sapphic-cafe.neocities.org

Ethereum's greenwashing with outdated data

Ethereum, being the 2nd most valued blockchain network in the world[1] got big claims about reducing network footprint by 99.998%(!) after Proof-of-Stake hard fork[2] called *Ethereum 2.0*. You might ask, what's the problem? It's simple - the data is outdated.

Informations about greatly decreased environmental impact are still on the Ethereum foundation's page[3], but the data is from 2022[4]. It's more than 2 years old and since then many things changed. The report was made just after hard fork, still when not so many miners switched from PoW to PoS and because of this the report calculates carbon footprint assuming network has just 4,755 nodes, while now it has more than 970,000[5] nodes! Let's do quick math right now:

The 2022 sustainability report prepared by CCRI the carbon footprint of Ethereum PoW network was 11,016,000,000 kg per year (a lot!), while the footprint of Ethereum 2.0 with 4,755 nodes was 869,780 kg per year (quite impressive improvement, but heck, it's still big, isn't it?) which using simple formula (emission/node count = emission per node) gives us following result:

~182,92 kg of co2 per node per year

Now let's multiply it by current amount of nodes in the network which is 979,616[6]:
~179 191 358,72 kg of co2 per year for the whole Ethereum 2.0 network, which gives us not the exceptional 99.998 percent reduction, but rather 98,3734 percent, which might seem like insignificant difference, but it's increase in carbon footprint by more than 2 000x (200 000%) comparing to initial Ethereum 2.0 network state.

The difference of 179 190 488,94 kg of co2 per year vs initial state can be compared to an additional 1 million cars driving 448 miles (~720 kilometers) each year[7]. It should be enough to highlight the enormous differences between each percent of carbon emissions generated by Ethereum blockchain. Anyways, would you miss 1 million cars?

While it's significantly better than Proof-of-Stake there is plenty room for improvement. In my personal opinion such energy waste just to power distributed network capable of as little as 12 transactions per second[8] is embarrassing.

sapphic-cafe.neocities.org

[1] ethereum on coinmarketcap (archived 28-03-2024)

[2] energy consumption data on ethereum foundation's website (archived 28-03-2024)

[3] energy consumption data on ethereum foundation's website (archived 28-03-2024)

[4] CCRI ethereum report (archived 02-02-2024)

[5] validator nodes count on ethereum foundation's website (archived 28-03-2024)

[6] validator nodes count on ethereum foundation's website (archived 28-03-2024)

[7] Tailpipe Greenhouse Gas Emissions from a Typical Passenger Vehicle (pdf)

[8] I am excluding layer 2 from total throughput, because running layer 2 requires additional nodes for maintaining the state of additional small blockchain running on top of the Ethereum network. Here's the example from zksync network (archived 28-03-2024)