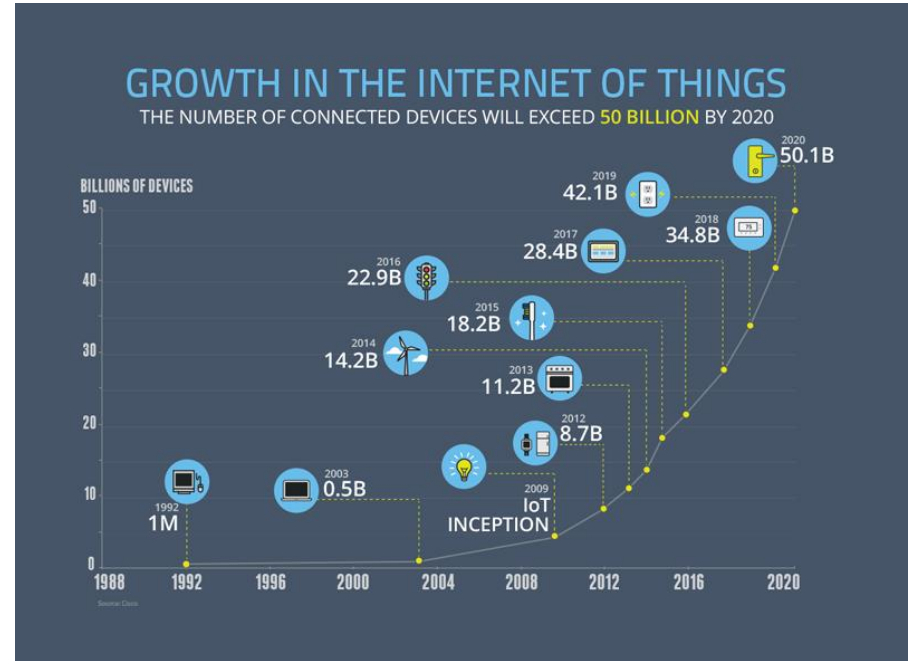
- Calculators (often MS Excel)
- GHG inventory software and data management systems
- LCA databases
- Emission factor databases
- Knowledge hubs
- Remote sensing
- Mobile sensors
- CEMS (Continuous Emissions Monitoring Systems)
- Online reporting and registries

Many Digital Innovations

- Distributed Ledger Technology (Blockchain)
- Billions of connected devices as the Internet of Things (IOT)
- Big Data Analytics
- Social networks (Web 2.0)
- Artificial intelligence (AI) and machine learning
- 3D printing, Industry 4.0, Robotics, Drones
- Mobile economy
- Sharing economy

Digital Growth

- Approx 50 billion IoT devices
- Data created in 2017 more than previous 5000 years
- Mobile economy to connect $\frac{3}{4}$ global population by 2020
- Digital currency market over \$400B today
- Sharing economy over \$350B by 2025
- Social networks over 3B users

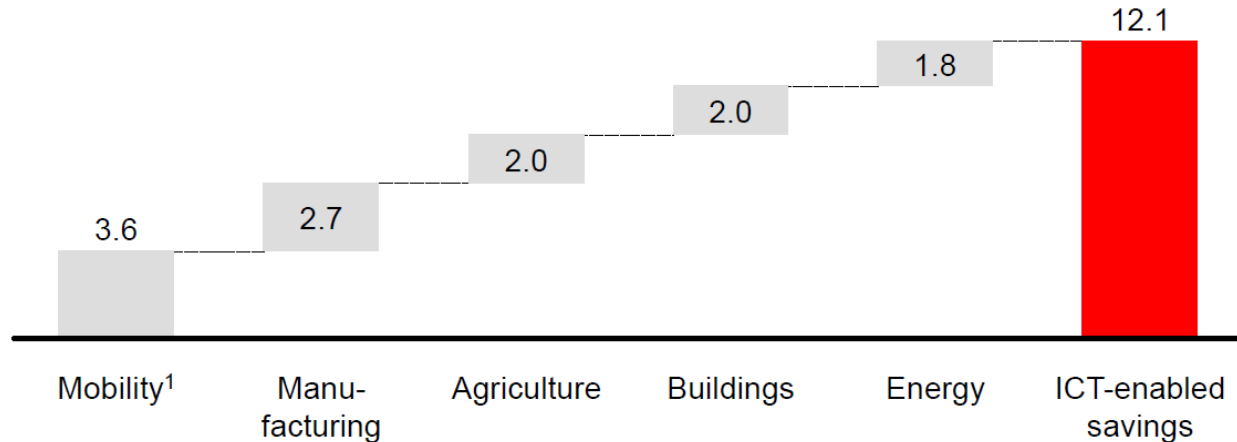


Source: Cisco

Smarter 2030 – Digital for Climate Actions

- Decouple economic growth from GHG emissions with resource efficiency (reduce GHG intensity per unit of economic activity by 20% by 2030)

Figure 1: CO_{2e} abatement potential by sector (2030)



¹ Mobility solutions consider ICT-enabled improvements to private and commercial mobility and additionally consider the reduced need to travel from various sectors, including health, learning, commerce, etc.

Source: WRI, IPCC, World Bank, GeSI, Accenture analysis & CO₂ models

DLT/Digital Innovations for Climate

Climate Actions

Mitigation,
Adaptation,
Finance

Carbon Markets

Registries for
Permits and
Credits

Existing Markets

Differentiated
Low-carbon
Products

Supported by Digital MRV Systems linked to DLT

What is DLT (Blockchain)?

Distributed

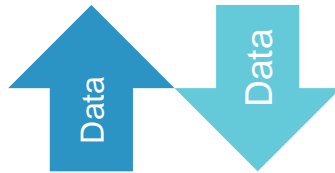
Peer-to-Peer
Shared so Everyone
Gets a Copy (Level of
Transparency Control)

Ledger

Spreadsheet
Database
Record Book

Technology

Consensus Algorithm to
Verify Agreement and Trust
Cryptography for Security



Internet Connected Meters
and Smart Devices

Bitcoin < Blockchain < DLT

Examples of DLTs	Explanation
Bitcoin	Blockchain as a Digital Currency, i.e. a financial application
Ethereum	Blockchain with Smart Contracts, more than digital currency applications, e.g. supply chains
IOTA	Not a blockchain, uses “Tangle” as a blockless distributed ledger; can link with other DLTs
Hashgraph (not actually a DLT)	“Swirlds” consensus algorithm not a DLT, but can be a front end for DLTs

DLT Benefits to Enhance MRV

Lower Costs and Faster Reporting

MRV Data and Calculations using Software based on Smart Standards and Smart Contracts

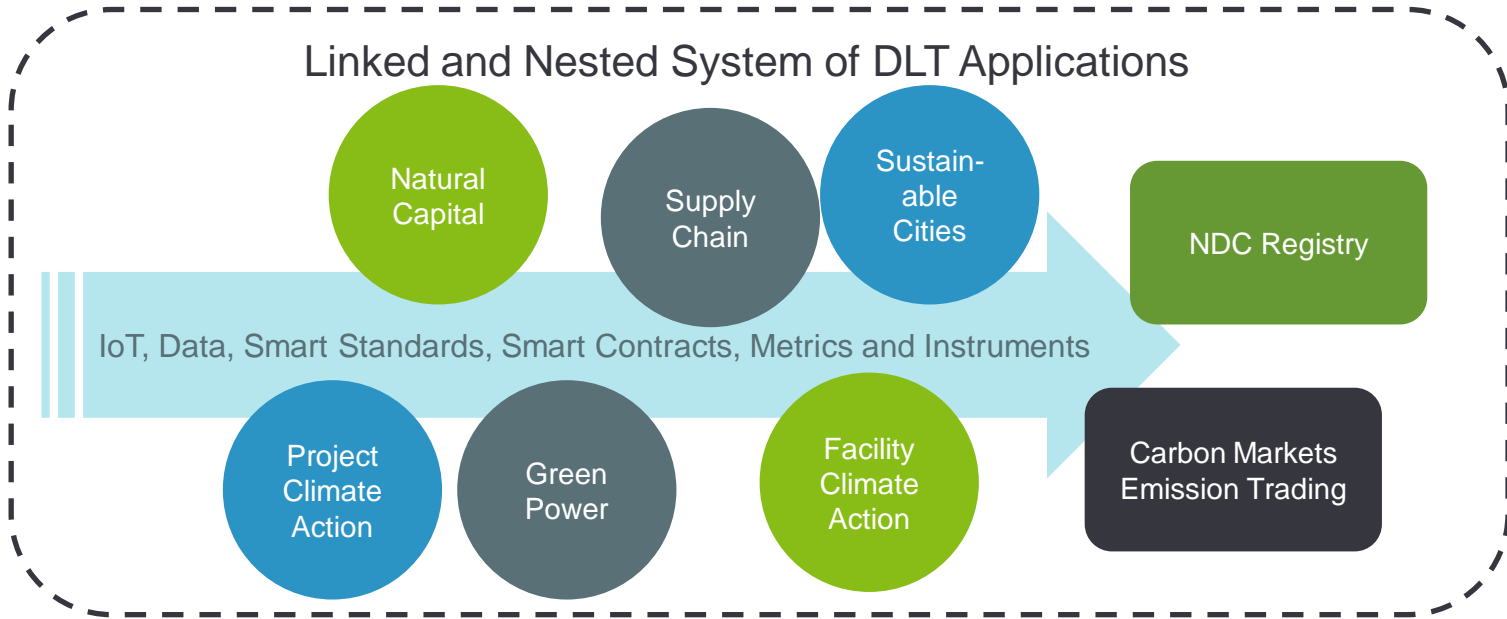
Data Integrity

Data Trail Traceability, Reduce Data Duplication and Avoid Double Counting across MRV Systems

Resilient and Scalable

Distributed Computer Networks, Extensible for New Climate Actions and Links for Policy Coherence

Mobilize Finance into Climate Actions



System Boundaries
e.g. Carbon Budget

Supporting Collaborative Governance System

Online Expert Communities

Consensus-based Mass Collaboration

Rules for MRV, Technical, Legal, Accounting

Interoperable Modular Rules Framework

Examples of DLT Companies + Initiatives

- Solar Coin
 - Climate Ledger
 - Xpansiv
 - CCEG Seratio Coins
 - DAO IPCI
 - Veridium
 - Climate Coin
 - Earth Token
 - Fintech4Good
- Provenance
 - Climate Chain Coalition
 - Power Ledger
 - Blockchain for Impact
 - Plastic Bank
 - Poseidon
 - Adaptation Ledger
 - Earth Dollar
 - Digital Green Finance

DIG4Climate Project

- Digital Innovation and Governance for Climate (DIG4Climate)
- On behalf of Government of Canada (funder) and in collaboration with Pacific Alliance countries – Chile, Colombia, Mexico and Peru
- Project funding = \$1.6M | Project duration = 4 years to March 2021 (leverages additional \$1.4M+ for MRV)
- Links to related projects to pilot blockchain for MRV (expectation to link with more pilots)

DIG4Climate Project Activities

- Multi-stakeholder engagement process of workshops and events in each of the Pacific Alliance countries
- Collaborate online collaboration platform and resources to support broader engagement and smart standards development
- 2018/Q1 – Capacity building workshops
- 2018/Q4 – 2019/Q1 – Practical design workshops
- 2019 – 2020 – Pilot testing with DLT/blockchain applications
- 2020/Q4 – 2021/Q1 – Recommendations and Roadmap

DIG4Climate Project Process

- Assess the **current state of MRV** and assess frameworks, taxonomies, processes within a “**MRV Maturity Model**”
- Assess the **current challenges** with MRV systems and the **opportunities/drivers** to move towards digital MRV
- Road-test some MRV Innovations with **pilot projects**
- Develop a **Roadmap** to transition from current MRV system to digital MRV system

Questions?