Environmental Sustainability of Blockchain

25 April, 14:00-15:45 - Online Workshop

Agenda

14:00-14:05 Introduction & Updates on the Focus Group's Catalogue of Blockchain Solutions – Alexander Chourreau (Tech Policy Officer & Focus Group coordinator)

14:05-14:15 Updates on the BlockStand project – Serena Dell'Agli (Senior Technology Manager & BlockStand coordinator)

14:15-14:25 Keynote Opening – Pierre Marro (Policy Officer - DG CNECT, European Commission)

14:25-14:35 Presentation of the Draft Technical Report – Belen Suarez (BlockStand Funded Expert)

14:35-15:30 Stakeholder Input & Open Floor

- Belen Suarez (Moderator)
- Tom de Block (Steering Board Vice-Chair of the Alliance for Internet of Things Innovation)
- Grzegorz Cenkier (Standardisation Expert – ISO TC 307 on Blockchain & DLTs)
- Eric Cohen (Cohen Computer Consulting & Standardisation Expert at ISO TC 307 on Blockchain & DLTs)
- Lena Klaasen (Co-founder of the Crypto Carbon Rating Institute)

15:30-15:40 Presentation of CEN-CENELEC's new use cases survey on measurements of blockchain's environmental impact – Christian Grafenauer (Standardisation Expert – CEN-CENELEC JTC19 on Blockchain & DLTs)

15:40-15:45 Conclusion - Alexander Chourreau (Tech Policy Officer & Focus Group coordinator)

Focus Group Blockchain & DLT - Updates

Alexander Chourreau – Focus Group Coordinator

New Community for Blockchain Innovators

- **Launch of the Group:** December 2023
- Align more closely the business, policy and standardisation spheres behind blockchain, **for the benefit of SMEs**
- Close alignment with **BlockStand**

Catalogue of Blockchain Solutions

- **New initiative:** display your company's solution(s) across a 45 000 strong community
- Organisation of **matchmaking sessions** between relevant companies
- Publication of a **Report on European SME Blockchain Solutions** (end 2024)

Submit your solution before the next Group meeting!

Looking ahead

- **Internal meetings:** to be reserved to Focus Group members only
- Election of the **Group's Chairs**
  - Drive the activities of the Group with the coordinator, formulate advice on topical issues
  - At minimum 1 chair from a DIGITAL SME member, and 1 chair from the BlockStand community

… Join the Focus Group!

Updates on the BlockStand Project

Serena Dell'Agli – BlockStand coordinator

BlockStand open call

Continuous, open and inclusive experts' selection (bi-monthly cut-offs) - Next cut-off date: 15 June

Open for submissions until February 2025

Total amount: 400.000 EUR

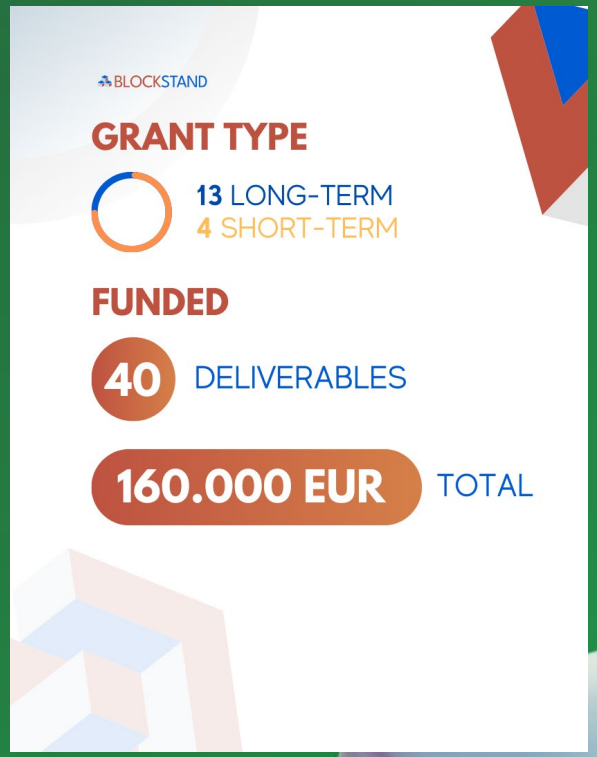
- **30-40 experts** and **100** expert contributions
- Choice between short-term (3 months / 1 deliverable) or long-term (6-9 months / 2-3 deliverables) contributions
- Following deliverables are expected: technical reports; new work items suggested in TCs; other outputs of TC participation; blockchain standards use case analysis; etc.

https://blockstand.eu/experts-selection/

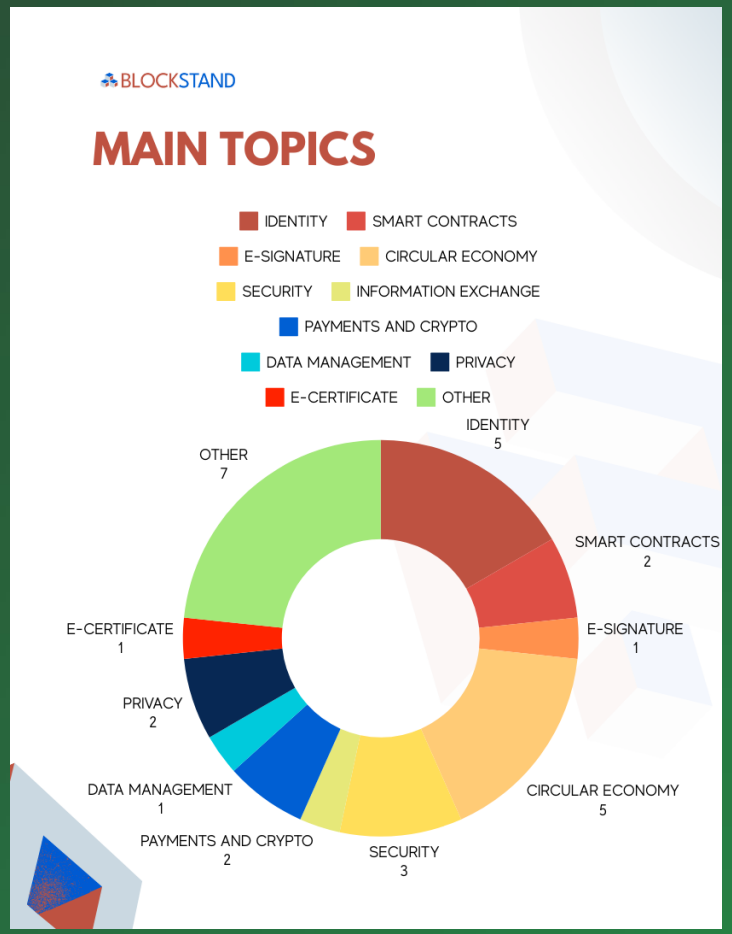
Experts & contributions

In its first year, the Project has supported 17 experts coming from 10 EU Countries

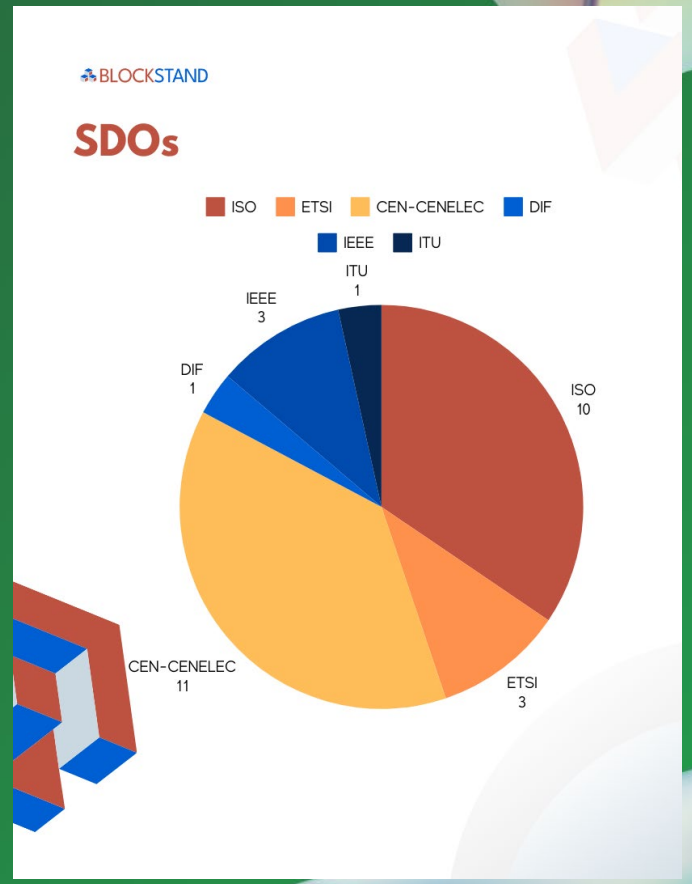
The experts have applied mostly for long-term contributions for a total value of 160K EUR



Experts are supported in their work related to different topics and EU priorities

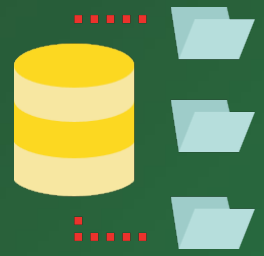


Expert contributions involve different SDOs, both at European and international level



Coming soon

Report on Blockchain inclusion to the Rolling Plan



Repository of Blockchain standardisation activities

Standardisation Gaps & Recommendations' Atlas

Experts’ success stories - Europe's Blockchain Leadership Outlook

Thank you for your attention!

For more information:

Serena Dell'Agli, Senior Technology Manager (s.dellagli@digitalsme.eu)

Follow us on LinkedIn: BlockStand.eu

Keynote speech

Pierre Marro – Policy Officer (DG CNECT – European Commission)

Digitalisation and 3-dimensional Sustainability

Economic

Economic resilience, decent jobs, growth

Social

Equity and social justice, poverty alleviation, education, lifelong learning, health, wellbeing, inclusion, culture, social cohesion, resilience and disaster preparedness

Environmental

Climate change, pollution, biodiversity loss

Is Digitalisation in the service of sustainability or driven by other priorities?

Can digital solutions (e.g. smart grids, connected mobility, teleworking, precision farming, blockchain) deliver a triple win: environmental, social well-being and economic development?

Digitalisation can be in service of sustainability, but this is not by design!

The Nexus of Green Transition and Digital Transformation

- Green transition and digital transformation are top policy priorities … but their interplay is a challenge
- ICT: Part of the problem or the solution?
- **How to green digital?**

  Green transition may block certain digitalisation patterns (built-in obsolescence, blockchain mining, single-use electronics, etc
- **What digital can do for green?**

  Digital transformation for climate neutrality. It can reduce 15-20% of total GHG emissions

The Nexus of Green Transition and Digital Transformation

- **Conflicts:**
  - Measurable (energy and material consumption, e-waste)
- **Synergies:**
  - So far expressed as ‘potential’ figures of enablement. To realise potential we need science-based and standardized metrics.
- Metrics would enable:
  - Sustainable finance for digitalisation (see EU Taxonomy Delegated Act on Climate Mitigation)
  - Green Public Procurements – GPP criteria exist for datacentres
  - Market growth of green digital solutions in major sectors such as energy, transport, construction, agriculture, etc.

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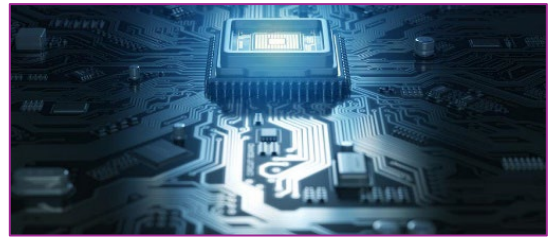
Towards Sustainable Digital Technologies

- Since 2013: Codes of Conduct for Data Centres and Broadband Equipment
- Since 2018 European Processor Initiative to develop in low-power processors
- 09.12.21: EU Taxonomy Climate Delegated Act – in force
- 18.10.22: Action Plan on Digitalising the Energy System

Develop an energy-labelling scheme for computers and evaluate a possible revision of the eco-design regulation on servers and data storage products. Explore the possibility to develop common indicators for measuring the environmental footprint of electronic communications services.	Q. IV 2023
Establish an EU Code of Conduct for the sustainability of telecommunications networks.	Q. IV 2025



- Circular Electronics Initiative for circular design of electronics & IoT

Transition to Circular economy

Sustainable products – durable, re-usable, reparable, refurbishable, …recyclable

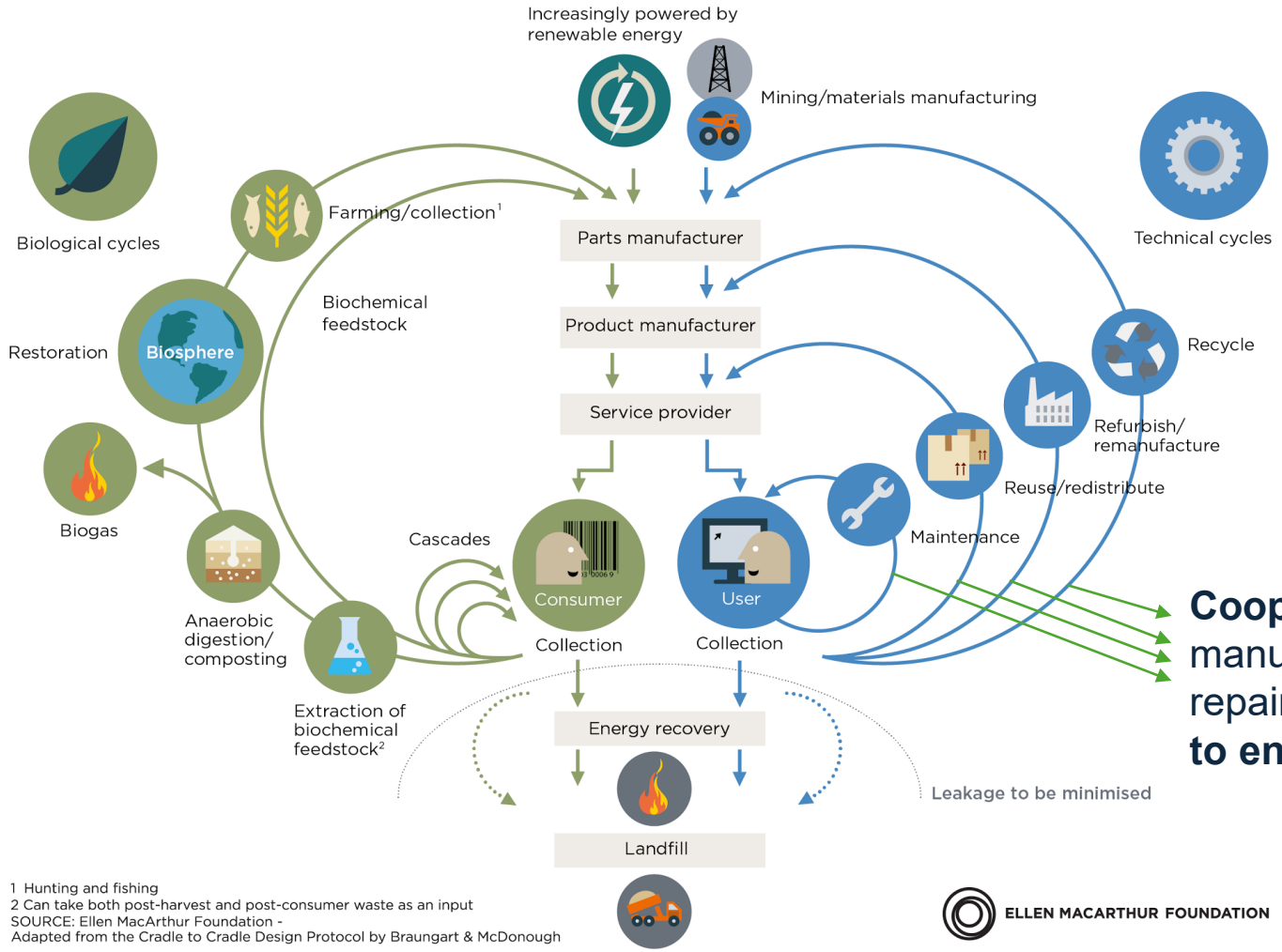
Sustainable Business models – e.g. Product as a service, sharing platforms

Key enabler: Digital Product Passport

Recent EU legislations:

- Ecodesign for sustainable products - European Commission – product requirements, information requirements across who supply chain, **Digital Product passport** (30.3.2022)
- Empowering consumers for the green transition - European Commission (30.3.2022)
- Proposal on the Directive on Green Claims (22.3.2023)
- Proposal for a Directive on common rules promoting the repair of goods (22.3.2023)

Circular Economy – Key for Sustainability



Cooperation among manufacturers, retailers, repairers, recyclers, is **essential to enable** these ‘circles’

[The Butterfly Diagram: Visualising the Circular Economy (ellenmacarthurfoundation.org)]

Digital Product Passport – Expected Benefits

Tracking of **raw materials extraction/production**, supporting due diligence efforts

Enable **manufacturers** to create products **digital twins**, embedding all the information required

Tracking the life story of a product, enabling services related to its **remanufacturing**, **reparability, re-use/re-sale/second-life, recyclability**, new business models

Benefit **market surveillance authorities and customs authorities**, by making available information they would need to carry out their tasks

Make available to **public authorities and policy makers** reliable information. Enable to link **incentives** to **sustainability performance**

Allow **citizens** to have access to **relevant and verified information** related to the characteristics of the products they own or are considering to buy/rent (e.g. using apps able to read the identifier

EU policy actions for Blockchain & DLT Technologies

1. Public sector as trailblazer (EBP and EBSI)
2. Legal certainty
3. Supporting R&I
4. Closing the Knowledge Gap
5. Supporting global cooperation
6. Supporting Standardisation
7. Specific attention for solutions contributing to the EU green agenda

Blockchain/DLT Standardisation Activities

- Liaising with Standardisation bodies (ISO, ETSI, CEN-CENELEC, ITUT…) and associations like INATBA
- Supporting blockchain standardisation community (EU experts in ISB activities)
- Other dedicated support to standardization, eg for specific implementing act

Concerning Blockchain/DLT for sustainability

- Digital energy action plan (Oct. 2022):
  i. Energy communities and local energy initiatives (peer2peer solutions)
- Study on the potential of Blockchain technology and other digital tools in facilitating EU Climate Policy implementation – DG CLIMA

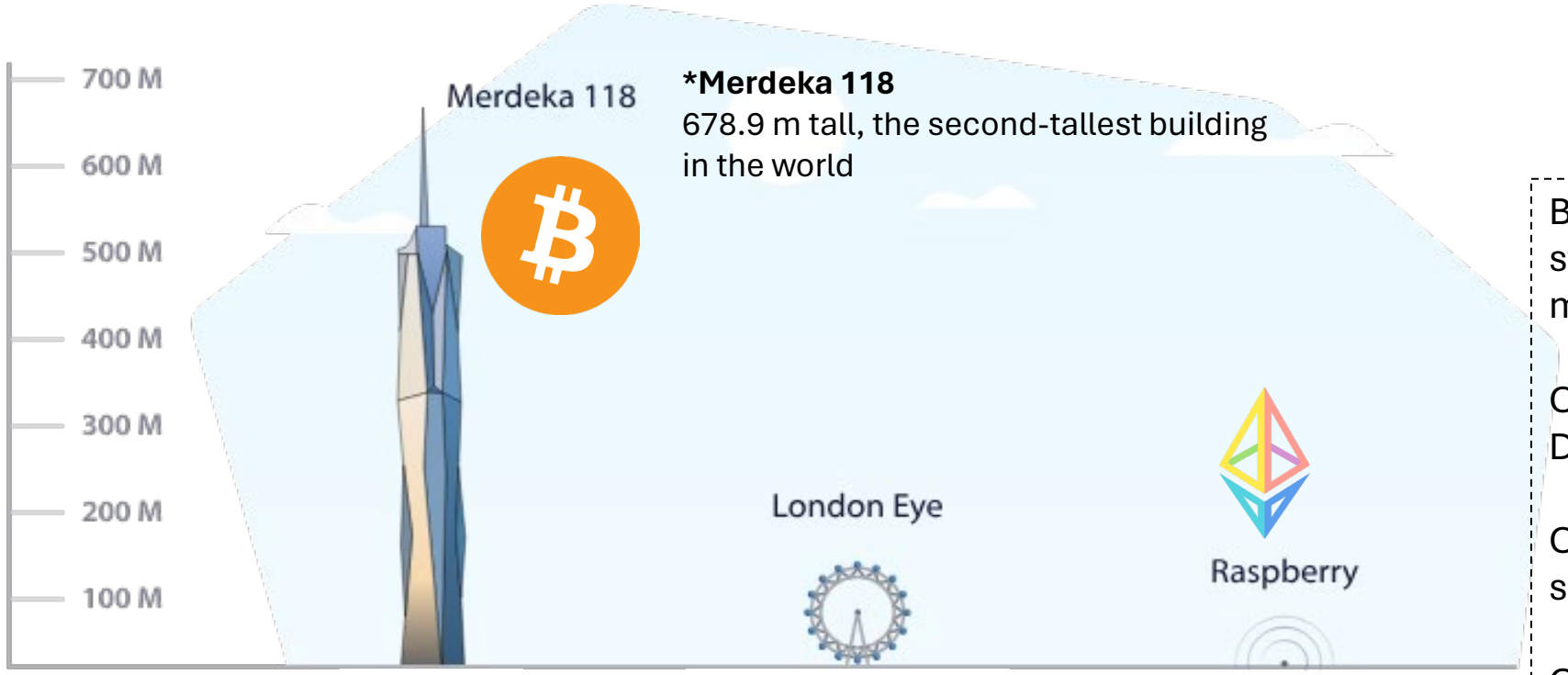
  e.g. Potentially a role for ETS emissions (trading /reporting) and others
- Proposal for Eco design for sustainable product regulation (March. 2022) – Already advanced on Battery. E.g. CIRPASS project at EU level working on DPP

  Blockchain can provide for it, e.g. by implementing Digital passport product. (various projects or initiatives already launched)

  EBSI traceability use cases (both with the current solution and future evolution of EBSI)
- Reports of the European Blockchain Observatory and Forum (EUBOF)

Energy Consumption of Ethereum

- **Ethereum**, second largest crypto currency after **Bitcoin**, has recently changed its consensus mechanism* to reduce environmental impact and increase the scalability of the network
- This change of algorism cut Ethereum's energy usage by **99%**



BUT: clear, harmonised, standardised methodology is still missing

Comparison between blockchain / DLT solution

Comparision with other digital solution

Comparison/contextualisation with no or non IT

Source: Cambridge Bitcoin Electricity Consumption Index

Concerning the sustainability of blockchain

- EC regulation: MICA (transparency on climate impact), e.g. with the report to be made after 2 years on the environmental impact of crypto-assets and the introduction of mandatory minimum sustainability standards
- Digital energy action plan (Oct. 2022):

  A report by 2025 that includes a description of the environmental and climate impact of new technologies in the crypto-asset market (synergies with MICA)
- Need for methodology / standardisation concerning the sustainability of blockchain
- EBSI to implement eco-friendly solutions (Proof of Authority), working on PCP for even less energy consuming solutions
- EUBOF report(s) on sustainability of blockchain

Presentation of the Draft Technical Report

CEN/CENELEC JTC 19 WG 2
Environmental Sustainability for Blockchain and DLT

Belen Suarez (Convenor)

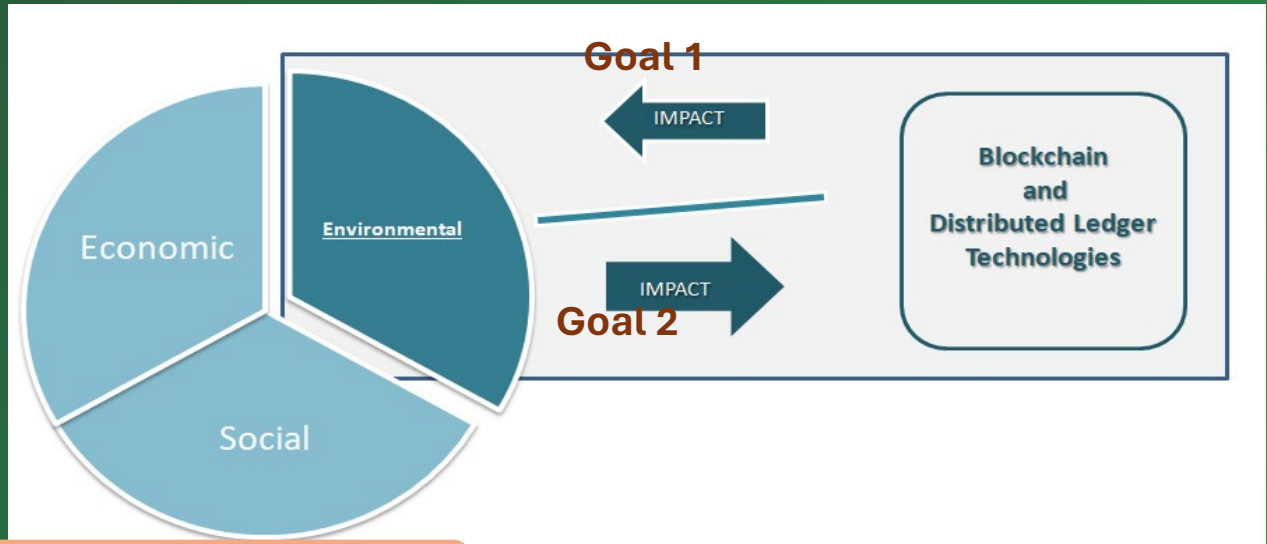
Purpose

- Integrate environmental sustainability considerations to support the pre-commercial and commercial applications of blockchain:

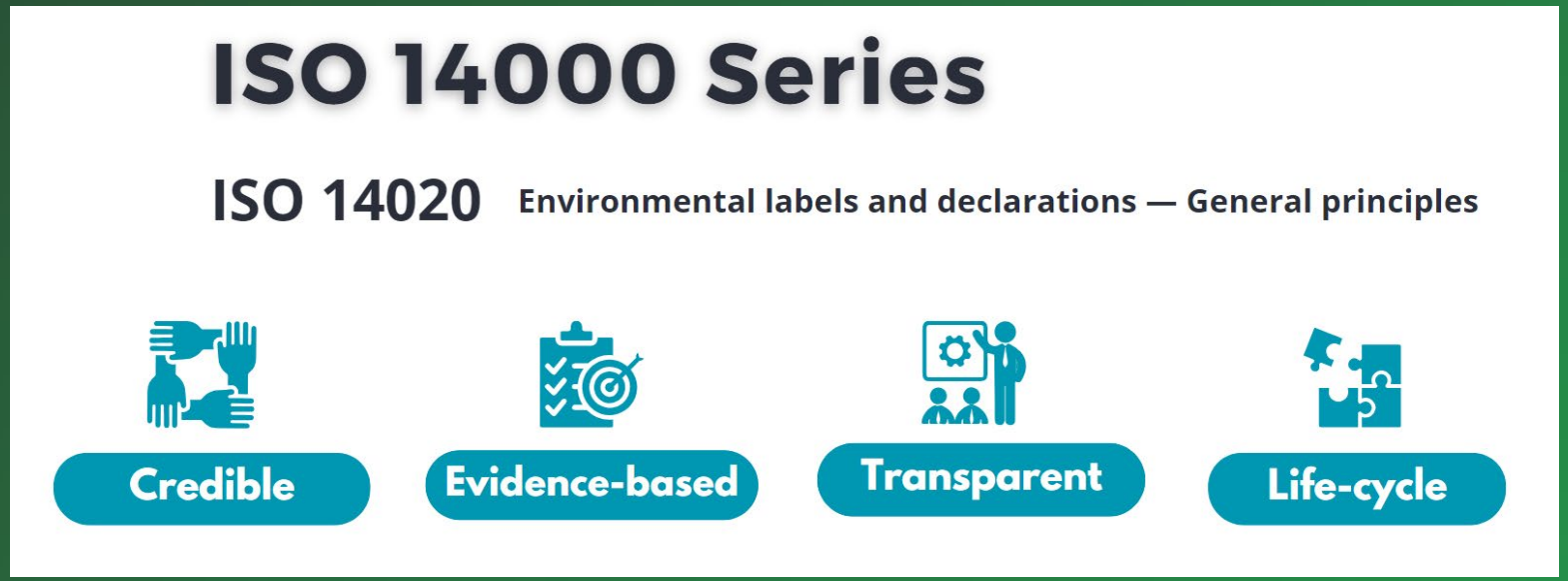
  - ✓Support to UNDERSTANDING, MEASURING, MANAGING and REPORTING
  - ✓Allowing proactive RISK MANAGEMENT
  - ✓Generating TRUST
  - ✓Facilitating STAKEHOLDER ENGAGEMENT
  - ✓Disseminate blockchain ADOPTION

Approach & Documents

1. TR- Environmental and Sustainability classification methodology of consensus mechanisms
2. TS – Sustainability Taxonomy of applications based on Blockchain and DLTs



Environmental Sustainability - Standards Reference



PROBLEM

Data availability
Data reliability
Harmonized indicators
Proper Methodology
Reporting

Proportionality
Materiality
Innovation
SME inclusion
Single Market

ADDED VALUE OF THE WORK

•**European Securities and Markets Authority** - to develop regulatory technical standards on the environmental and climate-related impact of the consensus mechanism used to issue the crypto-assets (MiCA Regulation).

• **European Commission** – to digitalize the energy system **- EU action plan** supports the comparability and creation of energy efficiency labels for Blockchain and DLT (infrastructure and services)

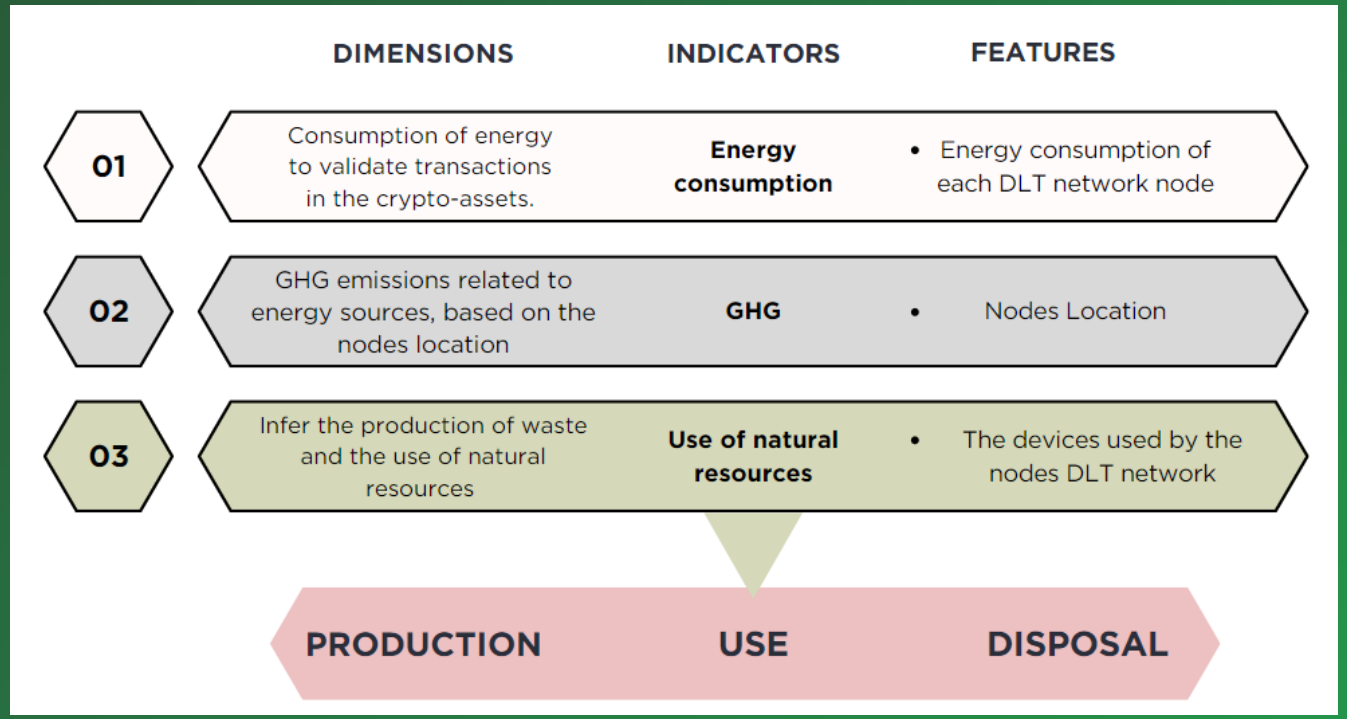
•**European Blockchain Services Infrastructure** - capacity to support green public procurements of governmental agencies for Blockchain technologies (including future pre-commercial procurements)

•**Industry** - to comply with new regulatory requirements, necessity to broaden the quality and scope of sustainability reporting, by measuring and monitoring sustainability-related risks more effectively

… + Society and Planet!!

MARKET NEEDS

❖ **ESMA: comparability** among solutions' environmental sustainability is best ensured with indicators based on harmonised methodologies and quantitative metrics, which must be anchored in common methodological principles.



Stakeholder Input & Open Floor

Belen Suarez - *Moderator* (BlockStand Funded Expert)

Tom de Block (AIOTI)

Grzegorz Cenkier (ISO TC 307)

Eric Cohen (Cohen Computer Consulting)

Lena Klaasen (Crypto Carbon Rating Institute)

Presentation of CEN-CENELEC's new use cases survey

Measurements of blockchain's environmental impact

Christian Grafenauer (CEN-CENELEC JTC19)

Call for Participation

- **WG2 Invitation:** Join our blockchain standards initiative
- **Focus on Diversity:** Encouraging participation from all relevant Stakeholder groups
- **Impact:** Help shape the future of blockchain standards

The Need for Sustainable Blockchain Solutions

- Blockchain is heralded for its security and transparency, but its environmental footprint is less understood
- This gap in understanding and implementation highlights the urgency of integrating sustainability into blockchain frameworks at all levels

Stakeholder Engagement

- **All-Inclusive Approach:** Engage technologists, policymakers, sustainability experts and business leaders
- **Multi-Stakeholder Benefits:** Diverse insights for balanced standards
- **Enhanced Compliance and Adoption:** Achieved through broad involvement

Risks of Missing Sustainability Experts

- Impact on Credibility
- Greenwashing Concerns
- Unintentional Misrepresentation
- Sustainability Expertise is Crucial
- Potential for Low-Impact Standards

Stakeholders

Relevant Stakeholders:

- Civil society representatives
- Small players and SMEs
- **Sustainability experts**
- Technical experts
- Policymakers

Agnostic and Consensus-based Standards

- **Neutral Standards:** Applicable across all industries and technologies
- **Consensus Driven:** Developed through European-wide agreement
- **Future Ready:** Adaptable to emerging technologies and mechanisms

Survey Introduction and Engagement

- **Survey Introduction:** 12 Questions
- **Engagement:** Reach out to us
- **Your Voice Matters:** Influence the standards development process

Questions 1/2

1. Is Blockchain/DLT technology used in your organisation?
2. Do you know what consensus algorithm is used in the system?
3. Do you consider the environmental impact when choosing a consensus algorithm?
4. Are you aware of the environmental sustainability impact of the established incentive structures to participate in the network?
5. Does your cloud solution provider or otherwise hosted network nodes use sustainable energy?
6. Are you using cloud solutions that offer blockchain technology?

Questions 2/2

7. Do you estimate or collect any information on the environmental impact of your solution?

8. Do you have a concrete methodology to assess the environmental impact?

9. What indicator/s do you use for environmental assessment: (e.g.: energy consumption, natural resources, greenhouse gas emissions, etc?

10. Do you know how many network nodes are in your blockchain/DLT?

11. Do you have network analysis tools in place to monitor nodes?

12. Are you conducting an analysis of natural resource use based on an analysis of the production, use and disposal of DLT network node equipment?

Q&A and Feedback

Conclusions

- **Get involved!**
  - ✓ Join the Focus Group & Submit your Blockchain Solution to the Catalogue
  - ✓ Complete the CEN-CENELEC use cases survey

- **For more information:**
  - Alexander Chourreau – Tech Policy Officer & FG Coordinator (a.chourreau@digitalsme.eu)
  - Belen Suarez – CEN-CENELEC JTC19 WG2 Convenor & BlockStand Funded Expert (bsl1172@gmail.com)