Concordium Transaction Fees

Concordium is a Blockchain for Business. Businesses need to be able to predict costs in advance. We are bringing predictability of transaction costs for the first time to a Public, Permission- less chain. Trust is key to Concordium, and we want our users to have predictability and confidence in the costs of using the network.

Yet key to operating a secure public blockchain network is ensuring that 'Bakers' who secure the network are sufficiently incentivised to run the network.

The basic operating costs of the network should be supported by transaction fees, even if GTU prices are not rising. In this way, it will always be financially feasible to attract sufficient validation capacity on the network and at the same time, Bakers can enjoy the long-term perspectives of an investment in GTU.

Balancing the equation

We have three interests to balance

1. Needs of business and their users.
2. Security, reliability and speed of the network via the validation process
3. Financial rewards for Bakers/Stakers

Addressing Needs of business and users

As the only public, permissionless network, Concordium addresses the need of business for dependable pricing by means of a stabilized transaction price mechanism that isolates the Euro price of transacting on the network from significant fluctuations in the on-chain transaction currency – the GTU.
We also offer that the price per transaction in Euro falls over time reflecting underlying cost advantages. This is a unique benefit of Concordium and plays to the demands of business.

We do this via two mechanisms

1. We have set the price of a transaction to 1 Eurocent from launch until the end of year 2. After this, the price will decrease to EUR 0.009 when the number of transactions per minute exceeds 1,000 on average for more than 60 consecutive days, and it shall decrease to EUR 0.008 when the number of transactions per minute exceeds 2,000 on average for more than 60 consecutive days. Thereafter it shall decrease by EUR 0.001 every time the average of transactions per minute exceeds a new threshold of +500 transactions per minute on average for more than 60 consecutive days until it reaches EUR 0.003, when the Governance Committee shall propose a new pricing schedule.

2. Price stability mechanism, known as Energy. Concordium uses GTU as the on-chain transactional unit. The price of the GTU will vary according to demand on the exchanges, and events in the crypto eco-system. To isolate the transaction fee from swings in GTU, we build in a stability factor, called Energy. As GTU prices change, Energy will be adjusted. The mechanism behind Energy is described in the **White Paper**. Energy will be adjusted constantly via an Oracle connected to pricing sources.

Addressing Financial rewards for Bakers/Stakers

Running a baking node needs to be financially attractive. There are many reasons why individuals may choose to run a node but we believe that the base costs of operating a node should be covered by the people using the network – Users (who are making transactions on the network or simply holding GTUs) are deriving value from the network and it is fair that the costs of running and supporting a validation mechanism can be supported by transaction fees and new minting.

Concordium has defined a minimum of 30 nodes to assure an adequate level of safety. . A total operating cost of minimum 30 validator nodes approximates to EUR 70.000 per year, based on commodity hardware and domestic electricity prices. Using more powerful computers will not increase Baking Rewards, so these costs actually fall with time.

After the 10% Foundation tax, validators will (given no delegation) receive 90% of the transaction fees, (EUR 0.009), so the EUR 70.000 cost will be recuperated in so far as there are 70.000/0.009 = 7,77 million transactions annually, or an average of approx. 14 Transactions per minute. Even if such low transaction level is not achieved the Bakers are receiving rewards from minting and thereby securing an adequate incentive for Bakers to uphold the safety of the network.

Addressing Security, Reliability and Speed

TPS	1,0	5,0	10,0	15,0	20,0	25,0	30,0	33,3	40,0	45,0	50,0
ROI	10,89%	6,09%	6,80%	6,44%	5,79%	6,43%	7,07%	5,95%	6,71%	6,64%	7,14%

Baker Return as a function of Transactions Per Second (TPS) on Concordium at 30% delegated stake and 10% not staked or delegated

Some capacity restrained Blockchain uses transaction costs to prioritize transactions. Concordium network is designed with initial high capacity and to be sharded, assuring a practically unlimited network capacity, with sub-linear increase in cost. This further assures that low transaction fees can be maintained despite network load.

Any network is also subject to misuse and spam, malicious or accidental. Our transaction cost provides a back stop for this.

Users who are accidentally spamming will eventually run out of funds, whilst the cost of malicious spamming will make this unattractive for the majority of cases.