Response to the Second Consultation on the Technical Standards specifying certain requirements of Markets in Crypto Assets Regulation (MiCA)

Response to Q6: Do you agree with ESMA's description on the practical approach to assessing the sustainability impacts of consensus mechanisms? If not, what alternative approach would you consider suitable to assess these impacts?

I agree with ESMA's practical approach to assessing the sustainability impacts of consensus mechanisms, but I think that the sustainability disclosures requested by ESMA are incomplete.

In the spirit of practicality and accuracy, to obtain a complete picture of the energy and emission system balance relating to crytpoassets it's advisable to add a "Favourable sustainability indicator" section to the "Adverse sustainability indicators" in ESMA's templates.

I am aware that carbon offsets "*shall not be taken into account when computing the metrics*". I think in this respect ESMA refers to traditional offsets, i.e., indirect actions like buying CO2 offsets and renewable energy credits, planting trees, etc.

The favourable sustainability indicators I am referring to are built-in within some of the use cases of the Proof-of-Work (PoW) consensus mechanism used by some crytpoassets. In other words, these indicators refer to roles that are consubstantial with PoW's technical characteristics and that make direct, immediate, positive sustainability contributions.

Examples include demand response and grid balancing services for Transmission System Operators (TSOs) and Distribution System Operators (DSOs) in the power sector; behind-the-meter co-location with solar and wind power developers, cutting the cost of renewable energy deployment and its Levelized Cost of Energy (LCOE) by providing a source of revenue as solar and wind parks wait for long grid-connection cues; decreasing renewable energy generation curtailment of grid-connected wind and solar parks when demand is insufficient to absorb the supply of power and storage systems are not available; power methane venting and flaring mitigation; landfill methane mitigation; heat recycling covering thermal energy consumption by distilleries, greenhouses and other low-heat commercial and industrial users.

All these use cases and others are made possible by PoW's extreme operational flexibility, location agnosticism and scalability up and down the power range, as well as in-front and behind-the-meter. The installed power of renewable energies, the energy affordability and efficiency per euro invested and the mitigation of CO2 and methane emissions can all directly benefit from PoW's built-in actions within the system configurations such as the ones mentioned above.

It is possible to find here a more detailed and exhaustive treatment of the positive contributions that the PoW consensus mechanism offers, as well as more background material on an a more accurate characterization of PoW.

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Response to Q8: ***In your view, are the proposed mandatory sustainability indicators conducive to investor awareness? If not, what additional or alternative indicators would you consider relevant?***

In my opinion, the proposed mandatory sustainability indicators allow only a partial and skewed awareness among investors. To foster a more wholesome and accurate level of awareness among investors and the financial community at large it is crucial to include the "favourable sustainability indicators" exemplified in my response to Q6, which are built in within many PoW use cases.

Examples of favourable sustainability indicators may include:

Climate and other environment-related indicators				
1	2	3	4	5
	Favourable sustainability indicator	**Metric**	**Source of information, review by third parties, use of data providers or external experts**	**Methodology to calculate metrics from information and data obtained**
Energy	Renewable energy generated behind the meter	Total amount of energy that the maintenance of the integrity of the distributed ledger of transactions allowed to generate, expressed in megawatt-hours (MWh) per calendar year		
	Renewable energy generated in front of the meter	Total amount of energy that the maintenance of the integrity of the distributed ledger of transactions allowed to generate, and that prevented curtailments and consumption from other sources, expressed in MWh per calendar year		
	Reduction of renewable energy deployment costs	Total contributions made within the maintenance of the integrity of the distributed ledger of transactions, paid to RES developers for energy they produced while waiting their turn in the grid-connection cue, expressed in €/MWh per calendar year		

	LCOE reduction for renewable energy projects	Estimated contribution made within the maintenance of the integrity of the distributed ledger of transactions for the reduction of LCOE over the lifetime of an energy project, expressed in €/kilowatt-hours (kWh) per calendar year		
	Demand response services	Total contribution to TSOs and DSOs, made within the maintenance of the integrity of the distributed ledger of transactions, for energy CASPs consumed/not consumed to balance the power grid, expressed in megawatt-hours (MWh) per calendar year		
GHG emissions	Avoided CO2e emissions - Scope 1 (Controlled)	Avoided Scope 1 GHG emissions for the maintenance of the integrity of the distributed ledger of transactions, expressed in tonnes (t) carbon dioxide equivalent (CO2e) per calendar year		
	Avoided CO2e emissions - Scope 2 (Purchased)	Avoided Scope 2 GHG emissions for the maintenance of the integrity of the distributed ledger of transactions, expressed in tCO2e per calendar year		

Response to Q38: ***Are there relevant technical attributes describing the characteristics of the cryptoasset or of the DLT on which this is traded, other than those retrievable from the DTIF register? Please detail which ones.***

The technical attributes describing the characteristics of a cryptoasset or its DLT as they are listed in the DTIF register are correct, but insufficient to provide the full scope of the payments occurring within each block of a blockchain. In most DLTs, block ≠ transaction. Each block may contain many thousands of payments, or even more, representing both on-chain and off-chain single flows of money.

This type of cryptoasset and DLT is more similar to a wholesale payments system, where the front end and back end, the processing, clearing and settlement of payments are much more compressed together than in traditional systems.

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It would be appropriate in respect to the different priorities of MiCA if ESMA unpacked this type of architecture by adding a clear reference to such block design to the characteristics listed in the DTIF register. This could be done by adding a "Block Attribute" section to the technical attributes maintained by DTIF.

For instance, for the Bitcoin example used on page 44 of the ESMA's second consultation paper on MiCA, at the end of the template, following "Normative Attributes" and "Fork Attributes" there could be a "Block Attribute" section, featuring elements such as each block's hash and referencing all the hashes of each payment contained in each block.

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Response to Q39: ***Do you agree with using the transaction hash to uniquely identify transactions that are fully or partially executed on-chain in orders and transactions records? Please clarify in your response if this would be applicable for all types of DLT, and also be relevant in cases where hybrid systems are used.***

I agree with using hashes as the key identifier for payments. I do not agree with stopping at using only block hashes to identify transactions. As mentioned to my response to Q38, block ≠ transaction. Each block may contain many thousands of payments, i.e., "transactions", or even more, representing both on-chain and off-chain single flows of money.

Each of the many payments contained in each single block has its own hash, so ESMA's orientation to base its monitoring on hashes can easily widen its gaze by including each single money-flow's hash in the supervision of distributed ledgers.

In other words, as the equation block = transaction is wrong, the ESMA can obtain a much more coherent, complete and accurate record of actual "transactions", i.e., payments, if it included all payment hashes within each block to identify the full scope of wholesale financial flows in the digital world.

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Response to Q41: ***Do you agree with the inclusion of the above data elements, specific for on-chain transactions, in both RTS?***

I agree with the inclusion of the data elements listed in the table shown in the paper, but I urge ESMA to add another field featuring a key on-chain data point, which is the hash of each single payment contained in each block. Hashes can also be used to identify the off-chain money flows that will eventually be synthesized into a single payment on chain.

The adoption of hashes is justified also by the choice of sources ESMA has made for the data elements it intends to use. ESMA refers to the Malta Financial Service Authority (MFSA) and its Live Audit Log Guidelines as the source of some on-chain data elements which aims to follow.

In its "Subsection 2 – On-Chain Data", the MFSA explicitly lists hashes as one of the data to be included in financial reporting. The ESMA could add the following row to its proposed table:

Field name	**Type**	**Description**	**Valid values**
TXID	String	Transaction ID/Payment Hash	

In this respect, it is important for ESMA to note that hashes should include the hashes of all payments contained in each single block, not just the block's hash.

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Response to Q44: ***Please suggest additional data elements that may be included to properly account for on-chain trading.***

In order to have the full scope of both on-chain and off-chain trading and activities it is vital to include the hashes of each single payment contained in each block. Transaction ≠ block. One single block usually contains many thousands of transactions, whose significance would be missed if only block's hashes were included in the count.