Green and Digital Transformation

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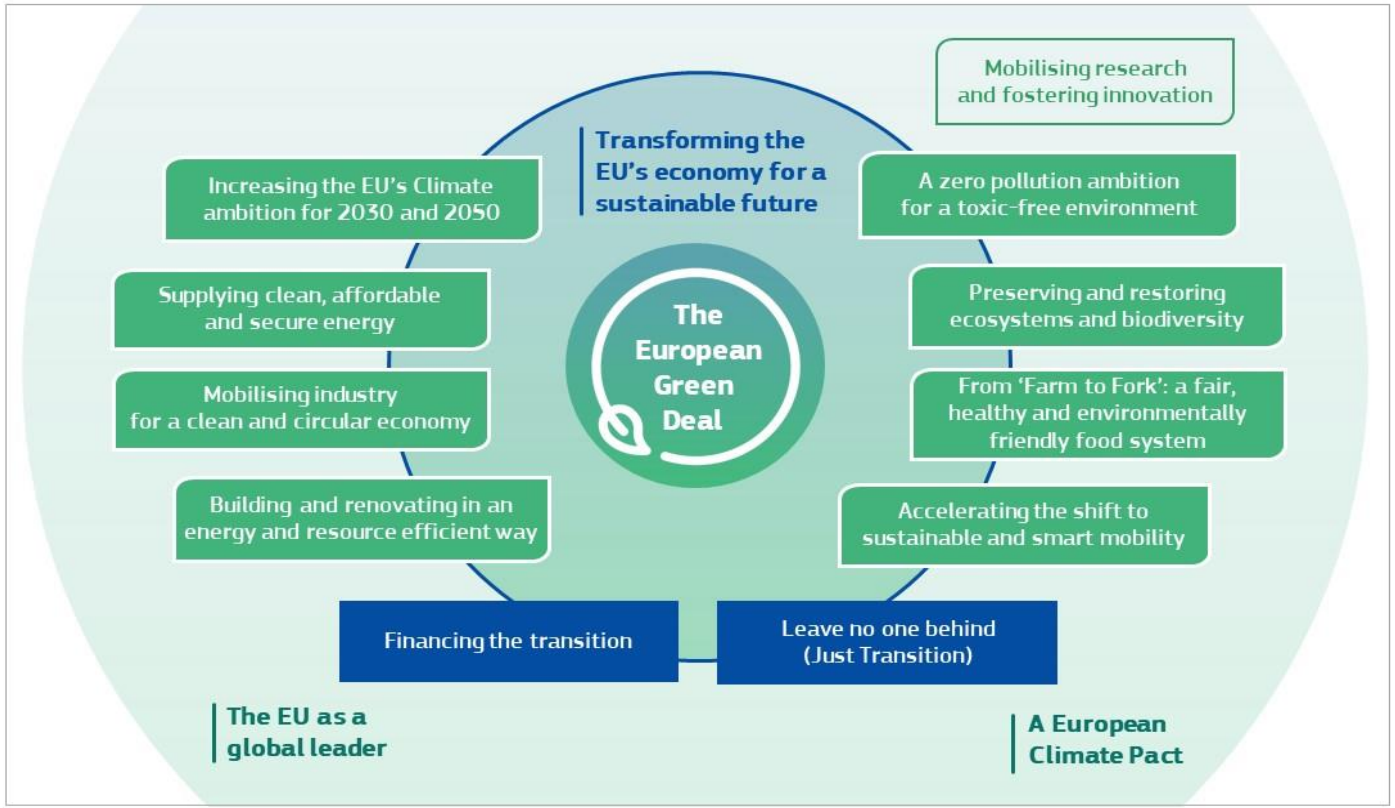
New Commission Priorities

- ***A European Green Deal***
- ***A Europe fit for the digital age***
- *An economy that works for people*
- *A stronger Europe in the world*
- *A new push for European democracy*

*'..a once-in-a-generation opportunity to ensure Europe leads the way on the **twin ecological and digital transitions**'.*

European Green Deal



Intersection between Green and Digital Transformation

- *Paris Agreement: need for innovations and technology pull and push*
- *Green and Digital transformation are taking place at the same time and are closely intertwined with each other*
- *Digital innovations (AI, Blockchain, IoT, supercomputing) provide unprecedented opportunities to enhance sustainability of economy & society*
- *Radical new thinking and business models are required- Business as usual will not be sufficient to address the climate crisis*
- *Getting innovations out of the lab into the market- Commercialization of digital clean tech solutions is an important challenge for Europe*
- *Scale-up of clean tech innovations: 2 valleys of death. Lack of early-stage financing and growth financing- most innovative startups leave Europe*

The environmental footprint of ICT

- *ICT: 8-10% of the electricity consumption, 2-4% of carbon emissions.*
- *Data centres all over the world alone are set to account by 2025 for as much as GHG emissions as all air traffic.*
- *e-waste: fastest-growing waste sources in the EU, 12 M tonnes by 2020.*
- *To produce a mobile phone 60 different metals are required, ~ 20 can currently be recycled, only 26 % of all phones are collected, less 15% recycled*
- *32 kg of raw materials are needed to produce a microchip weighing 2g.*
- *Life of digital devices, has steadily decreased between 1985 and 2015, the useful life of a computer was reduced from 11 to only 4 years.*

Green ICT
Improving energy and **material** efficiency of ICT

Examples

- Energy efficiency of datacenters
- Lifespan of electronic equipment
- Transparency on the carbon footprint of ICT infrastructure
- ‘eco-labelling’ and green public procurement

Dual role of ICT in sustainability

ICT for Sustainabilty & Climate Action

ICT can reduce 15-20% of total Greenhouse Gases

7-10x more GHGs than it's own footprint

- Digitalisation for stable decarbonized energy grids
- Precision farming, digital for agri-food
- Climate smart cities & communities
- Smart mobility, energy efficiency of buildings
- Sustainable manufacturing and waste treatment
- Extreme weather and climate impact modelling

Digital matters for SDGs and the Green Deal

European Commission

Digital Europe Programme

1. **Supplying clean affordable and secure energy** – *Digitisation of decarbonised (smart) grids*

2. **Mobilizing industry for clean and circular economy** - Digital is a key enabler for circular economy (sharing, servitisation, virtualisation). ICT sector needs to improve energy and material efficiency- extending the lifetime of all smartphones in the EU by 1 year would be equivalent of taking a million cars off the roads.

3. **Building and renovating** in energy and resource efficient ways – ICT can improve energy efficiency of buildings by 15-25%

4. **Accelerating the shift to sustainable and smart mobility** – digitally enabled Mobility as a Service, CAD, shared mobility

5. **From 'Farm to Fork'** – Precision agriculture can lead to 25% savings in Fuel, 15% reduction in seeds and fertilisers. Enabling crop protection service leading to significant reduction of pesticides & fertilisers

Green-Digital Transition & SMEs – Relevant EU policies and programmes

- Shaping Europe‘s **Digital** Future
- European Strategy on **Data**
- **Circular economy** action plan
- SME strategy

The European Green Deal (EGD)

- EU Investments:
  - Horizon Europe: Research and Innovation
  - Digital Europe: Support Deployment
  - Connecting Europe Facility 2: Infrastructure
  - NextGenerationEU – Recovery and Resilience Facility
  - Invest EU: Investment support

Boosting investment in Digital Clean Tech

- *Digital technologies, such as artificial intelligence, IoT and blockchain are playing an increasingly critical role for climate change mitigation and adaptation across multiple sectors*
- *Enabling role of digital technologies: enable reduction of between 10-15% of GHG emissions by 2030*
- *Underinvestment in green tech SMEs and startups due to their high-risk profiles, capital intensity, lack of collateral and long-term financing needs*
- *Annual investment gap for digital cleantech of €6 billion per year in Europe (total annual investment $16 billion globally, with North America ($10 bill)*
- *EU-SME Strategy for a Sustainable and Digital Europe: Digital Clean Tech Investment Program to pool resources from EU, MS and National Promotional Banks*

InvestEU- Digital and Green

- *Address the existing investment gap for digital clean technologies in Europe*
- *Key priority for InvestEU Program: support strategic digital technologies that support climate change mitigation and adaption, reduce GHG emissions and enhance the circularity of the economy*
- *Digital Clean Tech Investment Program to pool EU resources with funding from Member States (RRF), IFIS (EIB, EBRD, IFC); National Promotional Banks and private investors.*
- *Enhance the access to equity and growth finance for innovative, digital startups and SMEs that develop and adopt digital clean technologies*
- *Investment platform to facilitate co-investment and better link innovators with investors EU funding*
- *Advisory services to support SMEs and startups to develop bankable projects*

EU Blockchain Strategy

European Commission

ESTABLISHING GLOBAL LEADERSHIP IN BLOCKCHAIN AND DISTRIBUTED LEDGER TECHNOLOGIES

JOINED-UP POLITICAL VISION (EU-MS)

JOINT DECLARATION ON THE ESTABLISHMENT OF THE **EUROPEAN BLOCKCHAIN PARTNERSHIP** [EBP] AND THE DEVELOPMENT OF THE **EUROPEAN BLOCKCHAIN SERVICES INFRASTRUCTURE** [EBSI] FOR CROSS-BORDER DIGITAL SERVICES OF PUBLIC INTEREST

PUBLIC-PRIVATE PARTNERSHIP

SUPPORTING THE CREATION OF **THE INTERNATIONAL ASSOCIATION OF TRUSTED BLOCKCHAIN APPLICATIONS** [INATBA]; A MULTISTAKEHOLDER ORGANISATION TO PROMOTE TRUST AND INTEROPERABILITY AT GLOBAL LEVEL

CONNECTING GLOBAL and EUROPEAN EXPERTISE

THE **EU BLOCKCHAIN OBSERVATORY AND FORUM** BRINGS TOGETHER THE LEADING GLOBAL EXPERTS TO IDENTIFY OBSTACLES, INCENTIVES AND PRACTICAL SOLUTIONS TO PROMOTE BLOCKCHAIN UPTAKE.

INVESTING IN EU RESEARCH, INNOVATION AND START-UPS

THROUGH THE CONNECTING EUROPE FACILITY AND H2020 PROGRAMMES, THE EU IS COINVESTING IN THE MOST ADVANCED DIGITAL INFRASTRUCTURE AND THE MOST INNOVATIVE EU START-UPS

NEW EU INVESTMENT SCHEME FOR AI AND BLOCKCHAIN + SUPPORT PROGRAMME

PROMOTING AN ENABLING DSM LEGAL FRAMEWORK, INTEROPERABLE STANDARDS and SKILLS DEVELOPMENT

Why Blockchain?

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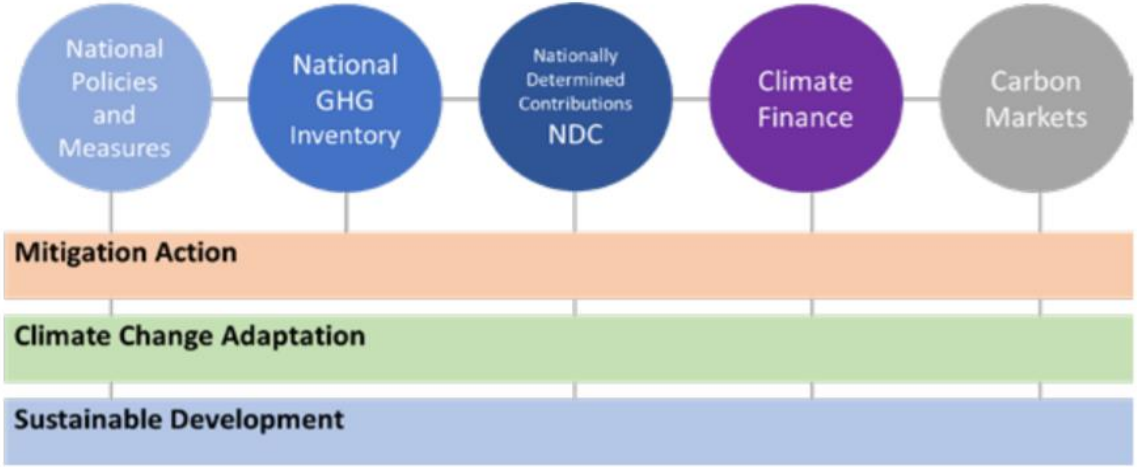
- Brings trust to digital transactions
- Efficiency, lower transaction costs and secure (e.g. traceability, real-time data)
- Effective to verify and validate data (peer-to-peer network)
- Decentralised data governance model
- Enhance transparency and accountability (immutable ledger)
- Transformative capacities (disintermediation, digital payments)
- Provides incentives for behavioural change (tokenisation)
- Convergence of Blockchain with IoT and AI

Key Challenges

- Energy Consumption (Proof of work vs Proof of stake)
- Interoperability (Open Standards)
- Technological Maturity
- Scalability (permissionless vs permission blockchains)
- Data Quality (data controls at entry)
- Data protection and privacy
- Regulatory Framework (regulatory sandbox)

Paris Agreement: Information flow



- enable and transparent information flows & data exchanges
- support evaluation of NDC targets (national measures)
- improve tracking of GHG reductions across sectors
- facilitate climate financing through improved visibility and credibility of mitigation actions (international cooperation)

Blockchain for Climate Action

European Commission

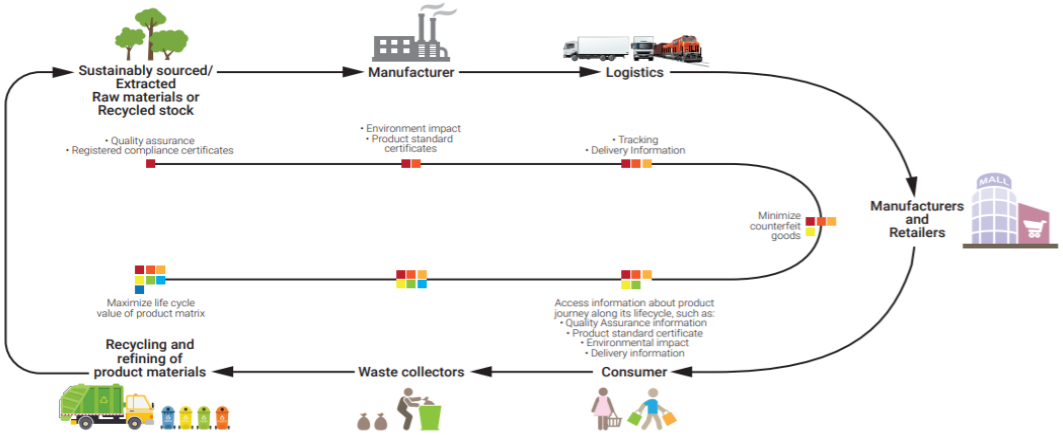
- Enhance traceability and transparency along global supply chains
- Improve the Measuring, Reporting & Verification of GHG emission
- Make carbon markets more efficient and transparent
- Expand the access to sustainable finance and innovative financing
- Provide incentives for businesses and citizens to change behaviours (rewards for climate-friendly actions through tokens)

Paris Agreement and blockchain

European Commission

Needs of Paris Agreement		Features of Blockchain
• Information sharing & Review mechanisms	⇔	Trust in transactions through peer-to-peer network
• Accountability	⇔	Verification & time-stamps
• Decentralised hybrid approach	⇔	Decentralized data system using consensus
• Measuring, reporting & Verification of emissions	⇔	Immutable data records for increased traceability and trust
• Public-private partnerships	⇔	Consensus mechanism through public-private stakeholders

1) Traceability along supply chains



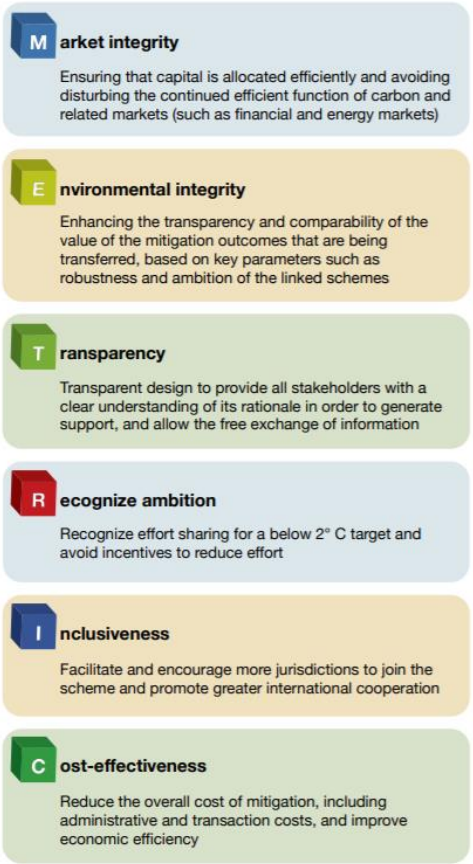
- Transaction along the supply change can be monitored and tracked through immutable records
- Transparency and traceability of products from source to end consumers
- Provides control & compliance mechanism by connecting all stakeholders in a global supply chain

2) Measuring, Reporting & Verification

- Unlock more accurate ways to measure, report and verify climate outcomes at lower transaction costs
- Improved access to real-time, transparent and trustworthy GHG emissions data
- Smart contracts enable efficiency gains and automised issuance, transfer and payment systems
- Enhance data-driven decision-making by policy makers, consumers and investors
- Facilitate access to carbon markets & results-based financing for private sector actors

⇒ Digitalizing MRV is based on convergence of digital technologies (IoT, blockchain and AI)

3) Efficiency of Carbon Markets



- Optimize existing carbon market platforms
- Create new opportunities for carbon credit transactions
- Smart contracts can enhance the Transparency and credibility of Carbon markets
- Improve links between existing markets and national registries
- Reduce transaction costs (time and cost savings)

4) Innovations and Incentives

- Blockchain-enabled platforms can expand the access to sustainable finance and impact investments
- provide efficient, fast and transparent cross-border payment systems (i.e. reforestation programs)
- Tokenized Economy- enables business innovations to provide efficient and transparency services
- Blockchain-based services provide incentives for businesses and citizens to change behaviours
- Rewarding climate-friendly actions by issuing financial rewards in the form of tokens (i.e. Plastic Bank)

Thank you!

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Backup slides

New EU commitments to Greening ICT

Legislation, financing of Innovation and cooperation

European Digital Strategy – 19.2.2020

- A circular electronics initiative
- Sustainable data centres by no later than 2030
- Transparency measures for electronic communications

A European Strategy on Data -19.2.2020

- A Common European Green Deal data space
- EU data space for smart circular applications

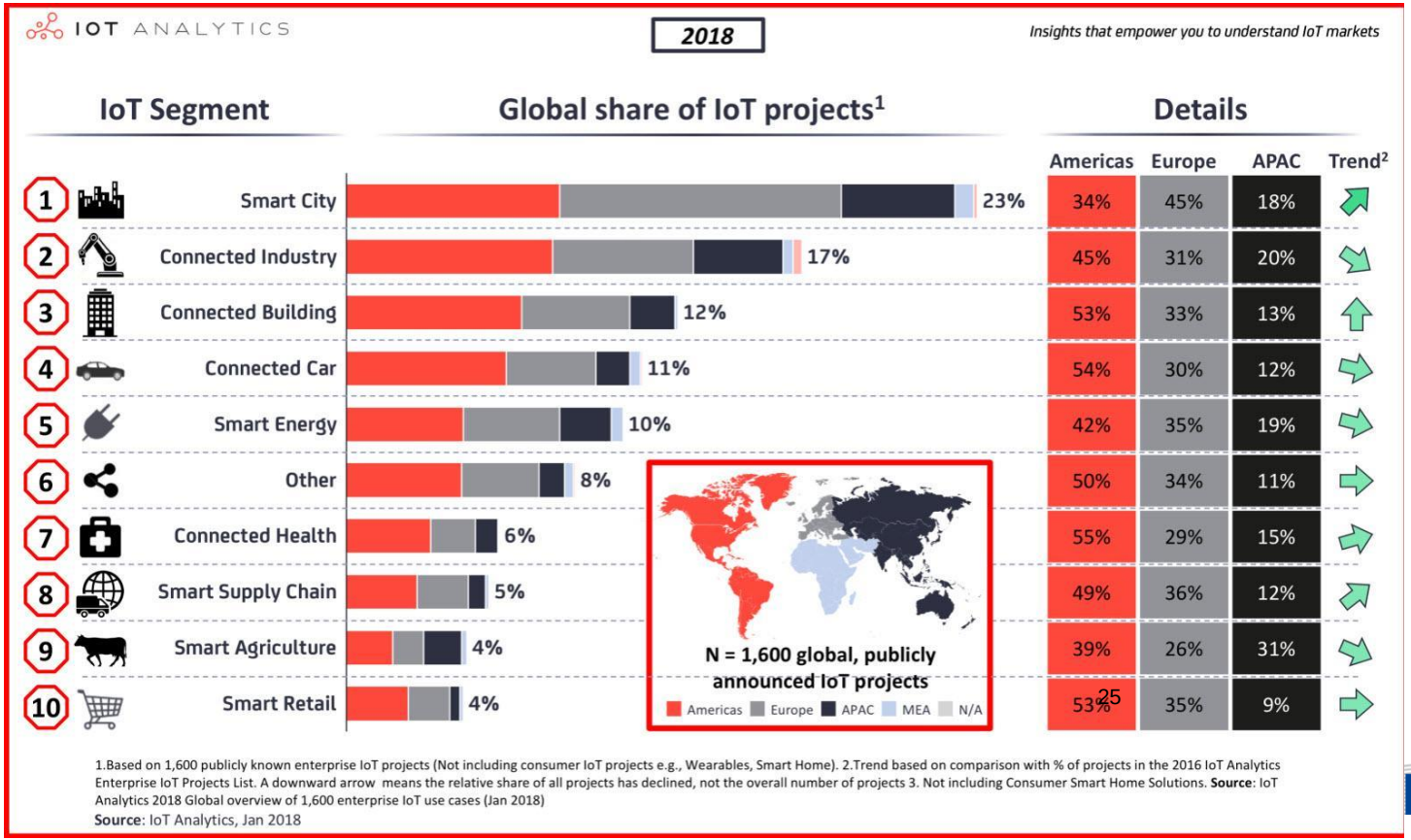
The European Green Deal

Circular Economy Action Plan – 11.3.2020

- Regulatory measures for mobiles, tablets, laptops, printers and consumables chargers
- 'right to repair', including a right to update obsolete software

More details in EuroDIG PL4 Wiki

IoT across Industry



Smart Cities & Communities

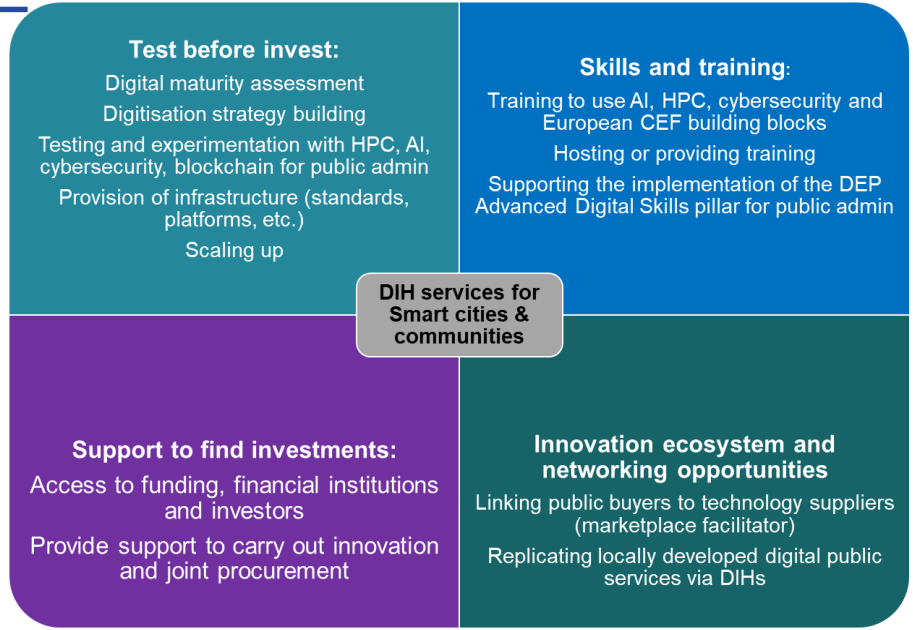
European Commission

Opportunities for SMEs

JOIN, BOOST, SUSTAIN

Living-in.EU
The European way of digital transformation in cities and communities

https://www.living-in.eu/we-support



Engage with AI Testing & Experimentation facilities and Digital Innovation Hubs for smart cities (eg through EEN)

Implement the Minimum Interoperability Mechanism for platforms, data models and use of AI: https://oascities.org/minimal-interoperability-mechanisms/

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