MiCA Crypto Alliance

Blockchain-Level vs Asset-Level ESG Disclosures

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Blockchain-Level vs Asset-Level ESG Disclosures Under MiCA

MiCA sustainability indicators originate from the consensus mechanism, but the disclosure unit is the crypto-asset. As a result, sustainability disclosures must be asset-level.

MiCA sustainability disclosures raise a practical question in the market:

If a token is built on a major Layer-1 network, can it meet its MiCA environmental disclosure requirements by reporting only network-level data? In other words, what should a white paper or a CASP website disclose for a token such as USDC on Ethereum: the environmental metrics of USDC, or those of the Ethereum network?

At first glance, reporting at the network-level only might appear acceptable. Both Regulation (EU) 2023/1114 on markets in crypto-assets (MiCA) and Commission Delegated Regulation (EU) 2025/422 require disclosure of sustainability indicators “of the consensus mechanism”. This would appear to suggest that network-level disclosures may be sufficient.

In practice, this interpretation does not hold. Professional providers of crypto sustainability data publish asset-level data rather than merely network-level data, and this is not accidental. This article examines this issue in greater depth.

What MiCA Requires

Under MiCA, sustainability disclosures are governed by Articles 6, 19, 51 and 66(5) of Regulation (EU) 2023/1114 and further specified in CDR 2025/422.

The framework introduces a structured set of mandatory and optional environmental indicators that must be disclosed in a standardised format.

These include, among others:

- Annual energy consumption linked to transaction validation and ledger maintenance
- Energy intensity per transaction
- Scope 1 and Scope 2 greenhouse gas emissions
- Greenhouse gas intensity
- Renewable energy share
- Waste generation, including waste electrical and electronic equipment
- Water consumption
- Methodology and source disclosures supporting the calculations

CDR 2025/422 specifies that sustainability indicators relate to the "consensus mechanism", "their incentive structures", "and the maintenance of the integrity of [the] DLT". At the same time, the framework seeks to ensure consistency, coherence, and comparability of sustainability disclosures across crypto-assets.

The regulation does not prescribe a single calculation model. Instead, it defines the indicators to be disclosed and requires that assumptions, estimation techniques, and data sources be clearly described.

The Interpretative Challenge

The reference to sustainability indicators “of the consensus mechanism” leaves open an important question of scope.

Could this mean that sustainability reporting can be limited to generic network-level metrics? Or does it require some form of attribution to the specific crypto-asset being offered or admitted to trading?

If interpreted narrowly, tokens built on the same distributed ledger would disclose identical energy consumption, greenhouse gas emissions, and related indicators, regardless of:

- Their relative transaction volumes
- Their contribution to network activity
- The allocation methodology used to derive intensity metrics
- The presence of additional validation or scaling layers

Such an approach may formally reference the consensus mechanism, yet it does not distinguish between assets that rely on the same infrastructure in materially different ways. The result is a disclosure framework where multiple crypto-assets present identical environmental data, even where their operational footprints differ.

Interpreting the Regulation in Context

While one may initially assume that sustainability disclosures should be limited to network-level metrics, this is not the industry-standard interpretation.

Legal interpretation techniques require considering not only the literal wording of a provision but also the intent of the regulator and the broader regulatory context in which the rule was adopted. MiCA's sustainability requirements emerged from a political debate over the environmental impact of Bitcoin, whose proof-of-work consensus mechanism has long been associated with high energy consumption. Rather than banning Bitcoin, as was originally proposed, policymakers ultimately settled on requiring sustainability metrics for each asset.

The specific wording used in MiCA refers to the "impacts of the consensus mechanism used to **issue** the crypto-asset". In practice, however, consensus mechanisms are generally independent of asset issuance. In Bitcoin's case, consensus currently results in new bitcoin issuance through block rewards, but this mechanism is scheduled to end around the year 2140 while consensus itself will continue. For most other crypto-assets, asset issuance does not emerge from consensus at all, as many tokens are pre-minted. While this technical nuance was not central to the policymaking debate, it should not be used as a loophole to avoid the intent of the regulation.

Limits of a Purely Literal Interpretation

A purely literal interpretation could therefore lead to implausible outcomes. For example, it would be incorrect to report zero energy consumption for XRP simply because XRP is not issued through consensus. Similarly, if Bitcoin were to reach its maximum supply of 21 million (scheduled for 2140), the energy consumption of its proof-of-work consensus mechanism would persist and should be reported under MiCA, rather than omitted simply because no further issuance occurs. Moreover, it would also be incorrect to discount 95% of Ethereum's energy usage on the basis that only a portion of node activity is strictly related to consensus. Much of a node's energy use derives from baseline hardware operation (motherboard, RAM and storage) and other components of the protocol stack, including the Ethereum Execution Layer. This becomes clearer when reading recital 1 of CDR 2025/422:

> **"Transactions relating to crypto-assets, including their issuance, are validated and recorded via consensus mechanisms, namely the rules and procedures to reach an agreement on the validation of a transaction among distributed ledger technology (DLT) network nodes, which are also responsible for holding records of all transactions on a distributed ledger. The achievement of consensus, which requires the use of materials and computing power, comes with impacts on the climate and environment, which differ across DLTs depending on their specific features."**

What CDR 2025/422 Clarifies

This recital makes clear that the regulators are concerned with the environmental impact of transactions in general, and that issuance transactions in particular are only a subtype within that broader category. Both issuance transactions and other transactions are therefore included within the scope of sustainability disclosures.

Recital 8 further clarifies this point and deserves special attention:

> **"To assess the impact of the consensus mechanism used to issue each crypto-asset on the climate and other environment-related impacts, it is appropriate to take into account both the validation of each transaction in the relevant crypto-asset, taking into account the DLT network nodes actively involved in the validation, and the maintenance of the integrity of a DLT by all DLT network nodes."**

A key concept in this excerpt is "each crypto-asset". Sustainability disclosures must be specific to each crypto-asset, which strongly implies they must be unique. In that same vein, both website ESG disclosures and white papers are clearly asset-level. It follows that the environmental metrics contained in those disclosures must also be asset-level.

Consider a simple example: if an exchange lists 90 Solana tokens and prepares a seven-page disclosures for each asset, the resulting 630 pages of disclosures cannot simply repeat identical network-level data. It is therefore clear that asset-level disclosure reflects both the intent of the legislator and the outcome of a systematic reading of the regulation: measurements may begin at the level of the consensus mechanism, but the final outputs must be presented at the level of the crypto-asset.

In conclusion, regulators clearly intended to obtain the energy consumption of individual crypto-assets and to enable meaningful comparison between them. Correct legal interpretation recognises this objective, rather than attempting to rely on literal readings of the text to produce formally compliant but substantively empty disclosures. Such approaches entail legal risk and may position the regulated firm as acting in bad faith toward the regulator.

From Legal Interpretation to Implementation

The interpretation above clarifies that sustainability disclosures under MiCA must ultimately be presented at the level of the crypto-asset. This raises a practical question: how should the environmental impacts of distributed ledger validation be attributed to individual assets?

The latest version of the MiCA Crypto Alliance Methodologies for Standardised Sustainability Reporting addresses this challenge by applying a structured attribution approach to the impacts associated with transaction validation. The methodology follows the framework established in CDR 2025/422, which identifies electricity consumption as the primary proxy for the energy footprint of distributed ledger networks.

In practice, this involves allocating energy consumption and related environmental indicators to individual crypto-assets based on their activity within the network.

The methodology includes, for example:

- Calculating electricity consumption using node-level or hash-level data depending on the consensus model
- Attributing energy consumption proportionally to a crypto-asset's transaction activity where relevant
- Deriving greenhouse gas emissions from electricity consumption using location-based grid factors
- Computing intensity metrics per validated transaction
- Estimating hardware-related waste through device lifecycle analysis
- Calculating water consumption based on the energy sources used in electricity generation

For Layer-2 tokens, the methodology applies a hybrid attribution approach that allocates a share of Layer-1 energy consumption based on transaction activity, gas usage, and infrastructural dependencies between the Layer-2 system and the underlying network.

This structured approach allows sustainability indicators to remain grounded in the impacts of the consensus mechanism while producing disclosures that are specific to each crypto-asset.

Under CDR 2025/422, sustainability disclosures must also describe the sources, assumptions, and estimation techniques used to derive the indicators. Methodological transparency is therefore an integral part of the disclosure framework, ensuring that sustainability metrics are not only reported but can also be understood and evaluated.

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MiCA Crypto Alliance

The MiCA Crypto Alliance is a leading collaborative initiative simplifying regulatory compliance across the crypto industry. We provide verified sustainability data and write MiCA-compliant white papers to help token issuers, CASPs and crypto projects meet their disclosure obligations under MiCA.

This Alliance focuses on standardising compliance efforts among its members, offering exclusive resources like sustainability indicators and white paper elaboration tools tailored to meet MiCA requirements. By leveraging the collective expertise of its members, the MiCA Crypto Alliance will help reduce the complexities and costs associated with compliance, while setting a high standard for transparency, market integrity, and consumer protection. For more information on joining the MiCA Crypto Alliance, please see the details below.

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