EmpowerChain

Digital Infrastructure for a Circular Economy

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Keywords:

Empower: Company author of this document.

EmpowerChain: Blockchain created by Empower. Digital, decentralized infrastructure for the circular economy as a publicly owned good.

Emp: Pronounced "emp", the incentive token for Empower's incentive scheme. Its leading utility functions as a currency in exchange for goods and services.

MPWR: Pronounced "empower", The native network token for EmpowerChain. It is the governance coin of the EmpowerChain Blockchain. Holders will be able to stake it and pay transaction fees with it.

Circular Economy: An economic model of production and consumption which involves sharing, leasing, reusing, repairing, refurbishing, and recycling existing materials and products as long as possible.

PCRD: Pronounced "piciardis", the abbreviation of "Plastic CReDit", are credits used for (among other things) plastic footprint offsetting.

Proof of Real Work: When obtaining a PCRD, it will contain information about plastic waste, which people made the human effort to collect. This is literal proof of actual work that has already taken place.

Abstract

In communities across the globe, plastic has become an instrumental product in our daily lives. Plastic is a far-reaching and corrosive material yet abundantly used in nearly every aspect of the consumer lifestyle. Nevertheless, most of the plastic we use is in single-use products that have accelerated global waste production alarmingly; as plastics become more commonplace in households, plastic production and waste soar.

On scale, we contribute to roughly 448 million tonnes of non-recycled plastics that remain in our ecosystems and inevitably break down into harmful microplastics when left untreated [1]. The accelerated rate of global waste production highlights the inefficiencies in existing markets for recycled plastic and signals fundamental inconsistencies concerning global resource management. It is increasingly prevalent that the systems we use to manage our resources must undergo a complete transformation to a circular economy.

Plastic has a detailed history as one of the most widespread and costly problems in the global pollution crisis. As a result of the inefficiencies in traditional markets, we introduce EmpowerChain and its native $MPWR token, our tried and tested blockchain for a circular economic model that revolutionizes profitable plastic waste removal.

The Empower token is designed to simultaneously remove plastic from our ecosystem and prevent it from ever getting there in the first place. The EmpowerChain whitepaper exposes the technical rationale supporting the creation of the Empower Token, its native plastic passport, and its involvement with the Cosmos Ecosystem. Though existing plastic removal technology is essential, it is insufficient to alleviate plastic's strain on our ecosystems. The EmpowerChain is a blockchain-based ecosystem for the circular economy and is a well-suited free-market solution leveraging the Norwegian system for recycling at scale. At Empower, we believe implementing circular economics is structurally vital to depleting non-recycled plastics in the environment.

Introduction

Annual production of virgin plastic

Data from [11]

Plastic plays an undoubtedly vital role in our daily lives. Because of its wide range of utilities, industries across the globe have become addicted to it. Plastic is affordable, durable, and tremendously versatile - making it ideal for international production. Whether through revolutionary innovation in medicine with life-saving devices, strides in aerospace travel and technology, or supply chains and transportation - plastic is too great of a material to sacrifice. However, the overuse of plastic has evolved into a real issue. Plastic dependence increased from roughly 2.3 million tonnes per year in 1950 to 448 million tonnes in 2015. This sharp uptick of 200x in plastic production in less than 70 years will double by 2050 [2].

In recent years, a handful of countries in the European Union and the United Kingdom have passed new legislation taxing virgin plastic as a signal of support for more recyclables [12]. This

new legislation has resulted in over 400 extended producer responsibilities regulations, making producers more accountable for their business operations by incorporating the cost of waste and recycling into the bottom line. This strategy effectively aims to mandate every plastic producer to increase the rate of recyclable content in their products. Such regulation has limited widespread success because the traditional infrastructure in the world's economy is built for extraction, not regeneration. Global enterprises will need to redesign their products and value chains with open-source, decentralized technology and comprehensive data to initiate this transformation.

Fortunately, one of the advantages of plastic production is that it can easily be recycled and reused for future consumption. However, recycling plastic comes with particular challenges. For example, materials need to be deposited and collected to be recycled. This constraint requires infrastructure and incentives that currently do not exist at a scale large enough to address demand.

It requires a structural economic transformation, often called a circular economy, that aims to recycle and regenerate natural resources. In contrast, our existing model, the linear economy, implements a use and throwaway - encouraging extractive systems for global production.

So when we look for a solution to plastic waste, we need to look for one that solves the main bottlenecks:

1. Incentivized plastic removal in an equitable manner
2. Transparent data management that reveals pertinent processing information
3. Scalable and replicable system to fit markets of all shapes and sizes

These three pieces are fundamental to working on an adequate solution. Moreover, these principles are cornerstones of the EmpowerChain mission. Our core tenets are that members must remain incentivized to continue playing their role in creating and maintaining the circular economy. We reaffirm that data must be handled appropriately so plastic waste can be collected, transported, and processed most effectively. Ultimately, once scalable, the EmpowerChain governance network can quickly adapt to changes and add additional enhancements to improve the protocol's efficiency in dealing with potential future issues.

An Idea: A Circular Economy Based on Recycling

As previously established, the current economic model permanently removes materials for single-use products with short lifecycles. This model systematically compels extractive production and unsustainable consumption. On the other hand, the Circular Economy in sharing, leasing, reusing, repairing, refurbishing, recycling, and other activities that restore existing materials and products for as long as possible, thereby extending the product life cycle of consumer goods.

Ideally, the circular business model extends the linear model by cycling, extending, intensifying, and dematerializing material and energy loops to reduce resource inputs, waste, and emission leakage simultaneously. These implications aim to increase the amount of plastic recycled, extend the product life cycle as much as possible, and transition from a closed-loop chain to a circular supply chain.

In practice, circular economics implies reducing waste to a minimum. When a product reaches the end of its life, its materials are kept within the economy wherever possible. These materials can then be productively used repeatedly, thereby creating added value.

This departure from the traditional, linear economic model is based on a take-make-consume-throw-away pattern. The model relies on large quantities of cheap, easily sourced materials and energy.

In March 2020, the European Commission presented the circular economy action plan to promote more sustainable product design, reduce waste, and empower consumers by creating a right to repair [10]. There is a focus on resource-intensive sectors, such as electronics and information consumer technology, plastics, textiles, and construction.

The added value creation of the Empower circular model is reflected in three pillars, including social progress, economic growth, and environmental stewardship. To achieve social progress and address our first pillar, Empower aims to embrace informal groups to improve their welfare, particularly in developing nations. Economic growth means that Empower's sustainable business model can consistently bring value to the plastic industry and create value for recycling stakeholders. The third and most ambitious pillar is committed to environmental governance, e.g., reducing the flow of more plastics into the ocean and captivating innovations in ecological stewardship. These intersectional concepts are inseparable and at the core of the Empower circular business model.
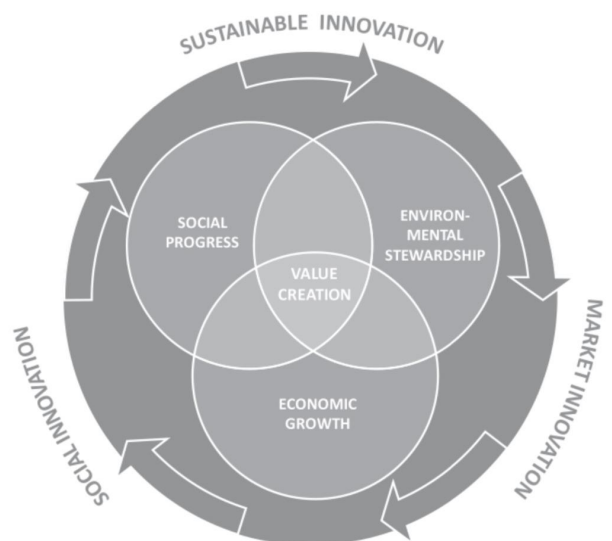
Empower

Empower was founded in 2018 on the idea that we can solve the plastic waste problem by giving plastic waste a fungible value.

Based on the same philosophy as the Norwegian bottle deposit system, Empower has been helping collect plastic waste, recycling and reincorporating it to reuse it while rewarding the people involved. Its goal aims to stop the leakage of plastic into the environment and cost-efficiently incentivize the collection of leaked waste.

After a year of pilots in more than 15 countries, we had learned that the problem required a more systematic approach. We started building digital infrastructure, a platform for tracking plastic waste. The platform, combined with different incentive schemes have been used all over the world to increase the value of collected materials.

Empower does not take ownership of collected materials or data but helps the local collectors get funding for cleanups and match with potential buyers of materials. Our methodology creates local waste collection infrastructure and entrepreneurs, ownership, and sustainable jobs within the waste management industry.

Empower has been the fastest growing collection network globally by empowering local collection and segregation at sources anywhere. We are creating the foundation for a global decentralized waste collection system with users in over 60 countries and with 5-15 registered organizations per week.

Empower: A Case of Success

With four years in the market applying the proposed methodology, Empower has been helping collect plastic waste, recycling and reincorporating it to reuse it while rewarding the people involved. Because of this reason, it has accomplished many achievements:

- Empower has reached 15,000 tons collected and registered on the platform.
- In February 2022, we did for the first time have users on all continents, adding South America and users in Brazil to the list, truly creating a global ecosystem and foundation for scaling up and building a broad and impactful community of changemakers.
- Selected as a Top 5 Global Company utilizing blockchain technology to create a circular economy and highlighted as a Global Best Practice program the solution to the Sustainable Development Goals at EXPO2020 Dubai.
- Empower has also developed its blockchain infrastructure with the launch of the mainnet in 2022. Our blockchain is open source and available for third-party use and integration, allowing others to build upon Empower and accelerate similar use cases for other materials shifting towards a world without waste even more by crowdsourcing new solutions based on disruptive infrastructure.

- 140 organizations registering materials to the Empower platform via around 500 facilities
- More than 50 organizations registering more than 50 tons
- Registered collection from more than 40 countries
- \> 3000% growth in volume from 2020 to 2021
- Estimated collection capacity in 2022: > 300,000 tons across every continent
- Growing collection capacity to more than 1 million tons by the end of 2022
- Aiming for the EmpowerChain to connect more than 100 million people in 100 countries directly with DeFi and the Cosmos Ecosystem by 2025

And obtained the following awards and recognition in fighting the global waste problem:

- Refi DAO NFT Hackathon under the category "NFTs that help restore ecosystems" 2022
- Sustainability Champion of the Year, FinTech AbuDhabi 2021
- Top 5 blockchain-based Circular Economy companies in the World, StartUs Insights 2021
- Leading 25 Global Best Practices Solution to the UN Sustainable Development Goals showcased at EXPO2020 Dubai in 2021-22
- Top 50 sustainability companies to watch, CleanTech Group 2021
- Selected for SAP.iO program 2021/22
- World Economic Forum TopLink Innovator
- Member of UN-Habitat Waste Wise Cities
- Founding Member of Kenya Plastic Pact
- EY Amplifier startup 2022
- IPCIC / Incubation Network solution to plastic waste in Indonesia 2021
- Google Startup SDG partner program
- European Social Impact Competition - Impact Prize Winner 2020
- Xynteo Exchange Impact Award Winner 2018

The Solution: EmpowerChain and the Empower Circular Economy

Empower has proven that we can tackle this large and complex problem in a very human way with suitable tools and systems in place. But for the solution to scale to a global level, it needs to

be decentralized and benefit the most crucial stakeholders: the people who use and collect the waste.

The Empower Platform, which is currently in place, provides many of the initial tools needed but lacks a decentralized solution - enter the EmpowerChain.
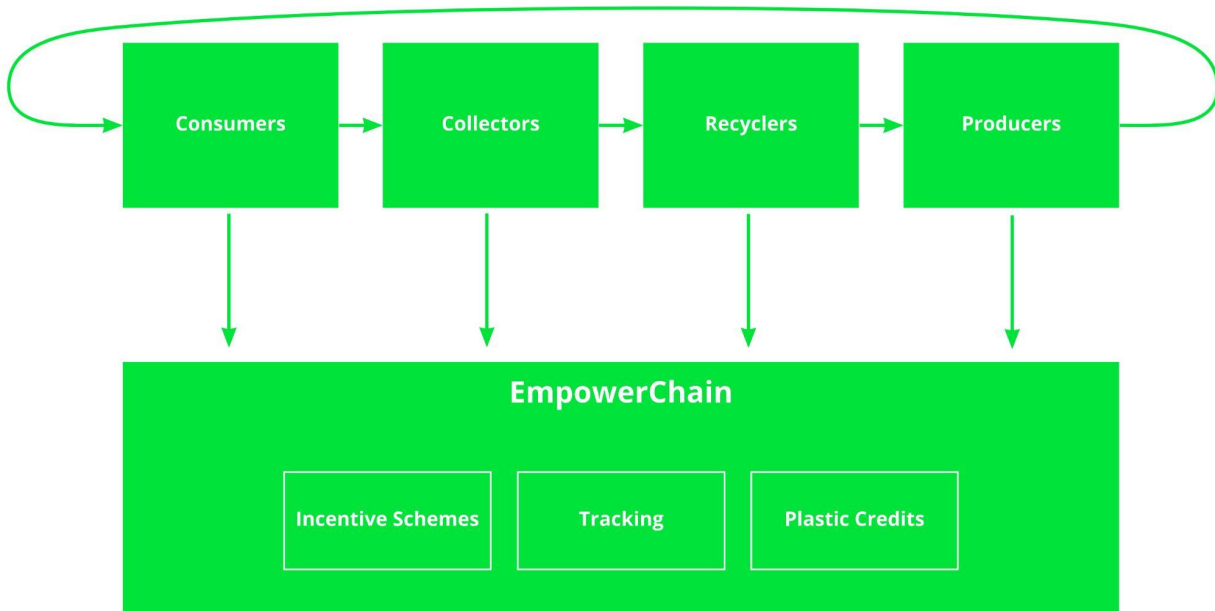
A circular supply chain needs different tools, EmpowerChain aims to provide them

We envision an ecosystem where anyone, anywhere in the world, can set up the necessary tooling to start a collection, tracking, recycling, and reusing waste (materials!). The network will allow the different actors to collaborate and distribute incentives and upside fairly.

The EmpowerChain is a fully decentralized, open-source, and public blockchain that aims to provide appropriate incentives to enable the collection and segregation of plastics at the source, anywhere in the world. The EmpowerChain network accomplishes this through on-chain applications (or "modules") for deposit schemes, plastic credits, and tracking.
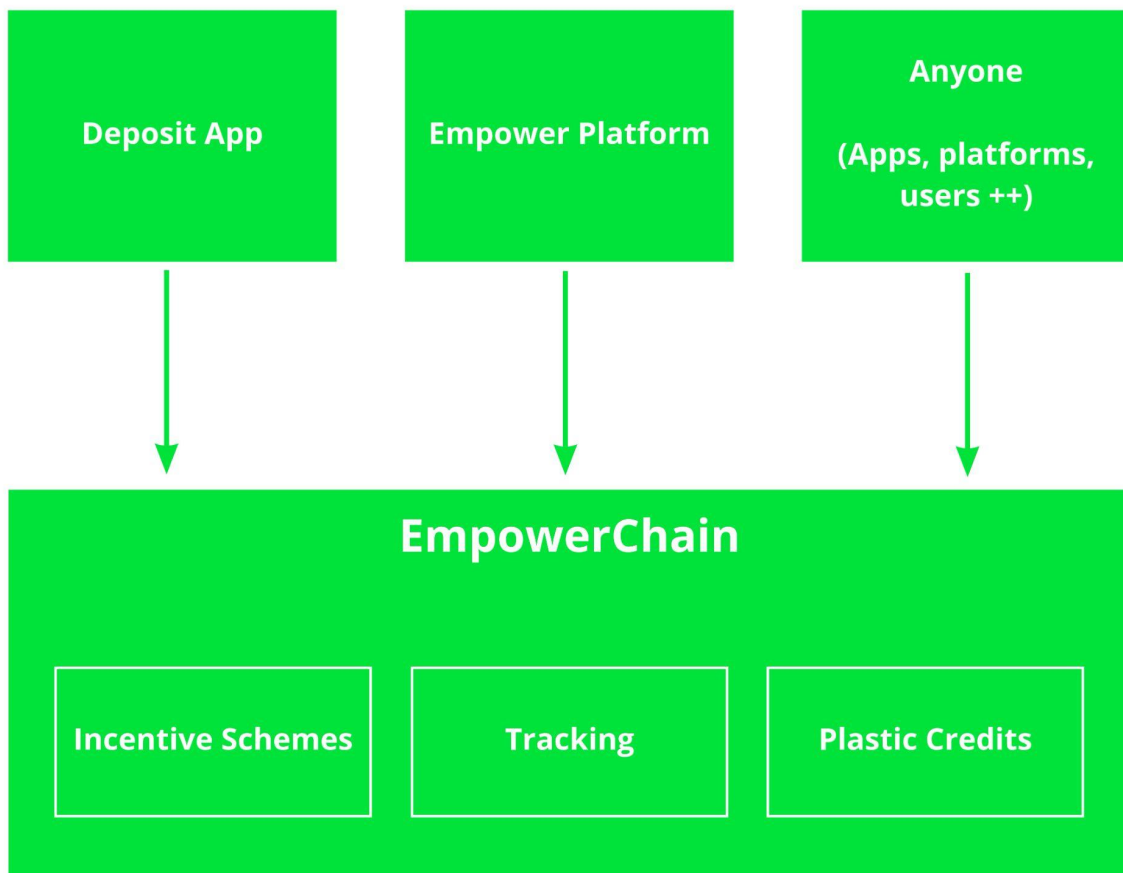
The EmpowerChain will be a public good that can be used by anyone

Our goal is to create infrastructure available for anyone, not just the Empower organization. We aim to create a public good, a network owned and governed by the ecosystem of waste management and the Cosmos community. Anyone ought to be able to build tools and systems on top of the EmpowerChain to help bring about the circular economy. As such, the EmpowerChain will be open, permissionless, and governed by the stakers in the system. For more details on this, see the Tokenomics section.

Blockchain & the Cosmos Ecosystem

There are several reasons why this project fits naturally with blockchain technology. Our blockchain is backed by an open-source code, available to the community in any part of the globe, generating neutrality and not giving an advantage to any agent involved in the network. It is not owned by any single entity, giving us the possibility to decentralize and democratize a public good truly.

Furthermore, open-source technologies require transparency so that everyone reads the software's established rules governing the token. In addition, it is only possible to change the blockchain if most of the stakeholders agree. This allows network improvements and other code enhancements to be developed by anyone, not only the original core team, letting the door open to a possible quick organic development growth without forcing the community to do it.

Also, staying in the line of the coding, the Cosmos ecosystem has grown very positively with regards to interchain operability [8], updated code [9], and tools developed. This gives functionalities that can be implemented faster in the new blockchain since they have already been tested in other projects.

Finally, since there is an essential need to streamline transactions to pay the waste pickers worldwide, we need a technology that supports peer-to-peer operations in the easiest and most efficient possible way. Cosmos Ecosystem helps solve this problem with intrinsic low transaction fees, unlike other networks [6,7].

Choosing the Cosmos ecosystem as the appropriate software to work with has several reasons:

- **Cosmos SDK.** The framework to get involved in this ecosystem is one of the best frameworks for building application-specific blockchains. $MPWR will require modular applications for its proper development.
- **Scalability.** At first, the $MPWR blockchain will require another on-app token: $EMP. This is just the beginning, and we expect the project to grow with time, so we need technology that will be able to work in the long term.
- **Interoperability.** There is a vast interconnection between most of the blockchains developed in the Cosmos Network through several Dapps (osmosis, junoswap, demex, etc.). This interconnection lets us work better with the rest of the community, making it easier to reach prospective investors.
    - Easy such as connecting to existing and upcoming services in the Cosmos Ecosystem
        - Decentralized finance

- - Insurance
  - Marketplaces
  - The general crypto ecosystem through bridges to Ethereum, Bitcoin, Solana, etc.
- **Proof of stake method.** Blockchains developed in Cosmos are proof of stake. This method is less energy-expensive and doesn't require as much computing power, implying it is more environmentally friendly than Proof of Work [3].
- **Smart Contracts.** Cosmos SDK has a module explicitly dedicated to smart contracts: CosmWasm [4]. This will help develop Dapps to incentivize the users who want to get involved in the recycling process.

EmpowerChain: Digital Infrastructure for a Circular Economy

There are many different needs in a complex supply chain, especially one transitioning towards a circular economy. That is why there is no single solution. You need a set of different solutions that all can work together. EmpowerChain unveils a class of applications that incentivizes the parties correctly and lets them collaborate. EmpowerChain is a tailored blockchain network to support the circular economy and equal opportunities for the stakeholders of a global decentralized waste management ecosystem.

Blockchain technology has the idoneous mechanics to build this upon because it allows for a trustless and lock-in-free platform where ownership can be shared. It also provides for the never-before-seen distribution of incentives.

Different stages in a supply chain require various tools and incentives for a circular economy. There need to be direct incentives for consumers or waste pickers to deliver their waste in the collection stages. Producers and manufacturers need data for storytelling and compliance with upcoming regulations (e.g., the EU tax on virgin plastics). Impact investors also need data and access to clean and direct channels for investing (e.g., plastic credit offset).

EmpowerChain is the underlying infrastructure that unlocks the potential of the circular economy. Through incentive schemes, plastic credits, immutable tracking data, and more, it lets a group of stakeholders make the shift to a circular economy. This series of points makes the agents compromise with the idea and strengthens the interest and the continuing in this circular economy.

EmpowerChain helps us move forward and abandon the lazy and contaminating life cycle we use for our plastic products:

To a sustainable process where all the involved agents receive a benefit for belonging to the cycle backed by the EmpowerChain, transforming plastic of single-use into a material with value that fuels the circular economy
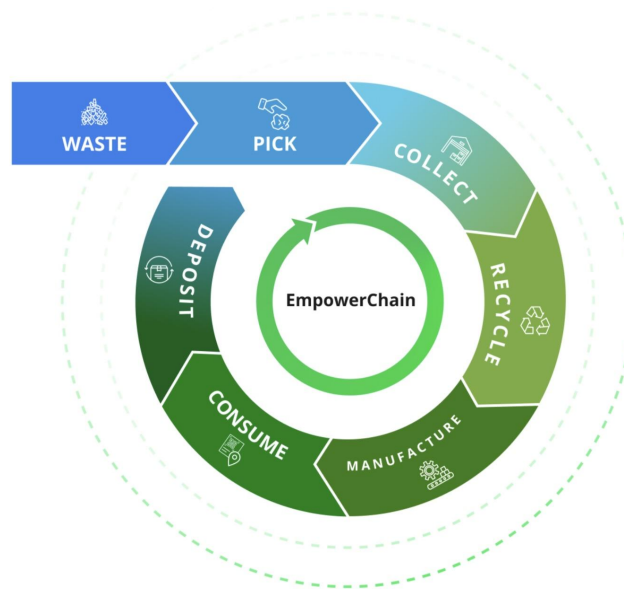

The Applications

Below we describe the initial mechanism, or modules, that we are building on EmpowerChain. Each covers a different but essential and complementary part of the circular economy.

Tracking stage 1: Proof of existence

The traceability aspects of the circular economy are crucial, and one of the cornerstones of this is reliable data. There will be a lot more work to make tracking data more visible and have trustless mechanisms for verification, but the initial step is to make data immutable.

Proof of existence is a combination of a well-known cryptographic technique called hashing and the immutability of a blockchain. When you hash a piece of data (such as a tracking data point),

you get a string back that you can use to prove later that the same part of data corresponds to the hash. This is commonly used in, for instance, authentication schemes to prove that you know a password without the receiver storing the password themselves.
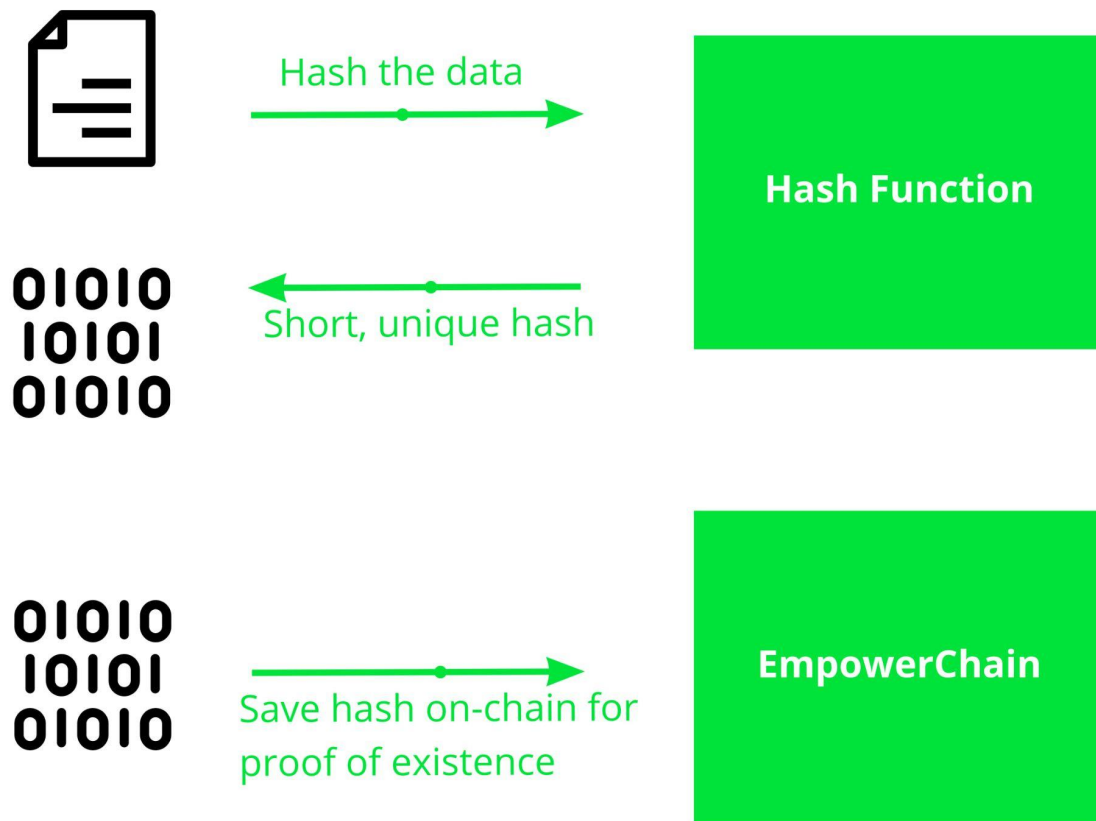
By uploading a hash of a tracking data point on the EmpowerChain, anyone you later share that data with can go to the blockchain and verify that this piece of data existed at a particular time and has not been modified afterward.

EmpowerChain

Given a proof of existence

Hash Function

Hash the data

Short, unique hash

**If the two hashes are equal,
the data existed at the time the hash was added on-chain**

01010 10101 01010 **=** 01010 10101 01010

This is only the starting point to traceability and verification of tracking data on-chain. We will also have a privacy-enabled marketplace to buy and sell data in the future.

Collection incentive schemes

The EmpowerChain will enable bespoke deposit systems for anyone interested in collecting materials or products through incentives. Some examples include:

- Extended Producer Responsibility (PRO) organizations that need to get back products, packaging, etc., after it has been used.
- Organizations that need materials can set up a deposit system to incentivize collection and aggregation at the source to get clean waste streams.
- Producers want to get their products back after end-of-life for recycling, consumer engagement, etc.
- Sponsored volunteer deposit systems for cleanups, like the Empower Deposit system, where anyone can donate to clean up anywhere.

Incentive Scheme

Owner

Token

Verified Collection Points
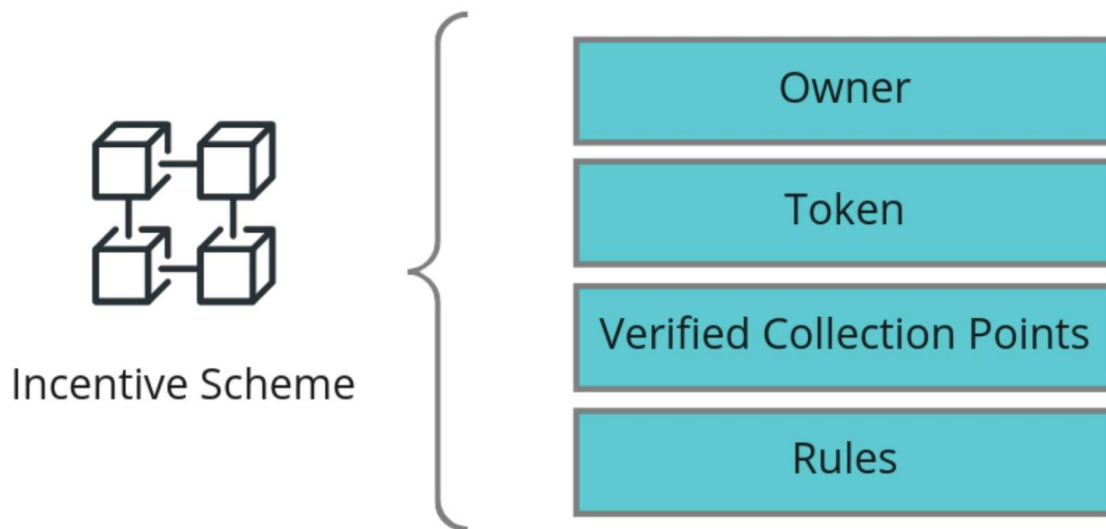
Rules

A deposit system is a set of rules, actors, and incentives that can be configured to work in whichever way is needed. Examples include which organizations are allowed to accept deposits, what type of materials or products, when incentives are paid out (e.g., after multiple steps of tracking, etc.), etc.

The deposit systems create incentives for those holding plastic waste to avoid mixing and contaminating materials. With efficient incentives and accessible collection, we can segregate millions of tons of plastic at the source, keeping more than 200 billion dollars in the economy, fueling sustainable jobs, and waste collection.

Incentives can both be monetary or gamification-based. They can be paid out in cash, vouchers, credits, or tokens. The goal is to cater to various incentive schemes and ensure that it is helpful for people all around the world.
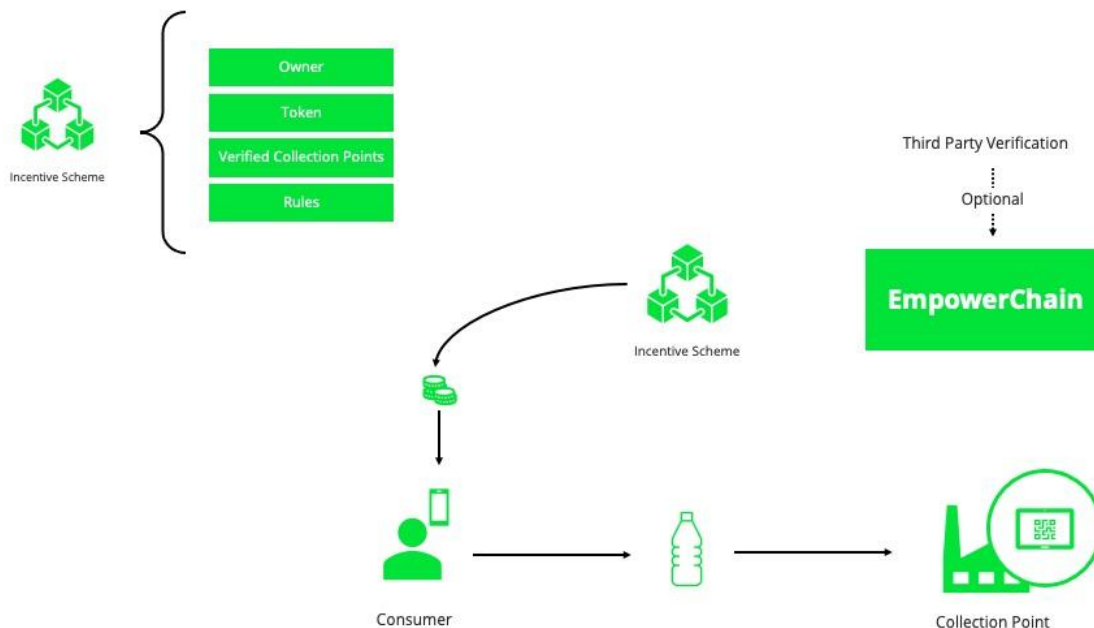
Empower Deposit Coins (EMPs)

The first collection incentive scheme to be deployed on the EmpowerChain is the EMP deposit scheme by Empower.

With the collection of plastic, people will be able to acquire proof of actual work. This is the idea behind an Empower Coin (EMP). This token is the way waste pickers and people doing segregation at source can earn directly from people wanting to offset their plastic footprint without going through middle-men for cashing in, genuinely creating the possibility to now support waste collectors that have a real measurable impact, both environmental and social.

The EMP token will be the native currency inside the Deposit App, having functionality to be used in exchange for other goods, services, and tokens. This token will have inherent value as a tool to crowdsource a global plastic waste cleanup and provide granular data on waste collection and create a decentralized waste collection network.

With the EMP deposit scheme, we want to empower anyone to set up a collection point, start collecting plastic waste and incentivize the crowdsourcing of waste collection and segregation at the source supplying the collection points. Notice that Empower does not set up a collection

point, but they have to be verified by Empower to become one. Anyone anywhere can set up a collection point and go through the verification process on the Empower Platform for free, becoming a piece also owned by the community. There are collection points in more than 40 countries worldwide, and we're aiming to reach 100 in 2023.

EMP Tokenomics

Empower tokens will be used like any coin: in decentralized exchanges, stores, and other Dapps that accept it, letting the possibilities for its usage open to a wide variety in the future. By burning EMPs, businesses can earn "plastic credits," a cost-efficient product that will offset their footprint, involving them in the plastic fight and supporting a global plastic waste cleanup movement.

The monetization of collection data will also support the value of EMPs. Using EMPs as a waste collection incentive provides granular data on waste collection location, regularity, volumes, types, and other data that today are almost impossible to get hold of. This anonymized and aggregated data will be made available to stakeholders needing data to provide waste management services and infrastructure. The fees will go to buy back and burn EMP, giving the value back to the individuals contributing to the global cleanup.
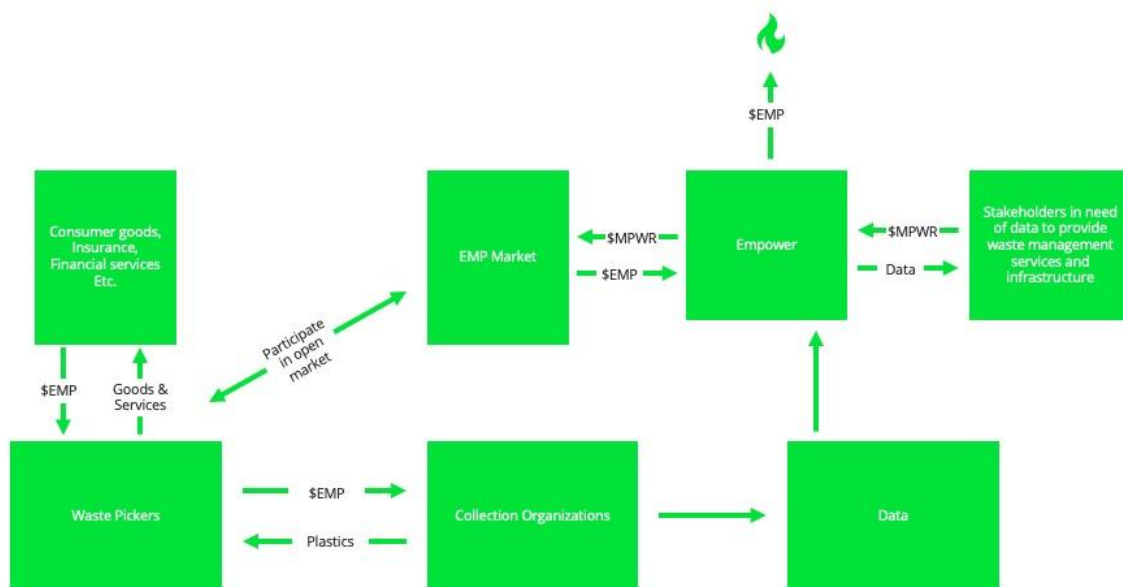
The tokenomics behind the EMP token have an inflationary-deflationary process relating to the amount of plastic waste reached per quarter. It will start with an inflation of 24%, and each

quarter will be updated, depending on a goal of plastic waste collected by the blockchain community.

First, considering the previous year's plastic waste collected by the blockchain, we divide it by 4 to get our quarterly forecast for plastic waste production. (The value that will be used during the first quarter will be the amount of accumulated plastic waste by Empower)

- If the blockchain contains the plastic waste goal of ±0.5% during the current quarter, the inflation of EMP will decrease by 2.5%. If the whole year the blockchain reaches the destination of plastic waste collected, the fourth time the goal is reached, the inflation will reduce an additional 2% bounty, reaching a total of 12% per year if the goal is reached.

- On the other hand, if the collected plastic waste isn't enough during a quarter, inflation will increase by 3%. If the whole year the blockchain doesn't reach the goal of managing plastic waste, it would increase its inflation by 12%, being a literal counter to a year of complete deflation at the end of that year.

The inflation rate will always settle between 10 and 60 percent. This means that even if the inflation has to decrease more than 10%, it won't, but it can increase next quarter because of the other condition, and in the same way, it can't inflate more than 60% but can decrease.

Deposit Application

The first contact of collectors and consumers with the EmpowerChain blockchain will be with the Deposit App. An all-in-one app that will work as a digital wallet where the users will be able to manage their assets and NFTs belonging to the EmpowerChain blockchain with the possibility of becoming a stakeholder.

Besides the wallet functionality, users will be able to recycle their plastic waste through this mobile app by going to a collection point and receiving collection incentives in exchange for their collected plastic.

Screenshot of an earlier version of the Deposit App

Plastic Credits (PCRDs)

When waste is segregated and delivered to a collection point, we also need to create incentives to ensure that the collection point and recyclers are incentivized to take care of the materials in the best possible way. This is why we also have Plastic Credits (PCRD).

PCRDs are how collection organizations, sorting facilities, and recyclers can earn directly from people and businesses wanting to offset their plastic footprint. This creates a chain of incentives, driving proper collection and recycling with transparency and traceability through the blockchain.

PCRDs go through multiple stages, where each step allows for different usage of the credits
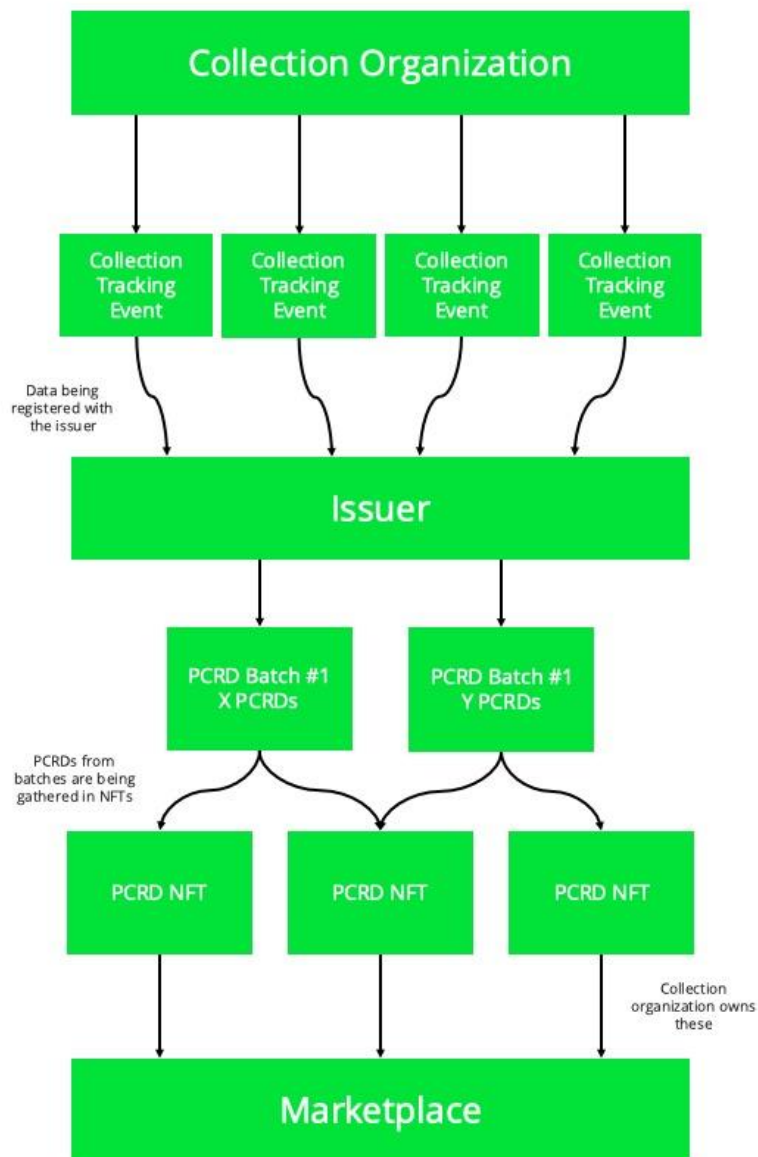
The issuer first issues PCRDs in batches according to the batching criteria, which can, for instance, be based on one or more of the following:

- Period
- Location
- Type of material

- Etc.

Each batch will always be based on the collection organization that owns the credits because they become the owner of the credit batches and can put them up for sale on the market.

The PCRDs are fungible within their respective batches and can be thought of as tokens that can be traded or used for other purposes, such as creating PCRD NFTs.

PCRD NFTs are a way to lock the PCRDs in proof of ownership and eventually offset. This is what end users will purchase directly from the marketplace. Users can select the desired PCRDs from the batches and create their own PCRD NFT.

The most obvious use case for PCRD NFTs is to offset it directly and use it as a proof of offset. Individuals can do this for personal impact, companies to offset their use of plastics, or even producers to bundle impact with their products (e.g., buy a pair of shoes and offset X kg of plastic).

Another use case that Empower is developing is using the PCRD NFTs for gamification of impact. Empower has created a proof of concept for an NFT called Plastic Heroes ([13]), where the Plastic Heroes can clean up plastic by buying and connecting PCRD NFTs. This concept won the Refi DAO NFT Hackathon under the category "NFTs that help restore ecosystems."

Similar to incentive schemes, there can be different standards and requirements, and as such, there will be other issuers of PCRDs. In the initial version, the issuers will be the only ones able to issue the credits directly. Still, in the future, we plan to integrate this with the Tracking module

so that PCRDs can be issued automatically upon completion of defined criteria (such as verification by 3rd parties, etc.).

We will also allow for bridging off-chain plastic credits to EmpowerChain to take part in the marketplace in future versions. This will require proof of retirement of said credits.

By the nature of the PCRDs, there is no max supply since they represent the collected plastic waste sent to recycling, so while there is a supply of plastic waste, there will be a possibility of creating a new PCRD. Likewise, we will get unique data and transparency by allowing any cleanup organization or plastic collector company to use the same protocol and issue their credits as PCRDs. In doing so, our infrastructure enables everyone to see which companies contribute or not in terms of volumes, funding, impact, and others, bolstering the drive for real impact, putting resources and capital where it has the most significant effect at each time.

There will also be the opportunity to create fungible PCRDs from the batches where the collection is verified, but there is a lack of individual or valuable data. These will most likely have a lower market value than the PCRD NFTs but still, have the potential to play an essential role in global waste collection funding and allow more businesses and individuals to take part in the worldwide cleanup.

Future Applications

More apps will be available for EmpowerChain Blockchain in the long term, and enhancements for the Deposit App. The intention is to gradually release each functionality and add a medium article or a document to describe them or add the missing information to this whitepaper.

One of the future applications that will be important is the on-chain buying and selling of tracking data. This needs a privacy-enabled marketplace for verifiable tracking data.

Roadmap

The roadmap is split into multiple phases that build on each other.

Phase 1: Conception

Initial white paper
Community building
Airdrop announcements
Preparing waste community (collectors and recyclers)

The first phase reveals our vision to the community about creating a public good in digital, decentralized infrastructure for waste management and empowerment.

The goal is also to prepare the community for future airdrops and incentives for the collectors and recyclers.

Phase 2: Testnets and redefining

As this is a public good, we need to ensure it aligns well with the people it is supposed to represent. Making sure we adjust to meet the community's needs is something that we expect will require a lot of testing and potentially redefining certain aspects of the EmpowerChain. As part of the testing process, we will also run an incentivized testnet.

Phase 3: Mainnet launch: Plastic Credit NFTs (PCRDs)

We plan to launch EmpowerChain, with the first modules being Proof of Existence and the Plastic Credit NFTs (PCRDs).

We are starting here because the collection incentive scheme, while "chronologically" in a supply chain, naturally comes before Plastic Credits and gets a lot of their value from the organizations tracking and recycling the collected materials.

Phase 4: Collection incentives schemes & deposit app

After the mainnet launch, the works start to get the collection incentive schemes developed and tested, together with the deposit app. During phase 4, we will begin rolling out the collection

incentive schemes with different levels of functionality to get it out and battle-tested as quickly as possible. Empower is working with organizations worldwide and with tens of millions of potential users in the already established networks. The aim is to bring incentives and a portal to decentralized finance to at least 100 million people by 2025.

Later Phases

We will be sharing more updates to the roadmap during the previous phases. After the release of the initial modules, the current plan is to focus on traceability and adding value to collection incentives and PCRDs through access to products, services, and liquidity.

Governance

In Proof-of-Stake blockchains such as EmpowerChain, there is a concept of blockchain-based ecosystem governance. When you own and stake tokens, you also gain access to propose and vote on on-chain governance proposals. These proposals can be almost anything, ranging from text-based signaling proposals for off-chain discussions to code changes and parameter adjustments (e.g., inflation rate, rewards, etc.).

The MPWR token is EmpowerChain's network token and, as such, will be used for governance as well. This is one of the critical ways EmpowerChain will be a public good, owned and controlled by the community and users.

A note on on-chain governance and our vision

Governance is a key to any Proof of Stake chain. Lately, there have been several examples of community-splitting governance, and we also need to improve this part of decentralized solutions.

The surprising thing with many existing chains is that they combine the newest technologies and software well out of data codes of law. The earliest known code of law dates back to 2400 BC, and since then, there have been thousands of years of trying and failing, developing best practices and best solutions for governance and voting. Even after all this time, it is still not perfect, but we believe that combining the best practices of the code of law with the best-decentralized technologies can bring us a new and significant step forward. We are bringing society and humankind forward.

So, to our big surprise, we see so many chains applying a code of law that was outdated thousand of years ago. It is in many ways like choosing to store your keys as rock carvings and looking away from thousands of years of technology development. If we want to move forward, we need to combine the best of technology with the best of governance. EmpowerChain aims to bring in the best practices we have from democracies, organizations, and enterprises worldwide and combine that with the decentralized and immutable nature of the blockchain. Code of law on the blockchain can disrupt the world, just as it has already proven to be the next generation of currency and financial infrastructure.

EmpowerChain aims to combine these strengths to elevate its utility, bring decentralization, equal opportunities, trust, and transparency, and make the world better.

Tokenomics

MPWR blockchain will have multiple tokens:

MPWR is the native token for governance, network fees, and cost for on-chain services. Tokens related to incentives, such as incentive schemes (e.g., EMPs) and Plastic Credits

The incentive-related tokens will have their tokenomics and were previously covered in detail. For details on the EMP token, see the EMP section.

MPWR Tokenomics

Symbol: $MPWR (sounds like "empower")
**Type:** Native network token
Network: Sovereign dapp chain: EmpowerChain.
Total (Fully Vested) Supply: 1,000,000,000

Initial Circulating Supply: 200,000,000

The EmpowerChain will have one native network token called $MPWR, used for security (validation and staking), governance, community pools, and network fees. It will also be used as the base token for different services such as buying plastic credits, providing liquidity to deposit tokens, and more coming in the future. The goal is to make the $MPWR token valuable and have high utility, a viable incentive for the recyclers, and a utility to track the plastic waste collected to ensure it is not cheating and has a real impact.

The initial supply will start with 200 million, getting a final amount of 1 billion MPWR, releasing 750 million through inflation during the 12 first years to drive adoption. After reaching the billion, the reward for staking MPWR will be generated through network fees from EMPs, generated by other deposit tokens, PCRD NFTs, credits, and tracking plastic waste registers.

Supply per year
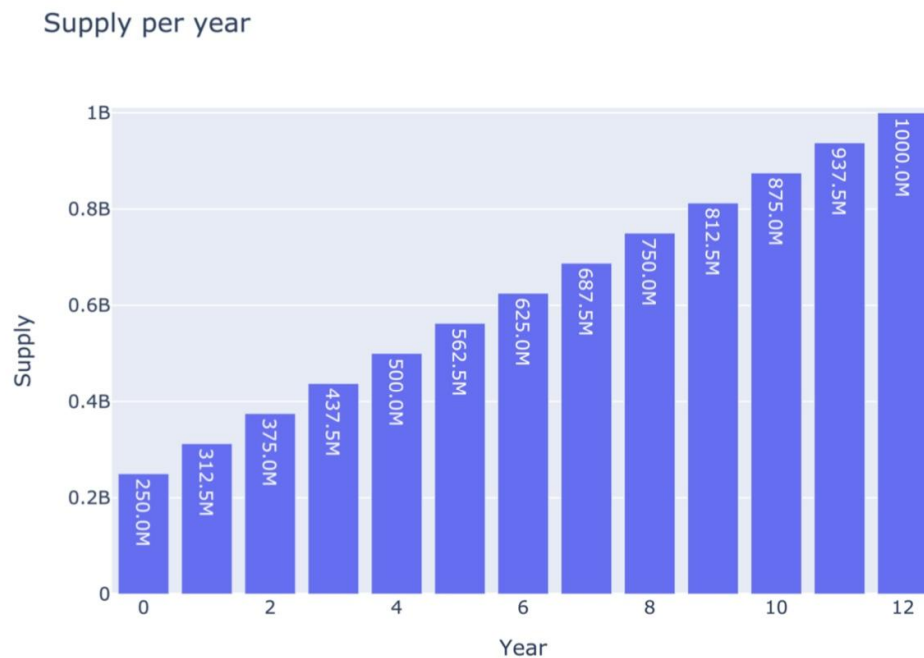
Since the release of the rest of the tokens will be linear, the interest will decrease per year, having an expected interest rate as shown in the graph below.

Interest per year
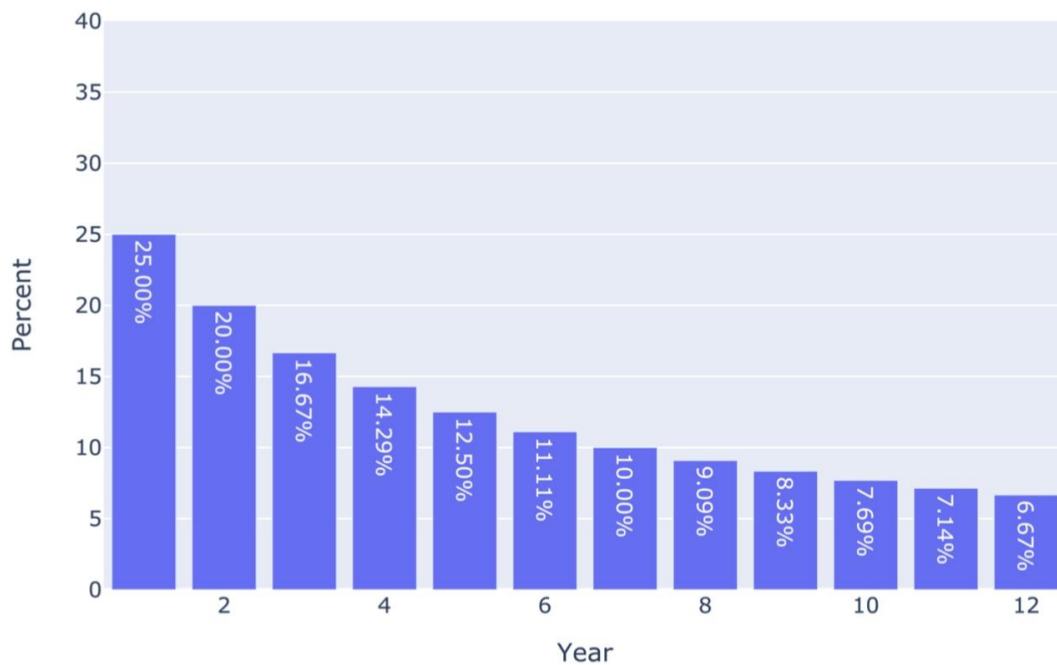
The MPWR token has the same goal as Empower: to help society and share the upside of making the world a better place.

One of the fundamental pillars of the circular economy that makes it possible is waste collectors. In support of their preceding work as active agents already involved in the recycling process, 25% of the token distribution will be allocated to them, restating their need and place in this new model.

On the other hand, since the MPWR blockchain will be developed using the Cosmos SDK framework, to make cosmos ecosystem members get involved with the MPWR blockchain when released, we will allocate another 24% of the token distribution airdrop for such ecosystem. The airdrop will include several networks in the cosmos ecosystem. The amounts required and the dates for the snapshot will be private and publicly released after the snapshot to avoid as much as possible any chance of gambling the airdrop.

There will be a 21% for Empower in a general split into several important parts:

- An 8% for the team and the network's contributors, locked up and vesting over 3-5 years with the opportunity to stake it. This with the purpose of *

- An 8% for Empower itself as an entity, ensuring long-term governance and alignment with circularity and sustainability principles and ensuring Empower keeps driving its development in line with and building its apps and solutions on the EmpowerChain. Empower will have a ten-year vesting period, with the option to stake it.

- And a 5% that will be destined to the Empower Foundation, with a permanent lock-up staked and whose rewards and earnings will go 100% to fund cleanups and waste management initiatives, giving proof and valuable data about these processes to trust the community about this foundation. All uses will be documented on-chain and going directly to measurable impact on the ground, funding cleanups, collection, and decentralized waste management infrastructure.

There will be a presale of up to 10% of the total amount of MPWR tokens to the public. There will be a restricted number of entities who can participate in the presale, but anyone will be able to sign up and get on the list. Participants will be selected on a first-come, first-serve basis, allowing the listed investors to buy the MPWR token at the presale price. The presale will be locked up and vested, with the schedule depending on the price. There will be a limited presale of *, avoiding dangerous holders that could put at risk the whole blockchain. In the case the presale isn't sold out, the remaining MPWR tokens will be distributed to the community pool

The final 20% will be destined to the community pool to fuel community engagement and decentralized decision making, marketing, and co-development, strategic fund initiatives, dex liquidity, and others.

Token Distribution

- **Waste collectors:** 25%
  - Engage and empower the ecosystem globally, in 100+ countries
  - Earned by collecting and recycling plastic waste and vested over five years
- **Cosmos airdrops:** 24%
  - Stakers of selected chains in the Cosmos ecosystem.
  - Community support and spread of ownership
  - Incentivize Cosmos community, aligned interests, and positive initiatives
- **Community pool:** 20%
  - Fuel community engagement and decentralized decision making
  - Marketing, Co-development & funding strategic initiatives
  - Dex liquidity
- **Team & contributors:** 8%
  - Lock-up and vesting over 3-5 years
- **Empower:** 8%
  - Ensure long-term governance and alignment with circularity and sustainability principles. Lock-up and vesting over 5 years
- **Empower Foundation:** 5%
  - Permanent Lock-up, all earnings/rewards go 100% to fund cleanups & waste management initiatives
- **Presale:** Up to 10% (Any remaining tokens will go to the community pool)
  - Lock-up and vesting over x years
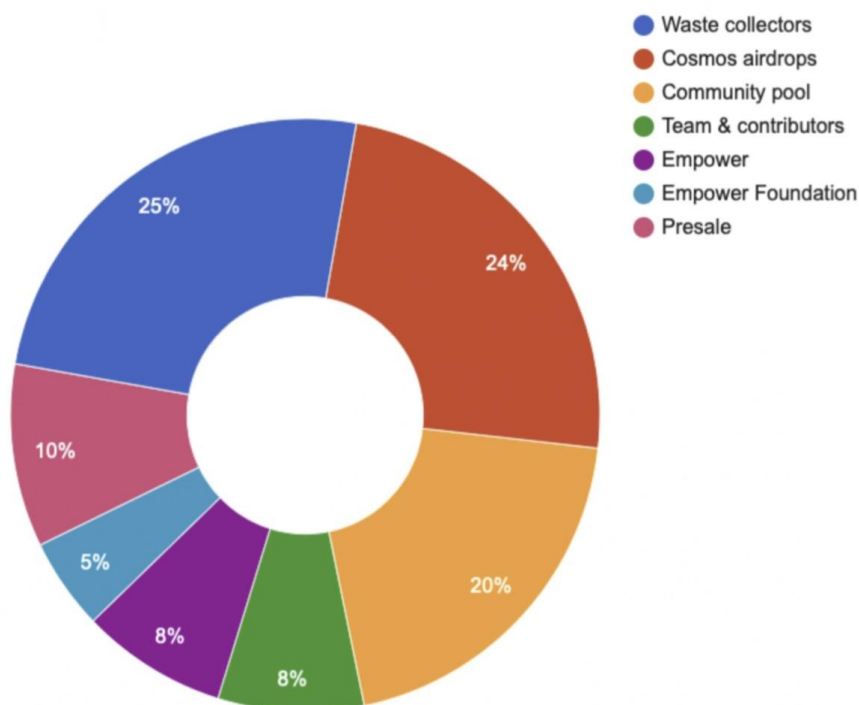
Empower and the EmpowerChain

It is useful to distinguish between the company Empower and the blockchain EmpowerChain.

The company is the entity that has worked since 2018 on finding the optimal ways to solve the plastic waste problem and has created a SaaS platform to solve the circular economy problem.

EmpowerChain is conceptualized by Empower but is created as an open public good. Think of Empower and the Empower SaaS Platform as the first users of applications on the EmpowerChain. Empower is committed to continuing to develop the EmpowerChain as we believe it is going to be crucial to have a common decentralized infrastructure for the Circular Economy. Empower will bring a global community and entrepreneurs and developers to EmpowerChain to develop it as a core infrastructure for the circular economy, where Empower is just one of many use cases and applications giving it value.

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