# ECO: A Global Currency Protocol

Design Proposal

March 1, 2018

## Overview

Eco is designing a global currency protocol, an open source platform that is not controlled by any single individual, organization or nation. Eco aims to create a verified network of global universities and reputable organizations to help design, build and operate an evenly distributed and cooperative financial infrastructure.

The Eco Foundation will oversee design and implementation of the protocol, creating a new distributed payment platform with collective incentives for optimal energy efficiency. Eco seeks to create the most usable digital currency platform to date, offering users an alternative to bitcoin, gold and fiat currency at Eco.com.

## Motivation

The rise of virtual currency represents a radical transformation of how people store and transfer value. It took less than ten years for cryptocurrencies to become popular, compared to hundreds of years for paper money. Currently, only 8% of money globally exists in physical form; the vast majority of money is simply a digital balance, a ledger in a bank computer system. What people consider to be money is often simply an IOU, a virtual unit of account in a system over which they have little control. Within ten years, most people will own a smartphone that can become their personal interface to the financial world, distributing financial control to a far greater degree than today. New payment systems are needed that are not controlled by a central institution, and that provide better user experiences using mobile devices.

Mainstream adoption of existing cryptocurrencies is held back by issues related to complexity, usability and scalability. In order for blockchain and digital currency technologies to become mainstream and scale while preserving a decentralized design, new platforms are needed that are easier to use. Future digital currency protocols that seek to scale to billions of users must offer the stability of an asset like gold or USD within simple mobile interfaces.

## History

Bitcoin, the most popular digital currency as of early 2018, has succeeded thus far due to its elegant and innovative design. Bitcoin was designed to be a p2p payment system, but has trended towards a platform resembling digital gold, with value that cannot be diluted by a single institution. Bitcoin is now held by millions of users, but often treated as a speculative investment rather than used as a medium-of-exchange.

Three issues with Bitcoin are the concentration of resources in the hands of a few, the large amount of energy consumed by the system, and its perception as a complex and unsafe platform. Bitcoin does create a digital asset in the form of scarce digital coins that have a shared perception of value. However, the emergence of large mining pools has led to uncertainty around long-term governance, and a small number of entities now control mining capacity. Future digital currencies should be more evenly distributed, broadly allocated and energy efficient.

## The Eco Protocol

Eco's mission is to create an open, verified and distributed platform for value exchange, a global currency protocol that enables a payment system that is easier, safer, and faster to use than paper money. In addition, Eco will ensure that the majority of the economic value generated by the platform is fairly distributed to the community through accounts created at Eco.com, to create a more balanced distribution of resources.

Eco seeks to address three issues within digital currencies: verification of network nodes, usability of applications, and efficiency of transactions. Eco makes significant improvements by 1) forming a verified network, where universities run nodes, 2) increasing overall token supply, and creating simple web and mobile apps, and 3) designing a system with more energy-efficient and coordinated token generation, to reduce overall power consumption.

## Verified Nodes

The Bitcoin network assumes nodes cannot be trusted, since any node can join the network at any time. In contrast, payment platforms such as credit card networks rely on a single trusted party to clear transactions, and require trust of all nodes. Eco targets a different approach, where distributed nodes are run by verified organizations with a collective incentive to maintain the network. The Eco network will focus on partnerships with universities to build the Eco platform, leveraging the broad expertise found within academic institutions.

The Eco protocol is designed to create and maintain an evenly decentralized network. The Eco Foundation will verify the identity of the initial nodes to help bootstrap the network across a broad geographic distribution. The network will initially accept approximately a few hundred nodes, targeting universities across 50+ nations. This group can then expand to more organizations based on transparent nomination and acceptance (for example by 80% of verified nodes) until most geographies have several operational nodes.

## Efficiency

Bitcoin mining is a very energy intensive process due to the design of the protocol. Bitcoin's worker-lottery approach to distributing new tokens was designed to make it economically costly for any single participant to take control of the network. As hash rate has increased, the Proof-of-Work algorithm has grown to consume large amounts of electricity, and a small number of entities now control the majority of mining power.

Eco will avoid mining by unknown parties, and have verified nodes distribute block rewards to other nodes and users. Instead of a node keeping all of the block reward, the majority will be immediately distributed to all other verified nodes and qualified users, to remove any financial incentive to game the system. Since the network will grow in a gradual manner to only elected, verified organizations, network hash rate can be kept consistent across cooperating nodes. This will enable Eco to consume much less electricity while maintaining integrity of the system, since computational effort creates collective benefit across the network.

## Incentives

The Eco network operates based on collective incentive, rather than individual reward. When a block is successfully mined, tokens are evenly distributed to all other nodes immediately. The financial motivation to increase hashing power is removed, since reward is distributed to all other nodes. The motivation for the node operator becomes to provide just enough hash power to verify that transactions are valid within a collectively agreed upon level of maximum latency. Thus the platform becomes collectively motivated to achieve optimal energy efficiency.

Each node will have visibility into all other nodes using a block-explorer and system stats accessible at Eco.com/node/name, and lazy nodes that do not meet the agreed upon service requirements can be removed from the pool of nodes eligible for receiving rewards. Additionally, since all nodes have aligned incentives the protocol will encourage cooperation and collaboration when making decisions.

## Usability

Usability is critical to the adoption of a new technology platform. Eco seeks to set a new standard in terms of comprehension, brand perception and interaction design to provide the best possible user experience. Many cryptocurrencies developed to date have been primarily technology projects, written by developers for developers, and have not prioritized the usability and understandability of their systems. The perceived complexity and risk of using most platforms limits mainstream adoption, and simplicity is not a core value of most projects.

Eco aims to reach the simplicity and ubiquity of a system such as mPesa within Kenya, but with global availability. Eco will prioritize simplicity and ease-of-use in all design decisions, to help accelerate platform adoption and network effects. Eco.com will enable users to create verified accounts, and profiles such as Eco.com/alice or Eco.com/bob will be formed to enable usage such as "send 3 eco to bob" via interfaces like texting or voice command. The Eco Foundation plans to invest in community projects and applications, which will be available at Eco.com/apps. Grants will initially be overseen by a Platform Committee appointed by the Foundation board of directors.

## Scalability

Eco will start with larger blocksizes and shorter blocktimes than Bitcoin, enabled by a fast network of servers. Targeting an initial confirmation time of less than 1 minute, Eco will enable fast transactions with low fees. Our goal is an initial transactional capacity of approximately 1000 transactions per second, facilitating a faster payment network for use-cases like remittance and wire transfers. Within a few years, Eco aims to achieve capacity of 100,000+ transactions per second by using Transaction Sharding, where transactions are directed to specific shards for acceptance and validation, instead of the whole network validating the same transaction. Transaction sharding will combine principles of decentralization, identity attestation, trust and reputation within a system of verified nodes that establish and maintain the network.

## Token Allocation

Beyond creating a resilient open financial system, Eco seeks to reduce the inequality that currently exists in the distribution of digital currency. Eco plans to algorithmically allocate tokens to its community over several years, ensuring that value created is distributed fairly over time.

Eco plans to distribute 50% of the token supply to the first 1 billion unique, verified human users on the platform (with equitable demographic and geographic representation) to allocate value created to a large community of users. 20% will be allocated to verified nodes (partner universities) and their network

of researchers and developers. 10% will be held by the Eco Foundation to fund operations and community grants, and 10% to active contributors and advisors. The remaining 10% will be allocated to strategic partners worldwide.

If properly executed, this token allocation strategy will accelerate platform adoption and network effects, and help achieve a gradual reduction of economic inequality across the globe. Instead of rewarding anonymous miners, Eco will give the majority of its value created to billions of users around the world. This can help more than two billion people in developing nations gain improved access to financial services, and achieve a more balanced distribution of resources.

## Monetary Policy

Eco aims to become a medium-of-exchange as well as a store-of-value, with sufficient token supply to provide good system usability. Instead of fixing monetary supply to an arbitrary level, Eco aims to increase the token supply gradually in proportion to its market capitalization, to help maintain reasonable token prices by increasing supply incrementally. In order to enable billions of users to eventually own many Eco tokens each, an initial supply of 1 trillion tokens will be generated over several years. This will enable a future user to have hundreds of Eco in their account, instead of a very small fraction of a more scarce token. For example, future user would find it much easier to pay 1.25-eco for something than 0.000000125-btc.

One Eco token will be divisible into 100 parts, to mimic the familiar concepts of dollars and cents. This will increase overall system usability, by reducing the cognitive load of dealing with very small fractions. Further research is needed into the best mechanism for algorithmic distribution of new tokens, but in principle half of tokens created should be given to unique, verified human users over a period of several years.

If new tokens are issued in the future beyond the supply of 1 trillion, Eco seeks to maintain the policy of distributing 50% to end-users, in a fair algorithmic manner. With an algorithm designed to minimize volatility, Eco should eventually reach sufficient price stability to function as a daily-use currency. This would eventually enable Eco to function as both a medium-of-exchange and a store-of-value.

## Governance

Technology will improve over time, and Eco systems will be upgraded as they scale. Eco will collaborate with a broad group of experts to ensure continuous improvements are made in a timely manner based on community feedback. Initially, a diverse board of directors will design Version 1.0 of the protocol, and

invite a network of verified nodes to run the software. New directors may be approved by majority vote of existing directors, and will rotate every few years based on expertise needed during the next phase of growth.

The Eco Foundation will initially use off-chain governance processes currently employed by large public organizations, to ensure a team of experts can iterate on system design with public oversight. The directors will set up special committees of expert contributors, with the most knowledgeable foundation director as committee chair. These committee chairs will coordinate collaboration in the Eco Forum, for design planning and policy discussions. Independent audit committees will be elected by the foundation directors, who will have full transparency into the systems of all network nodes, and report all findings to the public.

Eco will take an empirical approach to governance, iterating over time to become more decentralized and more robust as system adoption increases. As Eco becomes more popular, governance processes will migrate into the protocol itself, using weighted-reputation voting mechanisms to achieve full system self-governance within a few years. Progressive decentralization will allow new ideas to be tested and verified before being widely distributed, and will allow Eco to gradually achieve the topology of a global mesh network.

## The Eco Foundation

The Eco Foundation is an independent, non-profit organization creating an open-source, decentralized financial system. The mission of the Eco Foundation is to develop a global currency protocol that is evenly distributed and extremely robust. Eco was created with the belief that effective digital currencies have the potential to give greater financial control and independence to billions of people. The Eco foundation will guide the development of the Eco protocol, with transparent governance and continual improvement.

Eco is in the early stages of system design, and aims to collaborate with researchers and developers worldwide. If you are an expert in technology, security, economics, governance, policy or design and are interested in helping build Eco into a global currency, please email us at contributors@eco.com. Universities, open-source projects, companies and non-profits who are interested in partnering with Eco can email partners@eco.com for more information. If you have feedback on Eco, please send ideas and suggestions to feedback@eco.com.