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2023

FACT SHEET

Polymesh

Electricity Consumption
and Carbon Footprint

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Polymesh: Electricity Consumption and Carbon Footprint
(all metrics as of November 28, 2022)

*The analyses underlying this factsheet are commissioned by **Polymesh Association**.*

KEY NETWORK METRICS

Name	Polymesh
Symbol	POLYX
Consensus mechanism	Proof of Stake
Network type	Layer 1
Validator count	39
24h-analysis-period transaction count	110
Annualized transaction count	40,150

KEY ELECTRICITY METRICS

Average electrical power per node [W]	12.62[1]
Electrical power of network [W]	492.18
Annualized electricity consumption [kWh]	4,312.01
Marginal electricity consumption per tx [Ws]	N/A[2]

KEY CARBON METRICS

Annualized CO_2 emissions [t]	1.98
Marginal CO_2 emissions per tx [kg]	N/A[2]
Applied CO_2 emission intensity [g/kWh]	459 (world CO_2 emission intensity)[3]

[1] Value for a representative node assuming the node distribution among hardware configurations as shown in the Appendix.
[2] The number of transactions that were executed during our measurement period falls below the threshold required to build a mathematical regression model.
[3] IEA (2022). World Energy Outlook 2022. https://iea.blob.core.windows.net/assets/830fe099-5530-48f2-a7c1-11f35d510983/WorldEnergyOutlook2022.pdf

Appendix

The analyses underlying this factsheet follow the same approach and methodology as outlined in CCRI's methods whitepaper for assessing the electricity consumption and carbon footprint of PoS networks.[4] There are five main steps:

- First, we analyze the network and its minimum hardware requirements and select the hardware that we use to measure a single node's electricity consumption.
- Second, we run a full node on all selected hardware devices and measure their electricity consumption and calculate a best guess estimate based on representative hardware distribution.
- Third, we estimate the electricity consumption of the complete network by scaling the electricity consumption up with the total node count.
- Fourth, we examine the number of transactions handled during the measurement period and derive the marginal electricity consumption per transaction.
- Fifth, we use the world average carbon intensity to translate the network's electricity consumption into a carbon footprint.

HARDWARE-SPECIFIC MEASUREMENT RESULTS

Hardware configuration	1	2	3	4	5	6
CPU	Broadcom BCM2711	Intel i3-8109U	Intel i5-8400T	Intel i5-1135G7	Intel i5-10400	AMD 3970X
Ram	8 GB	8 GB	8 GB	16 GB	64 GB	256 GB
Storage	128 GB SD	512 GB SSD	256 GB SSD	2 TB SSD	2 TB SSD	2 TB SSD
Configurations selected	yes	yes	yes	yes	yes	yes
Mean electrical power in idle [W]	3.039	2.696	2.947	3.656	25.039	78.174
Mean electrical power of node [W]	3.373	4.026	5.207	7.693	28.802	107.374
Assumed node distribution	3.125 %	15.625 %	31.25 %	31.25 %	15.625 %	3.125 %
Measurement period	2022-11-28 15:11 CET to 2022-11-29 15:11 CET					
Software version	v5.1.0 (PC1: v5.1.0-ARM)					

[4] CCRI (2022). Determining the electricity consumption and carbon footprint of Proof-of-Stake networks. https://carbon-ratings.com/dl/whitepaper-pos-methods-2022

About CCRI

CCRI – *Crypto Carbon Ratings Institute* – is a research-driven company providing data on sustainability aspects of cryptocurrencies, blockchain and other technologies. The interdisciplinary team has built a multi-year research track record with a specific focus on cryptocurrencies and their sustainability impacts. CCRI uses the most up-to-date data sources as well as methods based on formerly peer-reviewed studies published in renowned scientific journals. CCRI provides insights that help their clients to understand and manage crypto-related ESG exposure. They serve a broad range of clients including institutional investors, exchanges and blockchain networks.