

## THE ZERO2NATURE BLOCKCHAIN

The purpose of this paper is the introduction of the first alternative currency based on the proven removal of negative human environmental impact, here also treated as diseconomies. We hope that by the end of this document we will have succeeded in sharing our vision of a system that effectively cleans and preserves the environment, creates employment and generates wealth.

The ZerO2Nature System is based on a couple of key concepts that are important to explore and grasp in order to capture its full spirit and potential. First of all, knowledge about the basics of an environmental standard is necessary in order to assess how ZerO2Nature has been able to universalize the treatment of all types of anthropic negative emissions, as opposed to a scheme like Carbon Credits, which only focuses on greenhouse gases. Secondly, some understanding about the fundamentals of a blockchain is paramount in order to evaluate the incentive mechanism for offsetting emissions and how the DTUcoin (DTX) is created in contrast to a cryptocurrency like Bitcoin, which relies heavily on computational capacity and electric energy.

### **Environmental Standards**

An environmental standard is basically a set of rules that objectify the removal of a given type of negative environmental impact. Environmental standards can both be adopted by a group of countries through the signing of a treaty or be of a voluntary nature amongst a group of concerned participants. One of the first of such international mechanisms was introduced to combat the depletion of the ozone layer. This led to the banishment of CFCs from aerosols and marked the beginning of an era, where local pollution problems needed to be addressed from a global perspective.

Other environmental mechanisms followed culminating with the Kyoto Treaty, which tackled the controversial, but serious problem of climate change. In this case, member countries were assigned CO<sub>2</sub>-equivalent emission targets and their respective governments were responsible for the curtailment of greenhouse gases within established sectoral scopes. In all cases, the primary incentive for industries to lower their emissions was the alternative payment of heavy fines issued by their governments. Notwithstanding, industries were offered a second option of buying emission reduction volumes (Allowances) from counterparties that had overachieved their goals and even a third option that allowed industries to purchase Certified Emission Reductions (CER) from projects that effectively removed a certain volume of CO<sub>2</sub>-equivalent emissions. This market-based approach led to the development of the emissions trading market, which until 2012 had an approximate value of US\$150 billion.

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The problem with the emissions trading market was that it relied entirely on government enforced emission reduction targets. Once these targets were no longer in place (failure of the Kyoto Treaty second commitment period), the whole emissions trading market collapsed.

Despite enormous public concern and political will to address environmental challenges, there are three main reasons why the problem continues to grow. The first reason is that the treatment of negative environmental impact as separate instances of smaller dimensions causes loss of focus and objectivity. For example, the debate on the theory of anthropic global warming has weakened consensus on tackling climate change. Moreover, countries rarely reach consensus when economic and social development are at stake. For example, countries like India or Brazil will not enforce environmental restrictions at the expense of economic and social progress. Ultimately, letting governments speak out for popular concerns about the environment, at a global level, has proven ineffective and has led to a decrease in public interest. And finally, punitive measures (fines) have demonstrated that they do not work in the long run, since industries (the hardest hit sector) will simply relocate to a less restricted country.

In response to the first problem, the ZerO2Nature system has uncovered a way to unify all sorts of man-made environmental impact and has been able to create one universal measuring unit towards this end.

In our economy, everything we produce creates a measurable amount of human environmental impact. This impact is also known as a diseconomy. Through a model that takes into account all types of human environmental impact (Environmental Impact Potential – EIP [calculator](#)) ZerO2Nature has been able to calculate the diseconomy cost for any productive process. Therefore, we can compare and apprehend that the diseconomy of a pair of jeans is much higher than the diseconomy of a pair of polyester trousers. It becomes easy to understand the weight of one environmental impact in relation to another when we compare them in monetary terms. Through this method we are able to follow a unified path, which allows us to achieve concomitant results. Whenever we reduce diseconomies, we are essentially preserving forests, rivers, biodiversity, our mineral and oil reserves, and improving the technology of our production processes. Where the Kyoto Treaty had to continually argue the question for anthropic global warming, ZerO2Nature is exempt of proving that pollution carries a significant toll on the environment. Furthermore, where the Kyoto Treaty addresses problems related to the emissions of a handful of greenhouse gases, ZerO2Nature's scope is universal and related to all types of negative human impact on nature.

With the monetization of diseconomies, the negative emissions of productive cycles become raw materials for other cycles, uncurtaining infinite possibilities. Analogous to the way in which companies began producing oil in the North Sea, once the cost-benefit relationship becomes favorable, diseconomies with absolute attributable market values, will demand studies, transformative ideas, new technologies and manpower, the result of which will contribute significantly to the growing challenge of employment creation (see the book "[Epiconomy and the Post Covid19 World](#)").

With relation to the second issue, ZerO2Nature is a crowd effort, with many types of participants, without borders and a common purpose: the reduction of diseconomies. The ZerO2Nature system does not hamper economic and social development. Much to the contrary, the ZerO2Nature system provides economic opportunities in less developed countries, substituting extractive models for eco-sustainable alternatives. Moreover, the utilization of a currency that results from the removal of negative environmental impact transfers power back to the public, for it becomes an efficient and democratic mechanism that leverages eco-sustainable action across all sectors of the economy.

Finally, with relation to the last issue, the ZerO2Nature system adopts an incentive mechanism based on rewards, rather than on punitive measures. And in order to illustrate this point more clearly, we need to cover a few key aspects of a blockchain.

### Blockchains

Blockchains have become increasingly popular mainly due to the hype around major cryptocurrencies but also given their intrinsic properties that provide qualities such as transparency, anonymity and decentralization. A blockchain is essentially a publicly available list of transactions that cannot be altered once they are agreed upon by a peer-to-peer network. In order to perform transactions, participants of a blockchain must have a public and private key-pair, and access to its core software. Every blockchain starts with a genesis block and runs according to a previously determined set of rules, enforced by computer code. The Bitcoin blockchain for example, creates a new block of transactions at every interval of 10 minutes. All the computers that form part of the Bitcoin P2P network (called nodes) have a copy of the consensus blockchain, and their job is to compile the next list of transactions that will be added to the previously accepted block. In order to win the privilege to present the next block, a node has to solve a puzzle (finding of a “nonce”) which requires intensive computational work. The node that successfully “mines” a new block is awarded 6.25 BTC (started with 50 BTC and is halved every 4 years) and also receives the transaction fees related to that block. Through this mining process, called “proof-of-work”, the supply of BTC is increased until it reaches the maximum supply of 21 million units.

Bitcoin has been the forerunner in terms of cryptocurrencies and has currently (March. 10, 2021) the highest market value, followed at a distance by Ethereum and Ripple.

Code	Name	Start Date	Price USD	Market Value USD
BTC	Bitcoin	03/01/2009	56,128.47	1,050,000,000,000
ETH	Ethereum	30/07/2015	1,844.11	212,040,000,000
XRP	Ripple	02/02/2013	0.4719	99.001.000.000
BCH	Bitcoin Cash	01/08/2017	547.97	10.230.000.000
ADA	Cardano	29/09/2017	1.174	37.670.000.000
LTC	Litecoin	13/10/2011	203.51	13.670.000.000

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XLM	Stellar	02/06/2014	0.419788	44.260.000.000
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As can be observed from the table above, many cryptocurrencies following the trend initiated by Bitcoin have achieved remarkable results. Many of them having reached a market cap superior to US\$1 billion even in their first year. What differentiates one cryptocurrency from another are mainly proposals regarding better or different security, contract or platform features, different parameters, monetary policy, and community or common interest support (for further information, please visit <https://www.cryptocompare.com/coins/list/USD/1> ). The single biggest concern however, is the massive requirement of computational hardware and electricity (48.2 TWh per annum to mine Bitcoin, comparable to the consumption of a country like Singapore) needed to support a mining network based on the “proof-of-work” concept. While new puzzle strategies are being worked-out and it is likely that the second largest cryptocurrency Ethereum will migrate to a concept called “proof-of-stake”, ZerO2Nature has developed a mechanism based on “proof-of-offset”, which functions as the perfect incentive mechanism for diseconomy reductions. Through this method, Offset Agents (mostly industries) are incentivized to reduce their diseconomies by Promoters participating in the O2N-Blockchain. In other words, Promoters motivate businesses to reduce their diseconomies by purchasing DTUs, retiring them according to ZerO2Nature rules and regulations, whereby they receive Certificates of Retirement (CoRs) that are transformed into the alternative currency DTUcoin (DTX).

### DTUcoin (DTX)

The DTUcoin (DTX) is an Altcoin that finds its physical basis in the Diseconomy Traded Unit (DTU), resulting from a project that removes negative emissions and a productive cycle that retires it, according to the ZerO2Nature Standard. In order to significantly curb the level of environmental impact across the full spectrum, the ZerO2Nature system provides a framework that regulates the creation and retirement of DTUs. Due to the problem of differing scenarios and reference substances, DTUs are divided into the following types: B-DTU, a diseconomy traded unit arising from the preservation of biodiversity; C-DTU, a diseconomy traded unit arising from the preservation of hydrocarbon reserves; F-DTU, a diseconomy traded unit arising from the preservation of forests; H-DTU, a diseconomy traded unit arising from the preservation of water reserves; M-DTU, a diseconomy traded unit arising from the preservation of mineral reserves and N-DTU, a diseconomy traded unit arising from the optimization of anthropic productive cycles. And finally, each type of DTU has a conversion factor that finds its equivalency (see [http://www.zero2nature.org/dtu/Directives\\_equivalency\\_DTU\\_2021.pdf](http://www.zero2nature.org/dtu/Directives_equivalency_DTU_2021.pdf)) in a DTUcoin (DTX).

## ZerO2Nature Blockchain Participants

The DTU/DTX process involves the following participants:

- Project proponents - the implementers of a registered negative emissions removal project, and therefore creators and owners of DTU;
  - Project proponents can be companies, individuals, governments or associations;
  - In order to propose a project and receive DTU, project proponents must:
    - Submit a Project Design Document and;
    - undergo a rigorous certification process as illustrated in the figure below:

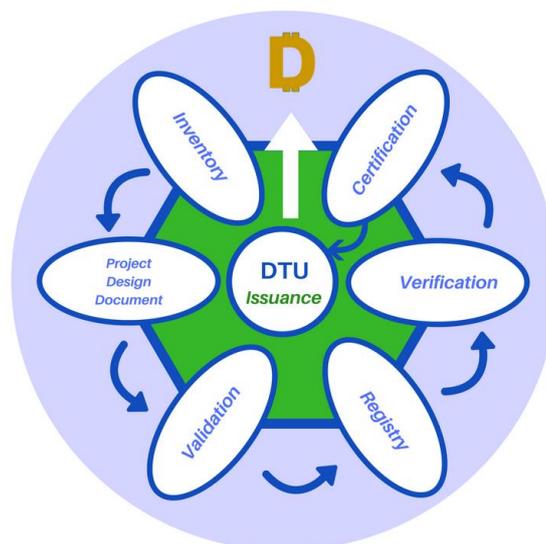


Figure 1: DTU process

- Designated Environmental Certifiers (DEC) - Responsible for the validation and verification of DTU generating projects, as well as for their certification;
- O2N Executive Committee (EC) - Responsible for the correct application of the standard, methodologies, tools, guidelines and all other requirements necessary for the perfect operation of the system, including the registration of proposed projects. The Executive Committee is the last instance of the ZerO2Nature system;
- Promoters - all those interested in incentivizing and creating new DTU and DTUcoins (DTX);
- Offset Agent – any entity responsible for a productive cycle. The Offset Agent neutralizes negative emissions by retiring DTU;

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- Users - all those who have a cryptographic key (public and private) to access the O2N-Blockchain and who own DTUcoins (DTX). This segment includes individuals, merchants, banks, exchanges, payment systems, etc.



Figure 2: DTUcoin Card and App

### The O2N-Blockchain mechanism

The O2N-Blockchain Genesis-block will start on the Ethereum Blockchain as an ERC-20 Token Contract, until the mark of 2MM DTX (ramp up phase). Currently, there are already 544,838 units awaiting conversion resulting from the retirement of DTU that were generated by a forest preservation project (F-DTU) and a biodiversity preservation project (B -DTU), in the state of Maranhão, Brazil. An extra 1,455,162 units are expected to be retired over the course of 2 years, resulting from a series of COVID19 health relief projects, other diseconomy project activities in development and a number of migrated UN Clean Development Projects.

During the ramp up phase, the O2N-Blockchain will be developed and deployed. Upon its launch, the 2MM original DTX will become fully integrated and gradually leave the Ethereum Blockchain.

So how does a DTUcoin (DTX) come into existence on the Ethereum/O2N Blockchain? First of all, a project that effectively removes a volume of diseconomies according to the ZerO2Nature Standard needs to occur. In this phase, Promoters function as communication agents, alerting potential Project Proponents of the underlying opportunities in developing a ZerO2Nature project. Once projects are registered, they are submitted to a period of verification, in order to assess the quality of their commitment in removing diseconomies. Upon successful certification, projects are awarded a number of Diseconomy Traded Units (DTU) by the ZerO2Nature Executive Committee (EC), according to their type of diseconomy removal. At this point, Promoters once again enter the stage, targeting and convincing potential Offset Agents. Offset Agents are usually industries responsible for high rates of emissions, that purchase DTU from Project Proponents, in order to offset their diseconomies. In order to become an Offset Agent, a company must undergo a selection process overseen by the EC that involves ESG criteria. Thereafter, upon the presentation of an audited diseconomies report, the Offset Agent may retire DTU up to its assigned limit and in return, receive Certificates of Retirement (COR).

Finally, in exchange of a Certificate of Retirement (COR), a DTX can be minted on the O2N-Blockchain. One COR is worth 75% of a DTX. The remaining 25% is distributed between Promoters and ZerO2Nature.

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In summary, the ultimate goal of the ZerO2Nature system is the retirement of DTU, which proves that negative emissions have effectively been removed from production cycles. Therefore, the incentive mechanism is paramount and therein the importance of Promoters: Every time a Promoter meets a goal he/she wins an amount of Sponges (SPG). Sponges are winnable through challenges created by ZerO2Nature in order to stimulate the development of new DTU generating projects, the involvement of new Offset Agents and the promotion of DTUcoin (DTX) throughout the retail environment (points of sale). Promoters accomplish the tasks of educating thousands of users with regards to the ZerO2Nature system, communicating the main concepts of a ZerO2Nature world and incentivizing participation. Each SPG is equal to 0.00001 DTX and the current Sponge (SPG) per DTU Challenge Table is available at <http://zero2nature.org/promoter/>.

It is important to note that while all transactions related to the creation process of DTU are being recorded on the blockchain, the O2N-Blockchain offers the same currency applications as for example Bitcoin. Since it uses industry standard code, DTX can be accepted at points-of-sale, traded on exchange platforms and securely stored as an asset. However, DTX goes beyond any other cryptocurrency because of what it symbolizes and effectively accomplishes: a cleaner planet! For this reason, the potential for acceptability is far greater than cryptocurrencies that do not possess an underlying base. Another important distinction and advantage rendered by the O2N-Blockchain and DTX is that the monetization of diseconomies allows for universal consensus on the pricing of anthropic negative emissions. As such, the proven removal of diseconomies meets the commodity definition, and their proof (COR), fulfill the underlying asset function in the derivatives industry, opening up a whole new avenue for financial exploration.

### **O2N-Blockchain as a virtuous bootstrap process**

Starting with the Genesis-block of the O2N-Blockchain, a bootstrap process occurs, where Promoters stimulate new Project Proponents to generate new DTUs, that are retired by Offset Agents, generating DTX (which prove - through objective evidence - the removal of diseconomies from anthropic productive cycles), which can be transacted amongst Users (consumers, merchants, investors, payment services, exchanges etc.). The higher the demand for DTX, the more diseconomies are removed from nature.

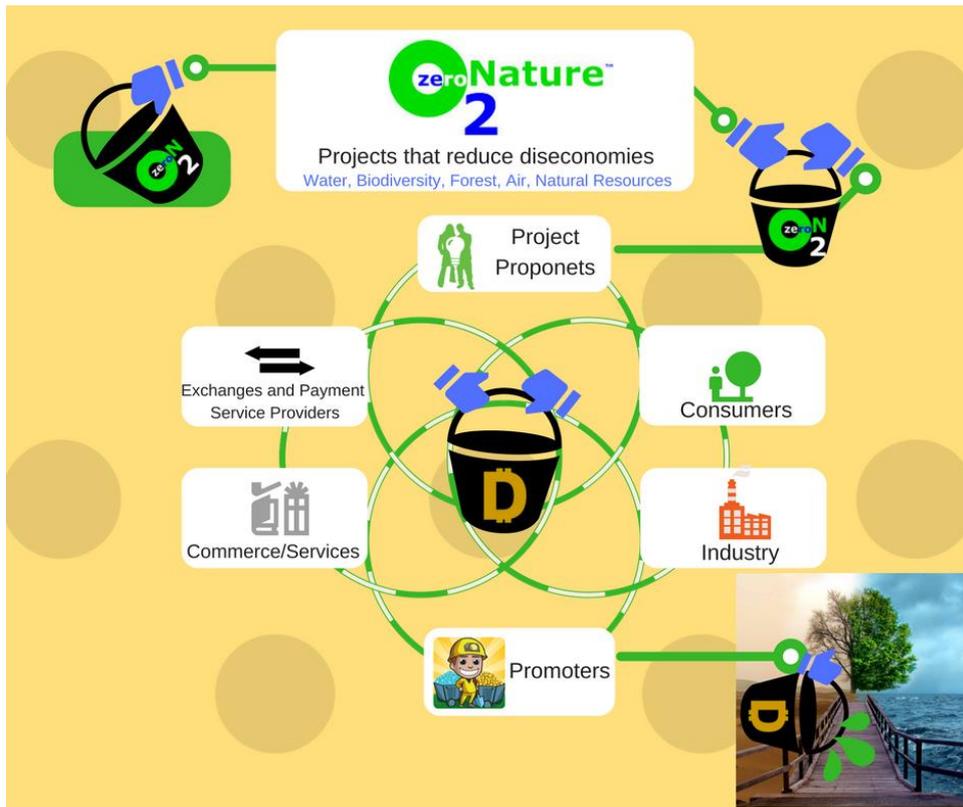


Figure 4: Virtuous cycle

We hope that we have been able to clearly demonstrate how the O2N-Blockchain and its currency, the DTUcoin (DTX), meets all the requirements for becoming a major contender within the alternative currency space and carry out its ulterior purpose of effectively cleaning the environment while generating wealth and employment.

## Background

The ZerO2Nature concept was publically revealed for the first time at the Rio+20 Convention, in Rio de Janeiro, Brazil on June, 13, 2012, with the presentation of “A ZerO2Nature Refinery”. A company (ZerO2Nature B.V.) was formed in 2014 in Amsterdam, the Netherlands. The current team is comprised of the following members:

- I) Patrizia Tomasi-Bensik – CEO and Member of the ZerO2Nature Executive Committee.

Education: PhD in Chemistry (Federal University of São Paulo, Brazil), Degree in Mechanical Engineering (Federal University of Rio de Janeiro, Brazil), Degree in Chemical Engineering (Mackenzie Presbyterian Institute São Paulo, Brazil) and a Post-Graduate Extension in Quantum Mechanics (ETH – Department of Physics, Higher Technical School, Zurich, Switzerland).

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Patrizia is a 187 IQ genius, pupil of Wolf prize winner and experimental physicist Valentine Telegdi. She is a member of the UNFCCC assessment team and CEO of Planck E;

- 2) Gertjan Berndt Beekman – Chairman of the ZerO2Nature Executive Committee.

Education: Civil Engineer (Scranton Schools-PA-USA; Faculty of Technology São Paulo; Dip. Hydrologist-Applied Hydrology- IHE-Delft-The Netherlands), has a Licentiate Thesis and Doctorandus Thesis in Social Change and Resettlement Related to Water Resources Planning and Development (KTH-Stockholm-Sweden). Gertjan is the General Director for the Inter-American Institute for Cooperation in Agriculture stationed in Brasília, Brazil;

- 3) Marco Aurélio da Silva Ramos – Vice-Chairman of the ZerO2Nature Executive Committee.

Education: Master degree in Mechanical Engineering (Federal University of São Paulo, Brazil), post-graduation in Economics (Federal University of São Paulo, Brazil), post-graduation in IT, Mathematics and Business Economics (Federal University of São Paulo, Brazil).

- 4) Manohar Baharani – Technical Director of the ZerO2Nature Committee.

Education: Post Graduate Diploma in Environmental Law, 2001-02 from the National Law Institute of India University, Bangalore, India. Moreover, he has a Bachelor in Electrical Engineering from the National Institute of Technology, Raipur, Chattisgarh, India. Manohar is a consultant for the World Bank and the United Nations.

- 5) Hinrik Caspar Bensik –Business Director.

Education: Bachelor of Arts in International Business Administration from the University of Paris, France. Caspar is VP of Planck E.

Further reading about ZerO2Nature, DTX and related materials are available on demand or published on the ZerO2Nature website at [www.zero2nature.org](http://www.zero2nature.org) and include:

- 1) ZerO2Nature Blockchain Proto-Genesis Block;
  - a. List with all documentation, projects and pertinent actions taken by ZerO2Nature since its inception;
  - b. Link: <http://zero2nature.org/blockchain/proto-genesis.php> .
- 2) Book by Patrizia Tomasi-Bensik:
  - a. Epiconomy and the Post COVID19 World;

b. Link:

[https://www.amazon.com/gp/product/B08HMDDNDL/ref=dbs\\_a\\_def\\_rwt\\_bibl\\_vppi\\_i0](https://www.amazon.com/gp/product/B08HMDDNDL/ref=dbs_a_def_rwt_bibl_vppi_i0)

3) Founders Articles:

a. Link: <http://zero2nature.org/articles/>

b. Artciles by Patrizia T. Bensik:

- i. Against the grain of common sense;
- ii. How we arrive at a ZerO2Nature world;
- iii. Epiconomy and the Future of Employment;
- iv. How to Assess a GHG Project;
- v. Take a Walk on the Wild Side;
- vi. The EIP Concept;
- vii. The Era of Intangible Goods;
- viii. The Time for a New Approach;
- ix. The Wow Factor;
- x. The ZerO2Nature Ecocredits;
- xi. Through the Looking Glass;
- xii. When Size Really Matters;
- xiii. Why Should I Know More About Diseconomies;
- xiv. From Carbon to Eco-Credits;
- xv. DTUcoin: Money That Grows on Trees;

c. Article by the Technical Director, Manohar Baharani;

d. “What is a DTUcoin” by Hinrik Caspar Bensik.