

THE ECO COIN

A CRYPTOCURRENCY BACKED BY SUSTAINABLE ASSETS

WHITE PAPER V1.0



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Content

01 Abstract	3
02 Motivation	3
03 The ECO coin	4
What is an ECO coin?.....	4
What sustainable actions can I earn ECOs with?	4
How are sustainable actions verified?.....	5
What can I spend ECOs on?	5
How else can I get ECOs?	5
How many ECOs are there?	5
04 A Sustainable Marketplace	6
What does this new sustainable marketplace look like?	6
How does the marketplace work?.....	6
What are the use cases?	7
What are the advantages of being part of the marketplace?.....	7
05 Backed by Sustainable Assets	8
Why back the ECO coin?	8
Why use trees as the backing?.....	8
How will this practically work?	8
How do we guarantee that every ECO coin is backed?.....	8
06 A Living Coin	9
What happens when a tree dies?.....	9
How are trees of different sizes valued?.....	9
How does a living coin work?.....	9
Will new coins be generated if old coins decay?.....	9
07 A Democratic Community	10
How will the ECO coin be a sustainable blockchain?.....	10
What are ECO nodes?	10
What is a decentralised autonomous charity?	10
Who can vote?	10
08 Roadmap	11
09 Team and Partners	12
Team.....	12
Partners.....	12
10 Acknowledgements	12
11 Contact	12

01 Abstract

When you cut a tree and sell the wood, you will earn money. When you plant a tree, you are creating value, but you won't get paid. Ecological value is not well articulated in our economy. The ECO coin aims to fix this. It is a new cryptocurrency that positively rewards people with ECOs for their sustainable actions. It is also the first cryptocurrency to be backed by sustainable assets; every ECO coin is backed by one tree. As more ecological assets are added to the system, more ECO coins become available. This also makes the ECO coin a living currency. Just as our ecology cycles through growth and decay, so too do ECO coins. ECOs coins are born, live and decay over time. The currency is governed by a Decentralised Autonomous Charity (DAC) so that not one organisation, but all those who use it have a voice in its development. Sustainable actions are verified by the crowd, through smart IOT integration and by certified vendors.

02 Motivation

For decades, economists have argued that prosperity requires growth, with environmental damage as the regrettable but unavoidable consequence. Our environment is often seen as an external cost, or a business externality. A negative externality is the creation of air pollution through burning fossil fuels. A positive externality on the other hand is carbon sequestration by trees. These externalities are not well articulated in our current economic outlook. We do not see the enormous value that is all around us. Efforts to include our ecology into our economy often fall short.

For example, Ecosystem Services¹ is a framework built upon the idea of "natural capital" whereby every service provided by our environment is given an economic value in euros and cents. However there has been strong resistance to this commodification and price tagging of nature. How do you work out the value of an inspiring walk through the forest or the sound of birds tweeting? We know that nature is valuable but should we be giving it an economic value in such a direct way? What are the consequences of such an idea? There is a danger that the price of the ecosystem will be superseded and so replaced: the lake is worth €10 million, but if we replace

the lake with a road that has a value of €11 million then goodbye lake, fish, insects, biodiversity and biosphere.

Emissions trading², another idea to protect the environment, is a way to cap and trade pollution with the goal to reduce the amount of emissions in the coming year. The idea has good intentions but at best can be bureaucratic and slow to enforce and at worst simply moves the problem elsewhere. Both these solutions are top down and designed in a way to limit damage. They are constructed to negatively reinforce people to do less bad. But what if we flipped that idea on its head and instead positively incentivised people to do more good? If you can make money from cutting down a tree why can't you make money planting one?

There are many ways in which we can incentivise behaviour, probably the most powerful and ubiquitous is money. Our fiat currencies, such as pounds, euros and dollars, incentivise billions of people around the world every day. It seems then only logical that we should design a new currency to both value and reward ecological action. We call it the ECO coin.

1. <https://biodiversity.europa.eu/topics/ecosystem-services>
2. https://ec.europa.eu/clima/policies/ets_en

03 The ECO coin

What is the ECO coin?

The ECO coin is a new cryptocurrency that is earned through sustainable action. The ECO coin aims to reward anyone, anywhere in the world carrying out sustainable actions. Eating meat-free meals, switching to a green energy provider or riding a bike to work can earn you ECOs which you can spend in our new sustainable marketplace to buy ecological experiences, services and goods.

ECO coins are stored in special digital wallets accessible through a web browser at first then through a mobile app. A digital wallet can do much more than a physical wallet as it can receive ECOs, store them and send them to other digital wallets. Wallets can also display information about what sustainable actions can be carried out and where the currency can be spent.

What sustainable actions can I earn ECO coins with?

There will be a variety of sustainable actions that people can receive ECO coins for carrying out. As time goes on, the community, that is those who use the currency, can add more actions to the system to expand the pool of sustainable actions possible. Of course not all sustainable actions require the same amount of time, energy or have the same impact. This means that different actions will have different amounts of ECO coins available. See table

Example Sustainable Actions

Actions carried out	ECOs Received
Buy a meat free lunch	0.50E
Ride a bike for to work (1km+)	1.00E
Turn the heating down (below neighbourhood average)	3.50E
Switch to a green energy provider	10.00E

Over time as sustainable actions become the “new normal” the amount of ECOs received for the actions will go down. Dynamic pricing will also be used so that prices can vary from one location to another. For example, in the Netherlands it’s very normal to bike to work. However in Portugal bikes are used much less often³. So someone biking in Portugal earns more ECOs than someone biking in the Netherlands.

How are sustainable actions verified?

It’s extremely important that actions are verified, otherwise it becomes too easy for bad actors to game the system. There are currently three ways in which sustainable verification can take place:

1. Sensor Integration - Here we look to use the sensors that are already around us. As we move closer to a world in which we are surrounded by smart sensors that can record our daily activities, we can tap into this and use it to verify sustainable actions. Take the example of a smart thermostat. It can record exactly when the thermostat is adjusted during the day and can even know who is in

the room at the time. With this information, people in the room can automatically receive ECOS when the temperature is lowered a few degrees below average for that neighbourhood. The ECO coin can integrate many smart systems through API protocols so that we can capture actions relating to transportation, energy usage and waste flow to name a few.

2. ECO Inspectors - The role of a cryptocurrency miner is to verify transactions and so secure the network using specialised, energy intensive machines⁴. For their service in verifying transactions, miners are rewarded in the cryptocurrency. In the ECO coin system, we see a new role: the ECO inspector who verifies that sustainable actions are carried out. For this work, they are rewarded with a small amount of ECO coins per verification. For example, think of a security guard monitoring a place of work. They can see what goes on and can supplement their income by becoming an ECO inspector, making sure people arrive to the office by bike, grab a meat free lunch or recycle their paper.

3. <https://ecf.com/sites/ecf.com/files/CONEBI%20market%20report%20analysis%202016.pdf>

4. <https://digiconomist.net/bitcoin-energy-consumption>

3. Certified Vendors - Many vendors will be able to include the ECO coin into their digital systems and webshops. For example when you order a green product on Amazon and get it shipped to you at a slower speed this action is more sustainable than getting it delivered the next day. This information can be easily shared so that the purchaser automatically receives ECOs. This can also happen in real life. A vendor is certified when their business has been examined and passes certain sustainable standards. They can then give ECOs for purchasing certain products and can accept them as (part) payment for their goods. This can be managed by the vendor and be verified through purchase receipts if an audit is carried out.

What can I spend ECOs on?

The aim is to both earn in a green way and also spend in a green way. It's best to prioritise then services and experiences over products. When products are purchasable with ECOs, the more circular by design they are the better.

Examples of how ECOs can be spent

Experience / service / product	ECOs Price
Ticket to the cinema	12.50E
Entrance to a secret bar and club	20.00E
30 minutes of bike repair	45.00E
50% of a Tesla Roadster	100,000E

How else can I get ECOs?

We have already talked about earning ECOs for carrying out sustainable actions and for verifying actions. There are other ways in which you can get an ECO coin, each a sustainable action in its own right.

1. Earning The easiest way to get an ECO coin is to earn it by carrying out a sustainable action.

2. Verifying ECO inspectors can earn ECOs by verifying actions have taken place

3. Buying ECOs will be sold for fiat money as part of our Initial Coin offering (ICO).

4. Backing ECOs can also be exchanged for ecological assets. If you are a tree owner, for every ten trees placed into the ECO coin system, an ECO coin is earned. (see section 05)

5. Vending Certified vendors that sell sustainable products, or accept ECOs will get a small bonus as being part of the marketplace.

6. Developing There will be a bounty program for helping to develop the technical infrastructure as well as helping to grow the community.

How many ECOs are there?

Many cryptocurrencies have a total supply which means the total amount of that currency that will ever be in circulation. This is written in the code and can not be changed at a later date. For example Bitcoin has a total supply of 21 million⁵ which was set by its creator(s) seemingly at random. Giving a cryptocurrency a total supply creates a finite and scarce digital resource.

What if we could tie the total supply to our finite physical resources? There are currently around three trillion (3,000,000,000,000) trees on the planet⁶. Every ECO coin in circulation will be backed by a tree (more on this in Section 05). It's possible to then conclude that the theoretical total supply of ECOs is 3 trillion.

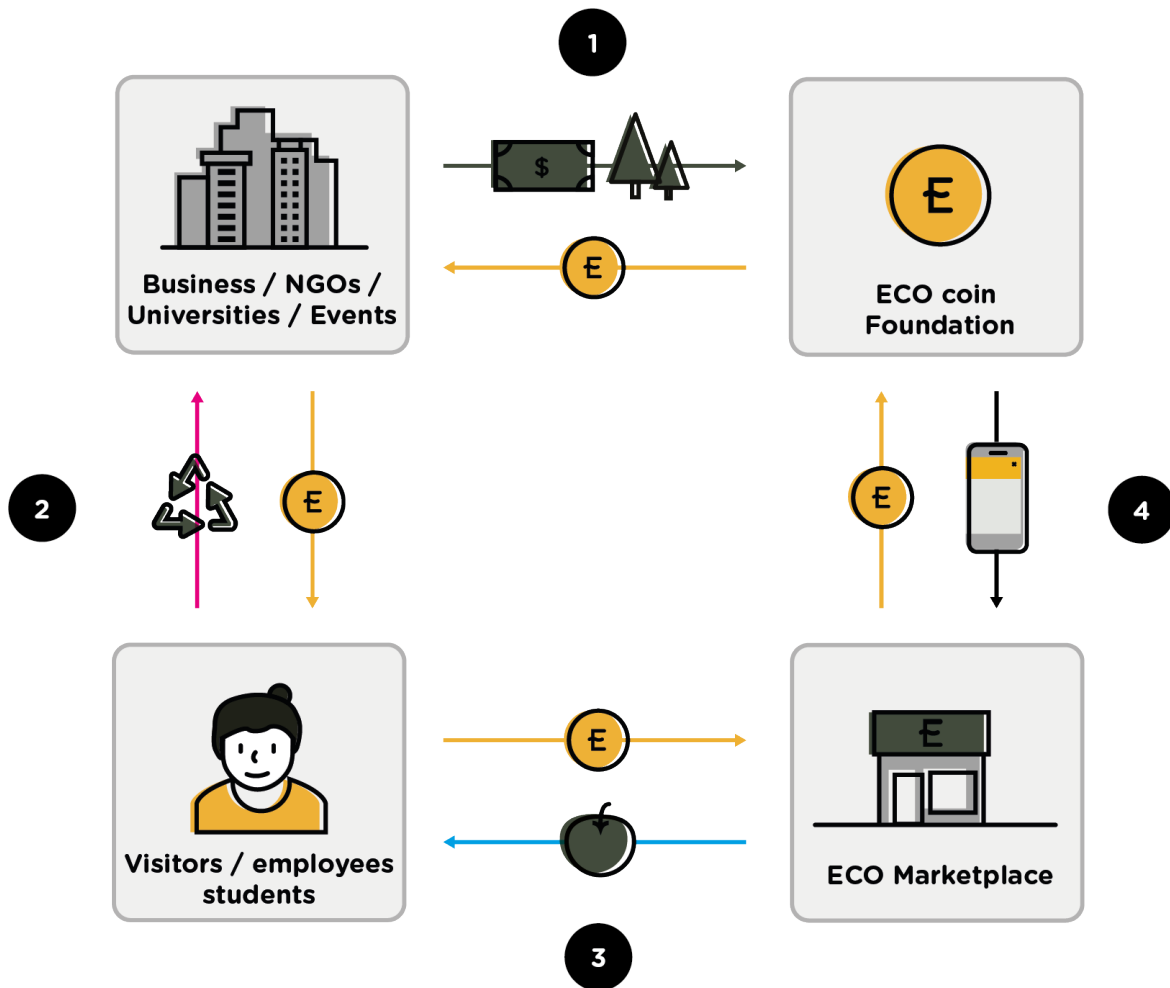
5. https://en.bitcoin.it/wiki/Controlled_supply
 6. <https://www.nature.com/articles/nature14967>

— O4 A Sustainable Marketplace —

What does this new sustainable marketplace look like?

We envision a new sustainable economy and marketplace that can help link up places where ECOs can be earned and spent. The marketplace is flexible and can include places like festivals, events, offices, hubs, hotels, schools, universities, restaurants and cafes. Additionally, places to spend the currency can include retail spaces, online webshops, cultural experiences, museums, cinemas and more.

How does the marketplace work?



1. An organisation wanting to encourage sustainable action purchases ECOs with fiat money or exchanges trees for ECOs. ECOs coins are then released by the ECO coin foundation.
2. The organisation uses these ECOs to engage people in a short or long term campaign to carry out sustainable actions. They can also purchase things directly from vendors.
3. People who earn ECOs can buy sustainable experiences, services and products from any vendors in the marketplace. This can include the organisation that they originally received the coin from.
4. ECOs can be spent by vendors on incentivising new sustainable actions, can be traded with other vendors or can be used to purchase priority advertising and communication space within the digital ECO wallets.

What are some use case examples?

1. Festivals - Festivals are a great place to both earn and spend ECOs as they have everything that you find in a city: food, drinks, electricity, leisure activities, shelter to name a few. With the ECO coin it's easy for event organisers to positively engage their audience to change their behaviour and mindsets⁷. Instead of throwing plastic cups on the floor, these can now earn visitors precious ECOs. The currency can also help create a community vibe by making the way in which you earn ECOs only possible with multiple people involved. The sustainable initiatives can also have a lasting effect after the festival is over. Think groups of friends building bee hotels, birdhouses or planting edible flowers.

2. Offices - A lot of time is spent in offices, which is a great space to change daily habits. Managers and employees can challenge each other to become more sustainable and be rewarded with ECOs when they succeed. There are many office actions that can work: incentivise green transport to and from the office, employees can participate in workshops or eat meat-free lunches. Different departments can even form teams and challenge each other to be the most sustainable in the office.

3. Hotels - Many hotels of the same name or organisation can now be joined up into one sustainable economy with the ECO coin. Earn some ECOs in one city and spend them at another hotel in another city. The ECO coin also enables the hotel to connect to local sustainable suppliers around them. The currency can even be used to guide visitors to sustainable hotspots in the city

or giving visitors a unique chance to help a green initiative. For example, visitors could go on a boat cruise to help fish plastic out of the sea⁸, and can earn themselves enough ECOs to spend on a desert back at the hotel's restaurant.

4. Universities - University campuses are full of the next generation who are ready to live the change they want to see in the world. The ECO coin can be a valuable tool to teach students how economics works as well as diving deeper into innovation within sustainability. ECOs can even be received by participating in certain classes. The coins may even be seen as a sign of the students sustainable reputation that can be shown on their CVs to potential future employers.

5. Retail Spaces - Sometimes the more sustainable purchase is the more expensive one. Well why not promote the green choice and reward sustainable purchases with some ECO coins? This can be a new way to communicate eco-brands and help foster loyalty and a better connection to the customer. Retailers can also accept ECOs as (part) payment for their products. This will also help customers work out which brands and products are the best choice for the environment.

6. Online Platforms - There are many sustainable apps, startups and platforms already out there. The ECO coin can be easily integrated into these so that you can earn ECOs through a recycling app, and spend coins on renting a movie online. The more places ECOs can be earned and spent, the more valuable it will become.

	1	2	3	4	5	6
New engaging experience and promotion for organisation						
Potential reduction of certain running costs (e.g. less waste)						
Help to achieve sustainability goals of the organisation						
Has a network effect linking many communities/spaces						
Captures valuable data sets on people's behaviour						
Creates new standard for evaluating sustainable people						
Attract people to visit a certain physical location						
Works like a loyalty program to attract people to visit again						
Able to own a "green wallet" to void transaction fees*						

*Although we cannot stop ECOs being traded from any wallet to wallet we can make sure that it's more advantageous to be a certified vendor than any vendor. To do this, certified vendors will receive a "green wallet" address that incurs no transaction fee when sending and receiving ECOs.

7. <https://www.nextnature.net/2017/04/eco-coin-dgtl-report/>
 8. <https://plasticwhale.com/>

— 05 Backed by Sustainable Assets —

Why back the ECO coin?

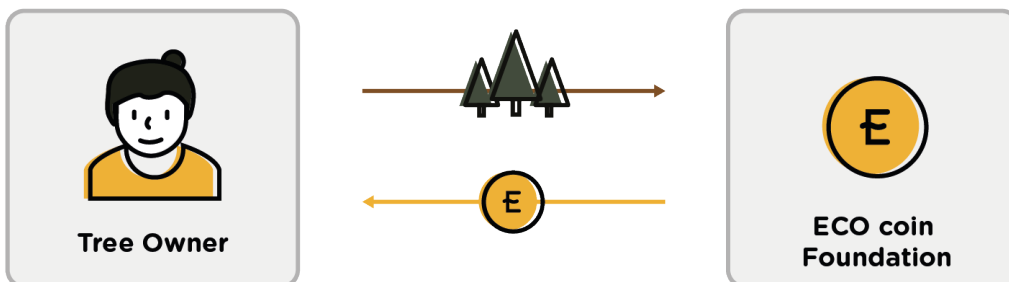
ECO coins are always backed by ecological assets. Every ECO coin is backed by one tree. This will create a new gold standard linking every coin in circulation directly to a part of our ecology. Unlike many other cryptocurrencies, using a backing for our currency will also give every coin intrinsic value.

Why use trees as the backing?

Trees are worth more than the sum of their parts. There are many ways that trees are beneficial to both our economy and our ecology: trees are habitat for biodiversity; trees create much of the planet's oxygen; and, trees help combat climate change as well as playing a key role in agroforestry which helps farmers to improve their land quality and productivity. In addition to providing fruits, berries, nuts and medicines. Trees help to lessen the wind that might affect crops, cool off ground temperatures, and trap moisture and nutrients in the soil so that food crops grow better in the improved microclimate.

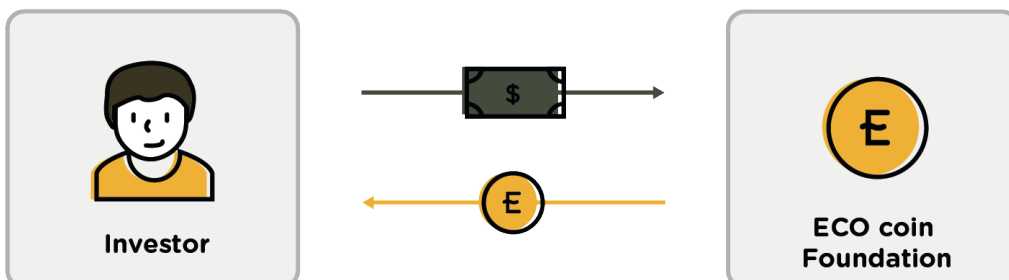
How will this practically work?

Tree owners can exchange their trees for ECO coins. For every ten trees, one ECO coin will be paid out to the owner. The trees are kept in escrow meaning that the ownership stays with the original owner of the tree, though the tree is placed in custody of the ECO coin foundation. A small verification fee is paid to verify the validity, existence and ownership of the tree(s). This verification fee is paid every 100 years to keep proof of the tree. This is one of two ways in which an ECO coin comes into existence. As the tree owner receives one ECO for every 10 trees, the other nine ECOs can be brought into the system when a sustainable action is carried out or any other way an ECO can be earned. (see section 03)



How do we guarantee that every ECO coin is backed?

The other way an ECO coin can come into existence is through it being purchased with fiat money. Purchasing an ECO coin with fiat money through the pre-sale or Initial Coin offering (ICO) will generate funds to cover the planting of any additional trees that are not already covered by trees exchanged for ECOs. It is estimated that a maximum of 10% of the fiat money generated by the pre-sale and ICO will be needed to plant any additional trees. The rest of the fiat money will go into funding the development of the underlying digital infrastructure needed to run the cryptocurrency as well as supporting the growth of the ECO coin marketplace and community.



06 A Living Coin

What happens when a tree dies?

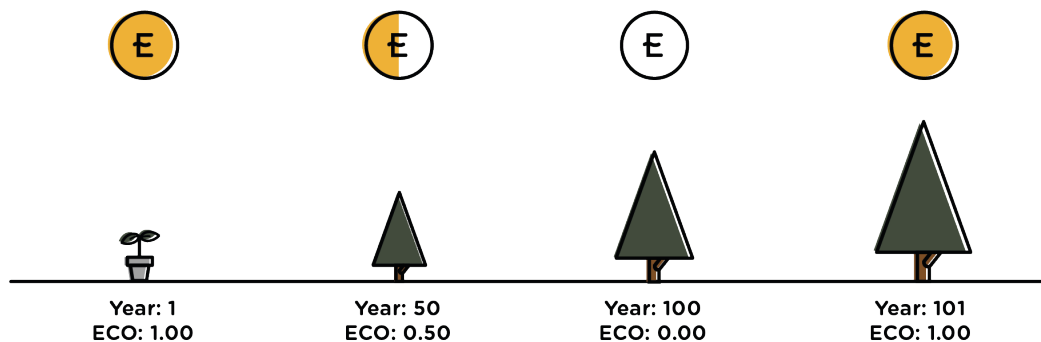
A tree is a living entity that is born and will inevitably also die. Hence, in order to maintain a connection between the tree and the coin, the lifespan of the coin will also have to be finite. At first one might desire every coin to be linked to an actual tree that is constantly monitored; when the tree is cut or dies, it would be logical for the coin to also disappear. A drawback of such a system would be, however, that if you accept an ECO coin you would want to know which tree it is connected to in order to assess its value. It would be like accepting a banknote and wanting to know what piece of gold in which storage is actually backing it; highly impractical and limiting to everyday use. Hence every ECO coin is connected to a tree by proxy.

How are trees of different sizes valued?

Different species of trees have different average life spans and that some trees are among the oldest living things on the planet, while others live for just a some decades. Most trees are at a certain point cut by humans. To keep the system manageable the lifespan of the ECO coin is linked to the average tree lifespan (ATL).

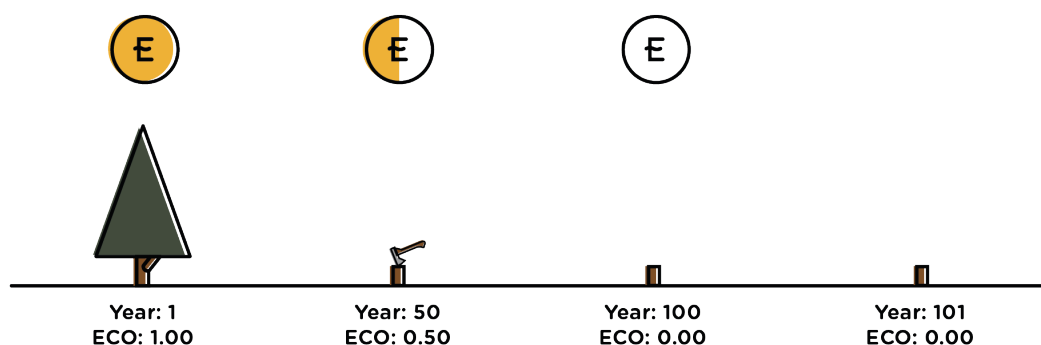
How does a living coin work?

This means that every ECO coin slightly deteriorates with a small percentage to match it with the average lifespan of the tree that is backing it⁹. So if the average tree lifespan ATL = 100 years, every ECO coin will deteriorate by 1% on a yearly basis. Although this may seem like a drawback for ECO coin owners, it is not different from traditional inflation on traditional currencies, which is on average much higher than 1%. Rather than having a central bank causing inflation by printing new money, with ECO coin it is programmed in the system to maintain its sustainable backing.



Will new coins be generated if old coins decay?

While old coins deteriorate over time and eventually no longer exist, new ones can be generated as new sustainable assets are added or existing ones are renewed. If the tree still exist after passing of the ATL period, it can again be added to the to the system, validated and generate a new ECO coin. Tree owners may also choose to cut trees and plant new trees but they can only be added to the system after passing of the ATL period. This ensures that for every ECO coin that is generated a tree exists at the moment of the birth of the coin. This counters potential corruption by planting trees, cutting them the year after and planting a new one to generate new ECO coins. If the tree is very old, it is renewed or if it is cut down, a new tree will have to be planted to generate a new coin.



— 07 A Democratic Community —

How will the ECO coin be a sustainable blockchain?

Some blockchains, like Bitcoin, use a Proof of work consensus¹⁰ algorithm to secure their networks. Though this method is robust, as time has gone on it is clear to see that the energy usage of such a system is unsustainable. As of writing some reports estimate that Bitcoin mining is using as much energy as the country of Denmark¹¹. To avoid heavy use of energy the ECO coin will use a Proof of Stake consensus model. This will also allow for ECO nodes to be present so as to decentralise governance.

What are ECO nodes?

Nodes are a way to participate in the network. Anyone can run a node which essentially means that a person is running the entire ECO coin ledger on their device. This could be a mobile phone, laptop or desktop computer. Nodes are not required to earn and spend ECOs but are needed if you want to take part in the decentralised autonomous charity.

What is a decentralised autonomous charity?

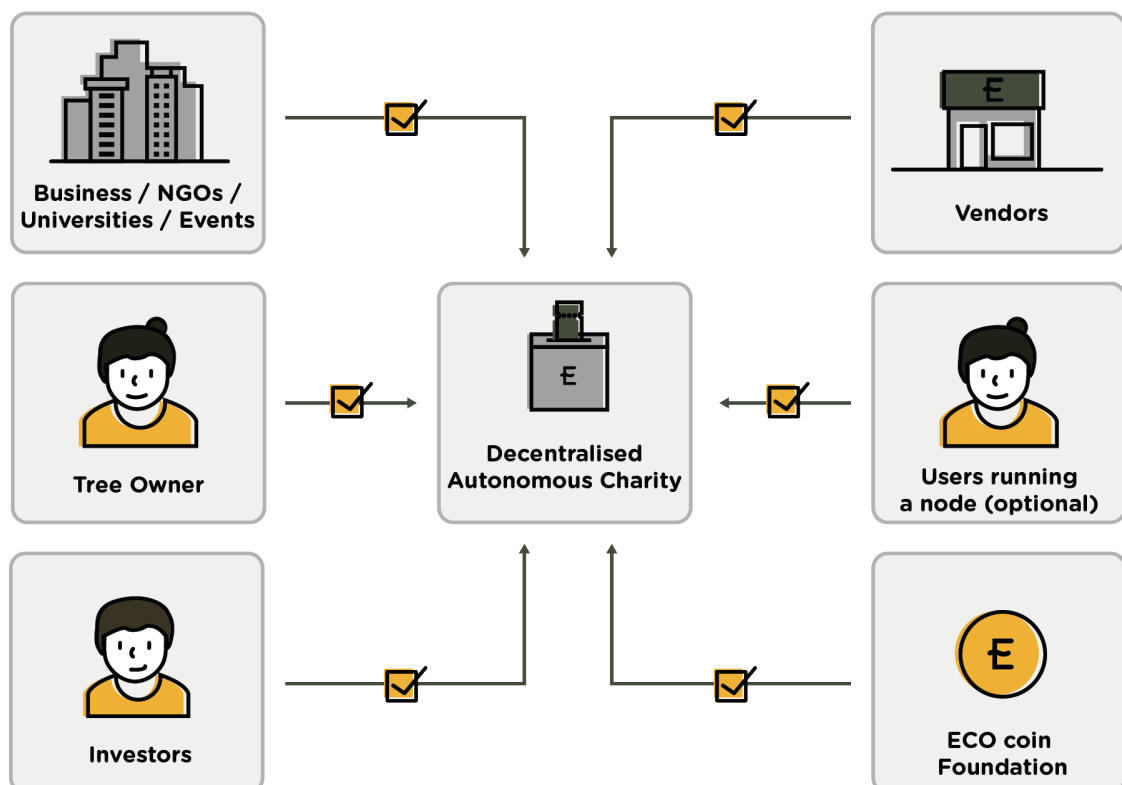
The ECO coin network will not be controlled by one single party but by the community who uses it. Anyone running a node will be able to participate. This will work by utilising the blockchain to create a Decentralised Autonomous Charity (DAC) whereby holders

of ECO coins will also have a vote in the development and direction of the platform and currency. The DAC is built upon a smart contract. So instead of a single human or organisation having the final decision, it is up to the community to vote and the outcome of this vote automatically triggers the smart contract to carry out the desires of the majority of the community. Community members can also propose their own questions to the community and get input from others. The results of these questions are not binding unless also approved by the ECO coin foundation. Decisions that the DAC can decide on include:

- Development direction
- Bounty rewards program
- Which sustainable initiatives to support
- Where to plant trees
- Budget oversight and proposals
- New partnerships

Who can vote?

Anyone who holds ECO coins in their wallet and is running a node has a voice within the DAC. We want the community who uses this currency to also be a part of its future developments. Letting many stakeholders vote will also ensure that the system remains balanced and fair.



10. https://en.bitcoin.it/wiki/Proof_of_work

11. <https://digiconomist.net/bitcoin-energy-consumption>

08 Roadmap

The ECO coin has been under development since 2009. We have trialled the currency in many different contexts through our living labs to build a community around the project. Going forward we have ambitions to take on investment so that we can further build the platform, reach many more and balance economy and ecology.



09 Team and Partners

Team

Koert Van Mensvoort - Creative Director
Lewis Just - Project lead of the ECO coin
Anatal Perlin - Strategy and Partnerships
Koen Blezer - Blockchain Engineer Intern
Ruben Baart - Communications Manager
Kate Rolfe - Vendor and Marketplace Manager
Peter Sijmons - Advisor

Partners & Supporters

Eindhoven University of Technology
Stimulerings Fonds Creatieve Industrie
Bankgiro Lottery Fund

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Anna Van Nunen, Director of Innofest
Nadja Zeiske, PHD Researcher, University of Groningen
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Edgar Kampers, Co-founder of Qoin
Roel Kampers, COO of Qoin
Geert Meeder, Technology Manager, Qoin
Herman Wijffels, Economist

Siebren de Vos, Gamification, NNN Intern
Paul Farrow, Investor
Jop Japenga, Design-researcher
Billy Schoonenberg, Design-researcher
Marcel van Heist, Design-researcher
Luna Maurer, Designer
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Frank Gorter, Steward of Welna Estate
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Tim Agter, Bam Producer, Booking.com
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11 Contact

For more information or inquiries please get in contact with our team at hello@ecocoin.com.
For opportunities on becoming part of the new sustainable marketplace mail labs@ecocoin.com.
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