Ecobricks & Brikcoins

A Commodification of Sequestered Plastic

Ecobricks & Brikcoins

Whitepaper

08/28/19

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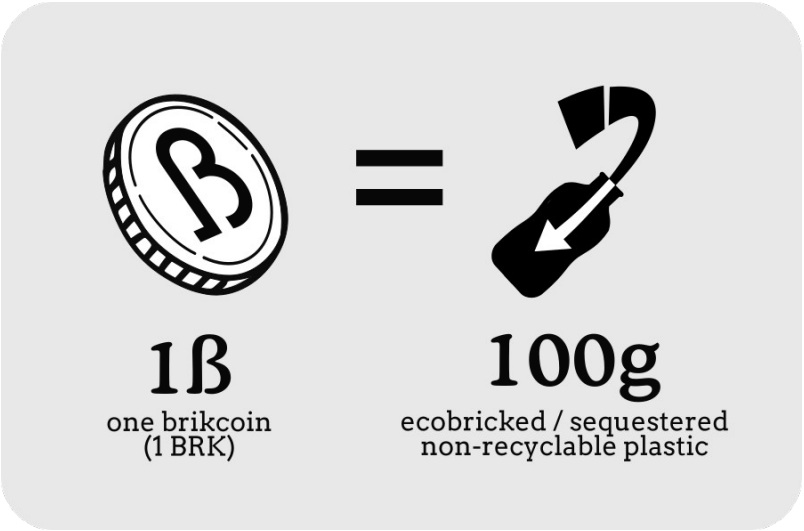
ecobricks.org
Global Ecobrick Alliance

"We envision a Transition from plastic in our Homes, Communities and Companies to an ever greener harmony with Earth's cycles."

- Global Ecobrick Alliance Vision



Term: Brikcoin

Abbreviation: BRK

Currency Sign: ß

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The Global Ecobrick Alliance

The GoBrik platform and its development are managed by the Global Ecobrick Alliance (GEA). The GEA is a not-for-profit 'Earth Enterprise'(EE) guided by our publicly accessible Intention Map[1], core team and circulars. As an EE the GEA is structured to have no profit motive and a mission and vision focused on serving the Earth. As per our principles we have no corporate or business sponsors or donors. In this way, we aim to define the GEA as an impartial third party catalyzing individual, community, company and national transition.

Earth Enterprise

As an Earth Enterprise (EE) the GEA operates under strict principles.[2] An Earth Enterprise is built on the concept of a 'social enterprise'-- where instead of a focus on social service, our service is to the Earth. The concept is inspired by the work of Mark Donovan developing the idea of an "Earth Corporation"[3] and the 'not for profit' (as opposed to a non-profit) concept by of the Post Growth Institute[4]. As an Earth Enterprise, the GEA operates on seven fundamental principles (see appendix 1) that ensure that our goals, operation our results are deeply in line with our principles, vision and mission in both the short and long-term as laid out in our GEA Earth Enterprise Intention Map.

"Urgent, ambitious action is necessary to stop the climate impacts of plastic."

– 2019 Report: Plastic & Climate

The Hidden Costs of a plastic Planet

Summary

Plastic pollution is one of the crises of our times. The plastic that we consume today will endure for centuries, either the detriment or enhancement of local and global ecologies. Over the last fifty years, it is estimated that only 9% of plastics have been captured by the industrial recycling system, resulting in the majority of plastics reaching the biosphere[5]. Once loose, plastic degrades into microplastics, greenhouse gases and toxins which risk disrupting ecological cycles for centuries to come[6]. Participation in post-industrial, petro-capital economy increases the creation of plastic and its flow from resource to the biosphere.[7] Carbon credits and the advent of cryptocurrencies provide a direction for transitional solutions.

Conversely, plastic presents its own solution[8]. The enduring properties and universal availability of non-recyclable plastic make it ideal for the making of reusable building blocks, known as *ecobricks*. Ecobricking adds value to previously valueless used plastic in three ways. First, ecobricking enables the *terminal reduction of the plastic's surface area*[9]. This effectively secures the plastic's hydrocarbons (potential microplastics, toxins and greenhouse gases) from the main forms of potential degradation in a valuable ecological service we call *plastic sequestration*[10]. Secondly, ecobricks turn waste plastic into useful building blocks for making furniture, gardens and structures. Thirdly, the logging and authentication of ecobricks enables the quantification of sequestered plastic into units. The securing

of toxins, the utility-addition and the quantification of plastic that ecobricking enables, lay the foundation for a revolutionary new way to value plastic.

In this whitepaper, we describe the context, scientific understanding, and our vision for a manual block chain, proof-of-work method, for commodification of sequestered plastic. We, the Global Ecobrick Alliance (GEA), have developed a token, known as a *Brikcoin* (BRK) to represent the commodified value of *the absence of plastic from the biosphere* or, in other words, the value of s*equestered plastic.* Brikcoins are generated on the GoBrik app platform through the logging and authentication of ecobricked plastic by our community of ecobrickers. In addition to generating Brikcoin tokens, the authentication process improves collective ecobricking, enables trust in peer-to-peer exchanges and the sharing of ecobricks between projects. A beta, proof-of-concept platform is currently live and, as of June 2019, has secured 10,000 Kg of plastic and generated 70,000 BRK[11]. The platform is maintained and developed by the GEA under the principles of a not-for-profit Earth Enterprise to maintain focus and impartiality.[12]

Ecobricking in itself raises ecological consciousness, empowers communities and energizes local and global plastic transition[13]. Brikcoins value and incentivize the sequestration of plastic, and reward those doing the hard work. Ecobricks and the Brikcoin manual blockchain present a concept-proven, eminently scalable and systematic solution to stem the flow of plastic entering the biosphere. In this way we are preempting the untold harm of countless humans, animals and organisms from the effects of plastic contamination over the next thousand years.

Context

The Petroleum Age & Plastic

The widespread adoption of fossil fuels as a source of energy has defined the 20th century. It has also been instrumental in the production of ultra-cheap plastics. In the refinement process, between 4-13% of crude oil cannot be distilled into high value, high energy fuels.[14] This by-product is however useful as a feed-stock for polymer plastics production. Since 1950 an estimated 8300 million metric tons (Mt) of virgin plastics have been produced worldwide; 9% of which have been recycled, 12% were incinerated and 79% have accumulated in landfills or the natural environment.[15] This production trend is set to continue and increase from 2019 on: according to the American Chemistry Council, since 2010 $186bn dollars is being invested in 318 new projects to fuel a 40% increase in plastic production over the next decade[16]. If current production and waste management trends continue, roughly 12,000 Mt of plastic waste will be in landfills or in the natural environment by 2050.[17] In addition, by 2030, CO2 emissions from the production, processing and disposal of plastic could reach 1.34 gigatons per year—equivalent to the emissions released by more than 295 new 500-megawatt coal-fired power plants.[18]

Systemic Biases in Fiat Currency

Post-industrial capitalism has boomed throughout the last century in direct correlation to those economies with access to petroleum resources. The availability of inexpensive petroleum-derived energy continues to enable and drive global economic growth[19]. These economies issue fiat currencies as the de facto medium of exchange based on debt with interest attached. This system, inextricably connected to petroleum derived energy, drives competition and production for the growth of capital alone. The value of this capital has little correlation to the health of ecological systems and much to

the consumption of petroleum-derived energy. This leads to environmental degradation and the continued use, burning and processing of fossil fuels as capital economy runs. Practically, this means the ongoing creation of plastic and carbon dioxide (C02). A strong correlation between national and global plastic waste generation and gross national income per capita is observed[20]

Industrial Incineration

Burning has been a means to deal with waste for centuries. More recently, this waste includes plastic. In modern times, industrial incineration has evolved from open burning and has been increasingly used for the controlled burning of municipal solid waste, often for energy creation, over the last two decades. Varying levels of toxic chemicals, ash and emission gases are formed[21], depending on the temperature and presence of oxygen during combustion. Despite regulation and technology to treat the toxic substances produced, industrial incineration does still release (albeit low levels of) harmful emissions into the atmosphere[22]. Plastic packaging burned in the open releases 2.9 Mt CO2e of green-house gases into air per ton of plastic packaging.[23] One ton of industrial incinerated plastic release a minimum of 0.9 Mt of net CO2e emissions, even after taking into account the electricity generated by the combustion process.[24]

Many modern incineration facilities have helped cities reduce the volume of waste and relieve the burden on landfill sites. In many cases, these facilities generate heat for local distribution and/or electricity for the national grid,[11,25] although these are only about half as efficient as conventional power stations[11]. Incinerators that collect municipal and business solid waste typically combine both plastic and other waste as this makes processing easier and maximizes the mass for combustion. The burning of organic substances such as paper and food waste is considered a renewable source of energy and has less of an impact on the environment. The burning of fossil-based plastic is not; therefore industrial incineration of mixed residual waste is considered only partially renewable[26]. Critics also observe that incinerators entrench a dependence on waste generation and note that this dependence diverts waste away from circular recycling streams[27]."

In cities such as Singapore and Tokyo where incineration is implemented, citizen segregation of materials has dropped to near zero[28]. Critics observe that incineration minimizes citizen participation and decreases public ecological consciousness. Incineration provides no mitigating incentives for reducing the consumption or usage of plastic. Incineration is by default a linear system and does not assist the transition away from plastic or to a circular economy of cycled resources.

Industrial Recycling

As a means to recuperate used plastics, industry and government have encouraged and legislated consumer recycling of plastic over the last fifty years. Industrial recycling commodifies plastic on its material value. Various grades and purities of used plastic have different values. However, the grade of plastic is impossible to maintain with each cycle of recycling. With each cycle, the grade decreases, its value decreases and so too does the likelihood of it being recycled the next time round. Eventually, all recycled plastic is "down-cycled," becoming of insufficient value to warrant the industrial effort and drops out of the recycling system. Industrial recycling is thus not a closed circular process-- rather it is a a downward spiral resulting in all plastic eventually escaping into the biosphere.[29]

The Dangers of Plastic Degradation

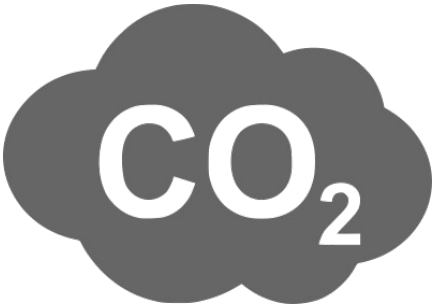
When plastic enters the biosphere it releases toxins, fragments into microplastics and emits greenhouse gases that interfere with ecological cycles.[30] When plastic is burned or incinerated, toxic gases like dioxins, furans, and polychlorinated biphenyls are released into the atmosphere.[31] Photo-oxidative degradation caused by exposure to ultraviolet radiation and physical abrasion fragments plastic debris into smaller and smaller particles, know as microplastics[32] The degradation process corresponds directly to the amount of surface area of the plastic that is exposed as well as the length of time of exposure to UV rays.[33] The majority of non-recyclable single use plastics

are sheets and films with large surface areas and are highly susceptible to photodegration. The photodegradation process also emits greenhouse gases, methane and ethylene.[34]

Increasing scientific documentation is demonstrating many dangers arising from plastic degradation. Microplastics can have possible direct ecotoxicological impacts, accumulate in food chains and cause economic damage because of food safety concerns.[35] Burned and incinerated plastics have been shown to release dioxins and other chemicals that are harmful to human health.[36] When C02 and greenhouse gases enter the atmosphere they have been shown to disrupt global climate stability.

Meanwhile, current research show a disconcerting effect of microplastics on the health of plankton and zoo-plankton. Planktonic eoosystems power the ocean's ability to sequester CO2. The photosynthesis that power the life and growth of plankton essentially captures carbon dioxide in organic matter. The death and defecation of plankton send this CO2 sinking to the bottom of the ocean where it is sequestered away from the atmosphere for centuries.[37] There is growing evidence that these plankton are ingesting ever greater quantities of micro-plastic debris with potentially significant impacts on their metabolism, reproductive success, and mortality rates[38]. Emerging scientific research indicates that this could compromise the ocean's ability to sequester C02.[39]

Carbon Credits & Trading



Carbon trading is an approach used to control and reduce greenhouse gas emissions (e.g. carbon dioxide, methane, ethane, etc.) by providing economic incentives for reductions in emissions. The underlying concept is to let the market decide and achieve emissions reductions most cost effectively, across industries and borders.

Carbon trading as a mechanism for this was implemented as part of the Kyoto Protocol, signed by 180 countries in 1997 to reduce their greenhouse gas emissions between the years 2008 to 2012.[40] A *carbon credit* is a term for any tradable certificate representing the right to emit one tonne of carbon

dioxide (or the equivalent amount of another greenhouse gas). Credits are issued to carbon-reducing projects under a stringent framework for authenticating the claims of C02 sequestration. The sale of carbon credits continues as a means to offset the carbon released during transportation of goods as well as industrial and agricultural activities. Accredited activities, like forestry projects, solar arrays and other enterprises that sequester carbon receive the funds from carbon credit purchasers.

Critics observe that the globalized carbon-trading market favors large-scale, corporate sequestration initiatives. The high transaction cost for verifying and authenticating carbon sequestration projects makes the participation and generation cost prohibitive for small scale activities and negligible for large, industrial projects. Big players then buy, sell and speculate with carbon credits on the global commodity market for profit, detaching the credits from their original purpose. This dynamic enables big players to continue and profit by legitimizing their carbon-intensive activities without incentivizing a transition. Most notably, the system does not incentivize and support small and micro-scale initiatives-- which collectively have a massive potential for carbon sequestration, regeneration and transition.

Critics also observe that the carbon trading system which enables large companies to continue their carbon intensive operations, fails to address the root cause of these business operation: individual consumption. The system fails to provide direct feedback and cost to the consumers making the choices that require the offsets in the first place.

The Advent of Bockchain and Cryptocurrency

The advent of blockchain and cryptocurrencies has led to a revolutionary new way to store value through the creation of an open, immutable, transactional record that transcends the need for third parties. Blockchains, such as Bitcoin, use an algorithm called *proof-of-work* to validate transactions on its network. 'Miners' do this work by committing computational resources to solve complex mathematical puzzles. When each puzzle is solved, it results in the authentication of a block of transactions. The miner is then allowed to add a new block to the Bitcoin public ledger or 'blockchain'. With each additional block the network then releases newly created Bitcoin and rewards

the Miner for doing this work.[41]

Critics point out that the work of mining coins has no intrinsic value. It is estimated that the current work mining Bitcoin consumes 50 terawatt hours of power per year.[42] In practical terms, this means that Bitcoin Miners use as much electricity as Switzerland, running computers to solve math puzzles[43].[44] As the calculations that are made have no practical or utilitarian value in and of themselves, miners must thus be remunerated separately (in the coin itself) for their work. Given the hardware and electrical costs in running effective 'mining rigs' the system favours those with access to capital and technology.

The Ecobricking of Plastic

Ecobricking is a simple, low-tech means of securing plastic into a bottle to make a reusable building block. Ecobricking is accessible to anyone -- all that is required is hard work, a stick, a bottle and plastic. Ecobricks can also be used by anyone. The applications of ecobricks range from simple stools using a dozen ecobricks, to gardens using hundreds, to structures using thousands. Unlike other forms of plastic management, ecobricking cannot be done by machines and requires an individual's work -- a process that raises ecological consciousness and, over the long-term, challenges an individual's plastic consumption.

The Terminal Minimization of Net Surface Area

By packing plastic into a bottle, the net surface area of the plastic is reduced a thousandfold. This *terminal minimization of net surface area* means that the plastic is effectively and indefinitely kept safe from all forms of potential degradation. Furthermore, by applying cradle-to-cradle building techniques, the ecobrick can be reused over and over.[45] In particular, the use of ecobricks in earth constructions to build local green spaces, or earthen walls is encouraged by the GEA[46] as a mean to

keep them safe from the main forms of potential degradation[47]. Ecobricks, in this way, replicate nature's system of sequestration in which prehistoric carbon laden biomass was stored under the earth, keeping the hydrocarbons out of the atmosphere, stabilizing climate and gifting future eras. In the same way, ecobrick earthen construction enables us to indefinitely secure plastic and its hydrocarbons from becoming toxins, microplastics or from reaching the atmosphere as C02. This sequestration service and the actual concentrated material are likewise a gift for future generations and eras. We estimate that for each 1 Kg of ecobricked plastic, 3.1Kg of CO2 is sequestered.[48]

No Capital or Societal Barriers to Adoption

As there are no financial, technological or skill impediments to adopting ecobricking, the technology has spread virally and exponentially over the last decade. The GEA estimates that there are now 10 million active ecobrickers in the world today[49]. As ecobricking spreads, so too does individual and collective questioning of the mechanism of plastic production and consumption. This continues to grow as awareness spreads of plastic pollution and the failure of industrial recycling.

The Raising of Collective Ecological Consciousness

"A problem has never been solved by the same consciousness that generated it."

- Albert Eintein

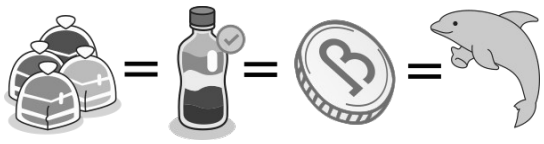
Ecobricking is unique among plastic management technologies in its direct influence on the consumers of plastic. By enabling individuals to take personal responsibility for their plastic consumption, the manual process of ecobricking compels a direct interaction with one's consumed plastic. The meditative and communal aspect of ecobricking catalyzes the raising of ecological consciousness[50] Ecobrickers tend to pursue more information about waste disposal in their community, plastic, recycling and ecobricking topics. This leads to a steady decrease in the ecobricker's net plastic consumption. Ecobrickers also tend to put their ecobricks to use in ways that embody cradle-to-cradle principles, exploring regenerative technologies and organic materials (building composters, gardens and food forests). The GEA emphasizes these principles and technologies, in particular the use of ecobricks for local, organic, non-capital earth building.

What are Brikcoins?

As the negative effects of widespread plastic pollution are becoming clear, individuals and governments are realizing that removing plastic from the biosphere is essential. Even more so; preventing it from getting there in the first place. Unlike traditional recycling, which values only the material value of plastic, Brikcoins are based on the ***absence of plastic from the biosphere*** or in other words ***sequestered plastic.*** Ecobricks enable the revolutionary quantification of this value.

Brikcoins are a manual blockchain, proof-of-work, complementary currency. By 'manual' we mean just that: requiring hands-on manual labour. Brikcoins are based on the ecobricked sequestration of plastic which can only be achieved through hands-on human work, packing plastic into an ecobrick. The Brikcoin system emulates the core elements of a cryptographic blockchain, but substitutes computation work with manual human work and cryptographic confirmation with community validation. Consequently, there are no capital or technological barriers-- aside from internet access and a stick.

By incentivizing manual work that results in value in and of itself (i.e. the creation of a useful and practical ecobrick) the Brikcoin platform removes the necessity of rewarding miners/ecobrickers with the currency itself (as Bitcoin and Ethereum platforms must) *as the work and community validation is the reward.* Specifying work that is non-petroleum-powered and non-capital-contingent enables the participation of anyone willing to put in the hard work to benefit their home, community and biosphere. By removing the direct rewarding of miners/ecobrickers, we likewise remove incentive for cheating at mining/ecobricking or manipulating the system. Furthermore, without a reward structure biased to economies of scale or to pre-existing capital, Brikcoins favor small-scale over large-scale participation.



Authenticated Plastic Sequestration

Plastic that has been properly packed into an ecobrick can be put to use as a building block that will not break down or contaminate the environment[51]. This plastic has been effectively and indefinitely sequestered. Brikcoins are generated when peers on the platform independently review (validate) an ecobrick and concur (authenticate) that the plastic has indeed been ecobricked to GEA standards. A block of Brikcoins are then generated on the GoBrik platform corresponding to the weight of the plastic and distributed to those ecobrickers who did the validation work (validators) and to the GoBrik central reserve.

Manual Sequestration Only

It is possible to sequester plastic (i.e. terminally reduce its surface area) through other means of compaction using machines, industry and capital. However, ecobricks, by contrast, are accessible anyone with a stick and a bottle. As they cannot be made with machines, they enable an unprecedented empowerment and support of individuals and communities, raising their ecological consciousness at the same time. Critically, ecobricking is dissociated from fiat capital and petroleum-powered machines and economy and thus also their intrinsic biases. Given the GEA recommendations for earth building, it is also most likely that the ecobrick will end up safely and securely under earth--unlike industrial compactions of plastic (bales, pallets, boards, etc.). Brikcoins are thus based only on *ecobricked sequestered plastic generated by human toil.*

The GoBrik Platform

The GoBrik platform serves ecobrickers around the world, enabling them to log, manage, validate, authenticate and exchange their ecobricks. Ecobricks that are logged on GoBrik are given an individual serial number and their unique data (weight, color, volume, density, maker etc.) is recorded and stored in the database. Once logged, ecobricks are automatically submitted to the validation queue where they are reviewed by the community of ecobrickers. Ecobricks that are successfully authenticated (three independent reviewers concur on the visible data) are then eligible to be exchanged and traded on the GoBrik platform. This allows the large numbers of ecobricks needed for structural constructions to be sourced and shared locally.

The Central GoBrik Platform to serve the Decentralized Ecobrick Movement

In order to fulfill the mission of the GEA, the GoBrik app was developed to serve the ecobrick movement. GEA founders long observed a connection between the concept of 'trash' and 'waste' and plastic pollution. In order to realize the GEA's vision of local and global plastic transition, the Brikcoin concept was developed as a means to give value and usefulness to otherwise valueless, non-recyclable and potentially toxic plastic. The GEA oversees the maintenance of Ecobricks.org, GoBrik.com and the Brikcoin technology.

How are Brikcoins Generated?

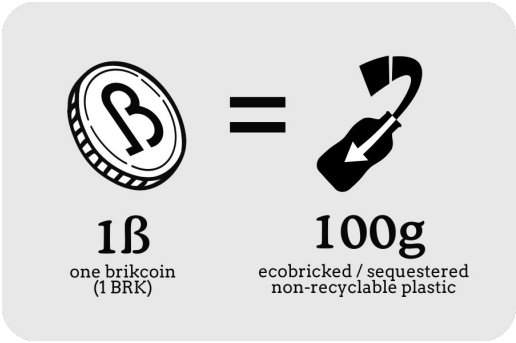
Manual Blockchain

The first part of the generation process is the making of an ecobrick. This time-consuming, labor-intensive process packs plastic tight into a bottle. Once complete, ecobrickers log their ecobrick on the GoBrik platform. A serial number is given by the system and the ecobrickers enscribes this permanently on the ecobrick. A photo of the ecobrick with the serial number is taken and the logging completed. The logged ecobrick is then automatically queued for review.

The GEA has defined standards for a properly made ecobrick. When a packed bottle meets these standards, it is considered an acceptable ecobrick. The second part of the process involves the work of the ecobricker community to ensure that each logged ecobrick does in fact meet the minimum standards of a good ecobrick. Any user on the system can review and validate ecobricks in the queue. Three independent validators review the ecobrick's photographic data to make sure that the ecobrick is made properly, meets GEA standards and is legitimate by answering a series of questions. An algorithm calculates a validation score based on the review. The three validation scores are averaged and if the average exceeds the minimum threshold, the ecobrick is authenticated. Brikcoins are then generated and issued to the validators and the GoBrik Central Reserve based on the weight of the ecobrick.

The Plastic Standard

The amount of Brikcoins generated depends on the weight of the authenticated ecobrick multiplied by the set plastic standard: ***100g of ecobricker plastic = 1ß.*** This is an arbitrary preset standard on GoBrik. For example, a 0.3 kg ecobrick will generate 3 BRK, while a 0.4 kg ecobrick will generate 4 BRK.



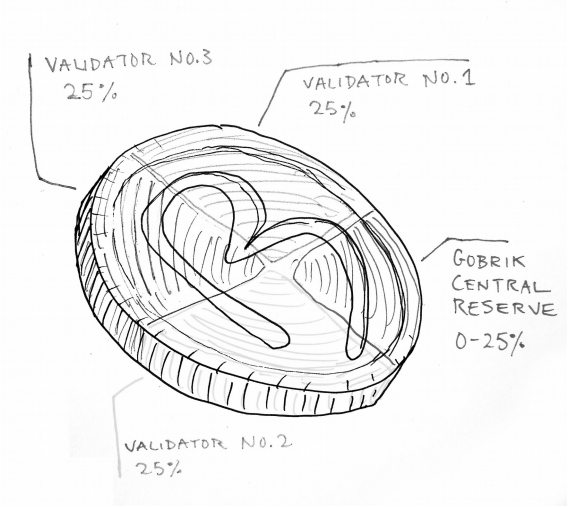
Validation Credits

It is important to note that only active ecobrickers can take part in the authentication process. This is assured by a system of validation credits. Validation credits are earned when a user's ecobrick is authenticated. Each validation that a user makes requires one validation credit. Without validation credits (i.e. without logging good ecobricks) the ecobricker quickly depletes their validation credits.

It is important to note that the maker of the ecobrick *does not receive* Brikcoins when the authentication of the ecobrick is successful. In this way the Brikcoin value of the ecobrick is decoupled from the generation of Brikcoins.

The Distribution of Brikcoins

Upon the authentication of an ecobrick, Brikcoins are generated and each of the three validators receives 25% of the total value of the ecobrick. The final 25% is sent to the GoBrik Central Reserve. Every transaction in this process is recorded in the public 'Brikchain'.



Authenticated Ecobricks can be Exchanged

GoBrik features a platform for exchanging ecobricks privately and publicly. Only ecobricks that are authenticated can be used in the GoBrik system for exchange. The owner of the ecobrick can use GoBrik to exchange, barter or sell their ecobrick. Ecobrickers can exchange their ecobricks for dollars, Brikcoins, cookies or whatever else they choose.

Full Chain Transparency

The Brikcoin system is 100% transparent and verifiable. The balance of every ecobricker on the system is publicly available and all transactions are logged and posted. Every Brikcoin that is generated on the system is logged in a chain of block transactions. This log is human searchable and legible using our platform's BrikChain Explorer. Anyone can view, search and filter the entire chain here at any time.[52]

Brikcoin: Token, Offset and Medium of Exchange

Unlike many crypto and fiat currencies, Brikcoins are grounded in real world value. Each Brikcoin is tied to the sequestration of 100g of plastic. As every BRK is directly linked to a quantity of sequestered

plastic, BRK becomes a means to value the removal of the plastic from the biosphere. This gives Brikcoin value in three ways:

1. Sequestration

Burning or incinerating 1kg of plastic or petroleum releases approximately 3.1kg of C02.[53] Plastic that is left to photodegrade in the environment releases greenhouse gases such a ethylene and methane.[54] This is to the detriment of planetary ecological harmony. Ecobrick sequestration prevents these harmful effects.

2. Token of Stored Value

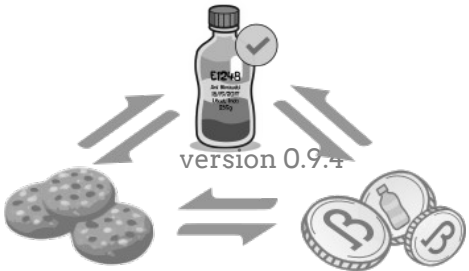
Each BRK is directly and permanently linked to a finite and scarce resource, in the same way that a banknote once referenced a gold reserve. As BRK can be exchanged between GoBrik account holders, Brikcoins become a token of stored of value. Over the next decade, as plastic production plateaus and ecobricking increases, the token value will become more distinct. This will be particularly experienced in towns and cities where ecobricks are adopted and as single use plastic is banned.

3. Medium of Exchange

With each token representing a fixed plastic value, Brikcoins serve as an ideal means to purchase and exchange ecobricks. Given that this exchange is geographically limited by the physicality of ecobricks, we envision that BRK will become a means for the exchange of other community goods and services.

Intrinsic Work Value Reward

Unlike traditional computational cryptocurrencies, the work in 'mining' Brikcoins is valuable, in and of, itself. In this way, there is no need to reward the maker's of ecobricks with Brikcoins. The entire ecobricking movement has thus flourished over the last decade without any need to reward or pay ecobrickers for the hard work of making an ecobrick. The sequestration and utilitarian value of the



ecobrick is sufficient.

The GoBrik platform thus does not issue coins directly to ecobrick makers. Instead, we augment the utility value of the maker's ecobrick by granting it 'authenticated' status. Only authenticated ecobricks can avail of the platform's exchange system. Only authenticated ecobricks can be bartered and sold on the platform. Although, this exchange value is not fixed, we believe that as the system grows, the market will set a value for authenticated ecobricks, thus increasing the incentive for ecobricking, logging ecobricks and making top quality ecobricks.

The Vision

Local & Global Plastic Transition

We live in the petroleum age. There is no way around plastic-- that which has been created and that which is on its way. Fundamental to the pollution crisis is the etymological judgment of used plastic as 'waste'. Were plastic seen as gold, it would not be discarded and allowed loose in the biosphere. Using sequestered plastic as a 'gold standard' for the basis of the Brikcoin currency enables just this - the blanket and universal valuation of plastic. By defining plastic sequestration uniquely to manual, human-powered and universally accessible ecobricking (*in which no fiat currency and no petroleum power are required*) we envision a leap in our planetary transition from petroleum, the detrimental biases of fiat capital and plastic.

We envision Brikcoins as a catalyst to deep local and global plastic transition. We envision Brikcoins as a complimentary medium of exchange, ideal for supporting, encouraging and igniting the spread of regenerative ideas and technologies that assist our return to an ever greener harmony with the cycles of life.

Sequestration of Plastics

We envision that the GoBrik and Brikcoin platform will remove millions of tons of plastic from the biosphere. We see this as an inevitable consequence of incentivizing the valuing of plastic that will ignite a collective mobilization to sequester both freshly consumed plastic and plastics already in the biosphere. In so doing, we believe removing this potentially poisonous plastic from the biosphere will prevent untold harm to and suffering of, humans and our fellow species for the next thousand years.

Ensuring High Quality Ecobricks

One of the current bottle-necks to building with ecobricks, is sourcing them and ensuring their quality. The labor and time involved in ecobricking makes it challenging for individuals to make the requisite number of ecobricks for large constructions. The dispersal of ecobricks in a region results in logistical difficulties for one party trying to source large quantities of ecobricks from many ecobrickers. It is also challenging to know the quality of other people's ecobricks makes it difficult to confidently exchange ecobricks publicly. We envision that the Brikcoin system will solve these problems and further ignite the spread of ecobricks and ecological consciousness. We envision that the GoBrik platform will inspire high quality ecobricks, peer-to-peer exchanges and large scale constructions.

GoBrik's authentication system is designed to provide personal and direct feedback to ecobrick makers from our community of experienced ecobrickers. The systemic rejection of poorly made ecobricks, hand-in-hand with peer-review, is encouraging ever better ecobricking.

Furthermore, GoBrik's third party, independent authentication creates the atmosphere of *trust* required for public and stranger-to-stranger exchanges. Only through such a system of exchange is it possible to mobilize the requisite number of ecobricks for large scale constructions.

With the official roll out of the GEA's Earth and Ecobrick Building Trainer of Trainer course in April 2019[55], we envision the GoBrik platform and Brikcoin system enabling and facilitating the work of community leaders in manifest ecobrick earth constructions.

A Decentralized Token on a Centralized Platform

We envision Brikcoin as a fully decentralized, ERC-20, Ethereum based token, that integrates with the GoBrik platform run by the GEA Earth Enterprise. This decentralized app ('Dapp") would leverage the best aspects of decentralized ledger blockchain and of a centralized not-for-profit Earth Enterprise to hold the space. Currently, version 1.0 of the GoBrik platform and Brikcoins are based on our database-driven app developed on a proprietary third party platform. Our road map involves migrating to a launch of Ethereum tokens that would correspond to our first phase of database development. Our

road map also involves mirroring the development of Gobrik v1.0 with our own fully coded native application (v2.0). The GoBrik app will then be a portal to the ERC-20 token and accessible through native iOS and Android versions.

In line with our vision of 'manual' crypto currency, we envision a distribution of copies of the Ecobrick database, done manually by ecobrickers around the world, to create a decentralized backup of ecobrick authentications and Brikcoin transactions.

Community Ecobrick Hubs for Local Currency Integration

We envision that the Brikcoin system and concept will be integratable integrate with preexisting and in-development community complimentary currencies. In this way, *Community Ecobrick Hubs* can receive ecobricks, which are then reviewed by assigned community volunteers. Each ecobrick is weighed, double checked and either rejected (returned to the maker) or authenticated (kept by the community) based on GEA standards, using the GEA system of triple validations or through community use of the GoBrik Platform.

Brikcoin Token Sales

Like any token or commodity, Brikcoins will establish their value in fiat currency. The GoBrik exchange platform facilitates the sale and barter of Brikcoins between users. The GEA is also developing a system for the purchase of Brikcoins directly from the GEA Central Reserve. Given that Brikcoins are based on sequestered plastic, the purchase of Brikcoins will serve as a plastic offset for those who wish to use fiat capital to encourage the removal of plastic from the biosphere.

Currently, 25% of each Brikcoin generated is credited to the Central Reserve. Only these Brikcoins will be salable as official plastic offset credits, on a dedicated portal on Ecobricks.org (Brikcoins exchanged between users, companies and on third party exchanges, will not be considered as offset credits).

The GEA's role, as a principled Earth Enterprise, is key to maintaining and developing the GoBrik platform. The GEA will serve as independent, non-partisan authority on ecobricked sequestered plastic. Revenue from Central Reserve Offset Sales would be directed to the GEA in fulfilling its mission and vision of supporting local and global plastic transition. Thus when companies and individual use fiat currency to purchase BRK it is an investment in the continued process of removal of plastic from the biosphere.

Brikcoin Genesis Sale

Our vision of sequestering millions of tons of plastic will require a true Earth Enterprise -- a collaborative orchestration of grand proportions. As such, the GEA is developing Brikcoins as a plastic offset token to fund the work ahead without comprising our principles of fiat-currency independence. Brikcoins serve as a buffer between capital economy and fiat currency, letting us operate in both the old and new worlds. To fund the GEA's maintenance and development of the GoBrik platform we are preparing a Genesis Sale of the first 100,000 BRK in three phases. The full details of the Genesis Sale, including ongoing sales and the terms and conditions of BRK sales will be published in a forthcoming document: *Brikcoin Genesis and Ongoing Sales – Terms & Conditions.*

The Brikcoin Development Team

Russell Maier – Lead developer, GEA Co-Founder

Russell Maier is a co-founders of the Global Ecobrick Alliance and has spearheaded the the spread of ecobricks in South East Asia and the UK. Russell's regenerative inventions, ideas and projects have been covered by the BBC, the Guardian, the Jarkata post, hundreds of local media outlets and recently an hour long special on CNN Indonesia. With almost two decades of web development experience, an academic background in philosophy and a decade of leading large collaborative projects, Russell is the catalyst behind the Brikcoin project. With a perspective gleaned from integrating in some of the most politically and economically challenged cultures on the planet -- from refugee camps in Gaza, rainforests in Costa Rica, to four years living with the Igorots in the mountains of the Northern Philippines, Russell brings to the Brikcoin team, his passion for solving ecological and social challenges with a low tech, regenerative approach.

Ani Himawati - GEA Principal, CDD Advisor

Ani Himawati is an Indonesian anthropologist who has worked to empower communities around the country in cities, towns and remote villages. For the last fifteen years she has worked simultaneously at the grass roots and executive level in the Community Driven Development (CDD) programs with NGOs, Government and Development Aid Agencies, such as the UN and the World Bank. Ani is one of the principals of the Global Ecobrick Alliance and has assisted in GEA Training of Trainers workshops all around South East Asia. She brings her first hand experience of CDD programs to the GEA team, as well as her development work experience designing nation wide implementation programs.

Stephen DeMeulenaere – Token Model Advisor

Stephen has over 25 years experience with digital currencies and 8 years experience with cryptographically secured digital currencies. Before the word 'Bitcoin' was coined, his contributions in the field of monetary design have been noted in dozens of books and magazines from "The Future of Money" by Bernard Lietaer to "The End of Money and the Future of Civilization" by Thomas Greco. Focused on the potential of how restructuring capital can solve environmental and social problems, Stephen has been a natural fit to the Brikcoin project, advising over the last two years. Previous positions include the organizer of the Blockchains for Sustainable Development for the UNCTAD World Investment Forum in Geneva, brand ambassador for the Malta AI and Blockchain summit and Asia Region Leader at Qoin - Smart City Currencies. Stephen brings his field and theoretical experience in complimentary currency design and implementation as a senior advisor to the Brikcoin team.

Leon Stafford – Server Configuration Designer & Manager

Leon is a veteran WordPress developer with extensive experience optimizing servers, sites and databases for clients around the world. Leon is the lead developer of the WP2Static plugin for optimizing site performance and security. Leon couples his IT ingenuity with his passion for solving plastic. In 2017 he joined the GEA Trainer team and has since been advising on the GEA server infrastructure. With the global awakening to the perils of plastic pollution, Leon has been instrumental in configuring a short and long term solution to seamlessly serving the exponential rise in traffic to Ecobricks.org and GoBrik.com.

Shiloh Vermaak – Senior User Experience Manager

A senior GEA Trainer based in Durban, South Africa, Shiloh brings her passion for solving plastic and her extensive experience with customer account management to the team. Shiloh's role is on the front lines of user interaction, managing the GEA social media accounts and interfacing with the various ecobricker movements and communities around the world. Shiloh manages the interaction between

our users, new team members and our technical team, ensuring we are constantly staying human friendly, relevant and engaging to the ecobrick movement.

Richard Goldsmith – Development & Deployment

With a combined total of over four decades of experience as a relational database designer, SQL developer, data-center manager and computer engineer, Richard brings to the GoBrik team his extensive background in financial and treasury systems development. After leading Sybase database and software development teams for Morgan Stanley, Fidelity Investments, Prudential Banking and other multinational BlueChip enterprises, Richard retired from the financial industry keen to re-invest his energies and skills in endeavours that fully resonated with his values. With a deep passion for the earth as a long-time green party member and climate advocate, Richard was one of the early adopters of ecobricking in the UK as a means to supplement his already 100% renewable energy home in Surrey. Richard's passion, background and skills now merge as he assists the team establish development protocols for GoBrik and Brikcoin platforms.

Appendix

Earth Enterprise Principles

See the full Global Ecobrick Alliance Earth Enterprise for full context.[56]

1. ***Right-Purpose:*** Our work is focused on solving plastic pollution through the raising of ecological consciousness and prevention. Plastic is one of the defining issues of our time which unites us across borders and traditions. Our work is dedicated *to our Children, our Children's Children – and the children of all species, for all time.*

2. ***Open Source:*** All the GEA's official resources, guide book, illustrations, videos and content, are all available to the world, to be used by anyone and improved by anyone under the Attribution, Share Alike, Creative Commons License.

3. ***Mandalic Collaboration:*** The operation of our enterprise, of our core team and of each member embodies the principles of mandalic cooperation theory[57]. In this way the GEA holds the center space, core intention and principles of the unfolding global ecobrick movement.

4. ***Platonic Emancipation:*** We involve and encourage attraction and passion-based partnerships in our enterprise. The enterprise recognizes and encourages gender balanced synergies.[58]

5. ***Ayyew Regenerative:*** We ensure that all our processes, products and projects are regenerative. This means that they embody cradle-to-cradle and ayyew principles in all our processes, products and activities and sequester more CO2 and plastic than they create. This way we ensure our harmony with earth's cycles is ever growing more green.

6. ***Equitable & Open Books:*** All of our financial records, including Brikcoin blocks and transaction, are 100% transparent. A live feed of our financial transactions (income and expenses) is publically visible and searchable on our site[59]. A full chain of Brikcoin block

generation and transactions that is human searchable and readable is available on GoBrik.[60] GEA staff salaries are established in a wage bracket to maintain a defined ratio from the highest to the lowest paid person in the organization.

7. ***Not for Profit:*** No individuals or shareholders will profit from the operation of the enterprise. At the end of the year, any profits or unspent funds will be reinvested back into the fulfillment of our mission and vision.

Glossary

Authentications: The conclusion of three validations on the GoBrik platform by independent ecobrickers who have not made and do not own, the logged ecobrick being reviewed. The authentication can either be positive ("authenticated") or negative ("rejected"). A successful authentication results in the creation of 1 BRK for each 100g of ecobricked plastic.

Brikcoin: A plastic offset token representing the sequestration of plastic by ecobricking. Each Brikcoin (BRK) represents the sequestration of 100g of plastic.

The BrikChain: A live, searchable and public repository of all transactions, blocks and authentications on the GoBrik platform connected to the creation and exchange of Brikcoin.

Brikchain Explorer: A page to explore all the transactions and blocks created and recorded on the Brikchain.

Central Reserve Fidelity: The measure by which the net total of Brikcoins (user balances + central reserve balance) matches the amount of plastic sequestered (total Kg of authenticated ecobricked plastic on GoBrik), as per the Plastic Standard. It is similar to the ratio of which gold reserves supported a gold standard currency's money supply. The Brikcoin money supply, central reserve balance and fidelity are tracked live on the GoBrik Platform.

Ecobrick: A reusable building block created by the packing of used plastic to a set density into a PET bottle.

Ecobricker Community: The collective of users with GoBrik accounts on the GoBrik platform logging and validating ecobricks.

Ecobricking: The collective acts of collecting, segregating, packing, logging and storing an ecobrick.

GoBrik: The platform created, maintained and developed by the Global Ecobrick alliance to log, store and authentic ecobricks and to maintain, manage and exchange Brikcoins and ecobricks. The platform is found on the URL https://gobrik.com and is also embedded into the Ecobricks.org site.

The Global Ecobrick Alliance (GEA): The GEA is an Earth Enterprise focused on solving plastic locally and globally by maintaining the physical, digital and intellectual infrastructure that serves the global ecobrick movement.

Manual blockchain: A database system modeled after the block chain cryptography concept of 'proof of work', where computation work is replaced with human work and computational 'proof' is replaced with community validation and authentication. This concept is being pioneered by the GEA in the GoBrik platform.

Validations: The act of review by an ecobricker of a logged ecobrick on the GoBrik platform.

End Notes

1 The Global Ecobrick Earth Enterprise Alliance Intention Map
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3 Earth Corporation concept was coined by Mark Donoan - http://earthcorporations.com/about/
4 *How on Earth: Flourishing in a Not-for-Profit World by 2050*, Donnie Maclurcan, Jennifer Hinton, Post Growth Publishing (first chapter issued for book's kickstarter supporters)
5 Roland Geyer, Jenna R. Jambeck and Kara Lavender,'*Production, use and fate of all plastics ever made',* (Science Advances 19 Jul 2017: Vol. 3, no. 7, e1700782)
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8 *"The first principle of permaculture: The problem is always the solution"* Bill Molison, Permaculture One: A Perennial Agriculture for Human Settlements, 1978
9 Why Ecobrick? Www.ecobricks.org/why
10 Sequestration: "to keep safe and secure" Originates from Old French *sequestrer* or late Latin *sequestrare* 'commit for safekeeping', from Latin *sequester* 'trustee'. The term is also used in reference to carbon credits, i.e. "C02 sequestration"
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51 It is important to note that ecobricks that are not made properly, which don't attain GEA standards of density and technique, do not result in effectively sequestered plastic. Weak, light, 'squishy' ecobricks are not ideal for constructions and break down over time.

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This document has been developed by the Global Ecobrick Alliance using the latest available scientific research and statistics on the environmental impact of plastic. This data is currently evolving at a rapid rate and directly impacts the fundamental assumptions of this document. To ensure the latest version check our site:

www.ecobricks.org/brikcoins

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