Empowerchain Whitepaper draft

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Intro

In 2018, Empower was started to see how blockchain technology and digitization could help solve the global plastic waste problem.
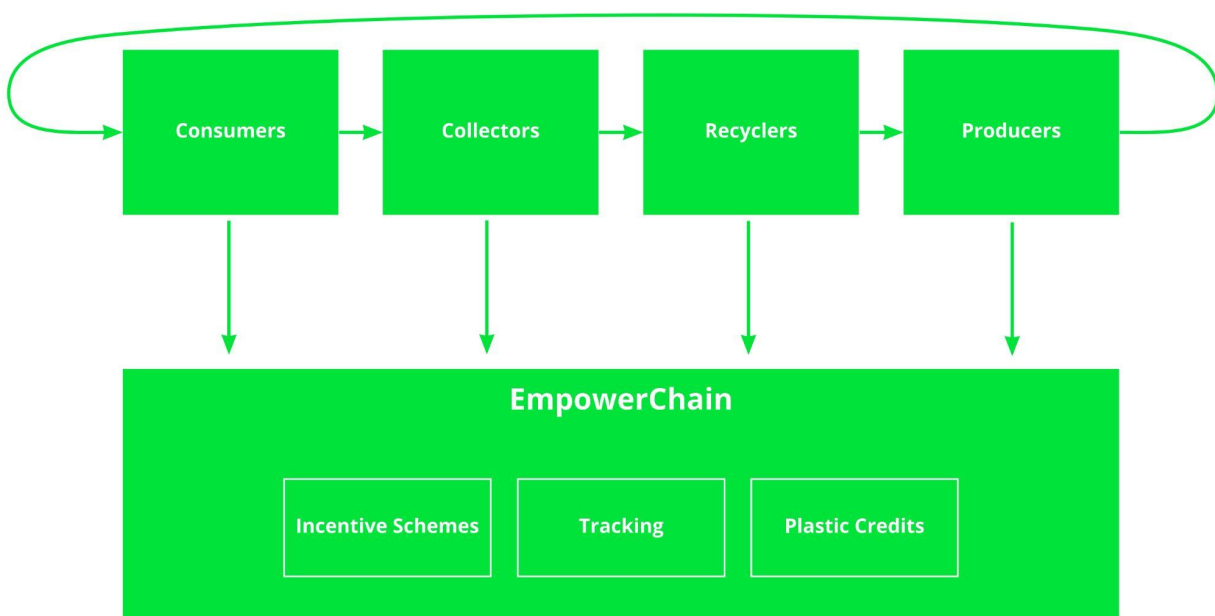
Globally, only 9% of plastic waste is recycled. This means that we waste hundreds of billion $ worth of materials and trillions of $ worth of products every year. After 100 years of a linear economy where stakeholders are siloed with no responsibility for what happens outside their part of the value chain, there is now a massive lack of both waste collection and recycling infrastructure and collection data. This makes the shift towards a circular economy very hard and time-consuming. At the same time, it is increasingly prevalent that the systems we use to manage our resources must undergo a complete transformation to a circular economy.

The Empower Global Plastic Waste Deposit & Tracking System is based on the same philosophy as the Norwegian plastic bottle deposit system with reverse vending machines. This system turns waste into resources by giving plastic bottles an enhanced value beyond the material itself. This way, it crowdsources collection and segregation at source efficiently. The outcome is that 98% of all plastic bottles in Norway are recycled.

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Empower aims to stop the leakage of plastic and other waste into the environment by cost-efficiently incentivizing collection and segregation at source, and at scale, by giving value to used materials and products everywhere.

Empower allows anyone to register on the Empower Platform to set up verified collection points around the world digitally. These Collection Points can then issue financial rewards in the form of digital tokens in return for the deposit of plastic or other "waste." Empower does not take ownership of collected materials or data but helps the local collection entrepreneurs access funding for cleanups and potential buyers of the collected materials. This way, we create a rapidly growing, global, and distributed waste collection infrastructure, entrepreneurs, and sustainable jobs within the waste management industry.

To further boost the capabilities, scalability, and impact of the Empower Platform, the Empower team has been working to put the learnings and experiences from operating within the whole value chain, including grass root informal sector, in more than 40 countries over the last four years to work. This is done by launching the **Empowerchain, the digital infrastructure for a circular economy**, its native $MPWR token, standardized recycling incentive tokens like $PCRD (Plastic Credits), and customizable incentive tokens like the EMP (the Empower B2C Proof of Contribution token). The EmpowerChain is built to enhance a tried and tested concept that revolutionizes profitable plastic waste removal and enables a circular economy.
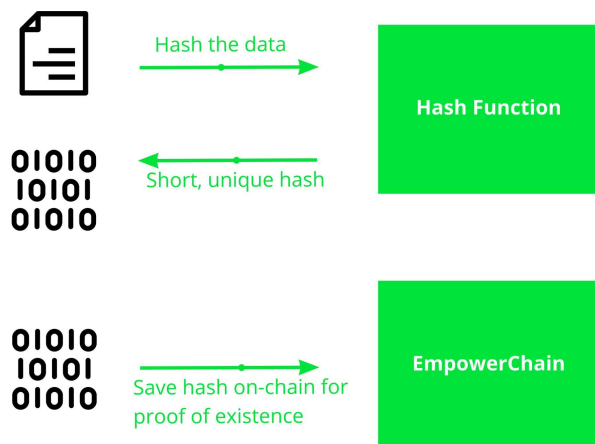
EmpowerChain Features and Value Props

1.1 Proof of Existence (Tracking) is the basis for tracking materials and products through complex value chains and making an auditable trail. To enable secure and immutable data points, like timestamps, signatures, and coordinates on the journey of materials, is the basic feature of the Empowerchain. The purpose is to help enable transparency and trust in waste collection and management and ultimately create transparent circular value chains where data is shared across the chain to ensure cost efficiency and optimal resource utilization—the only way for the circular economy to outcompete the linear one.
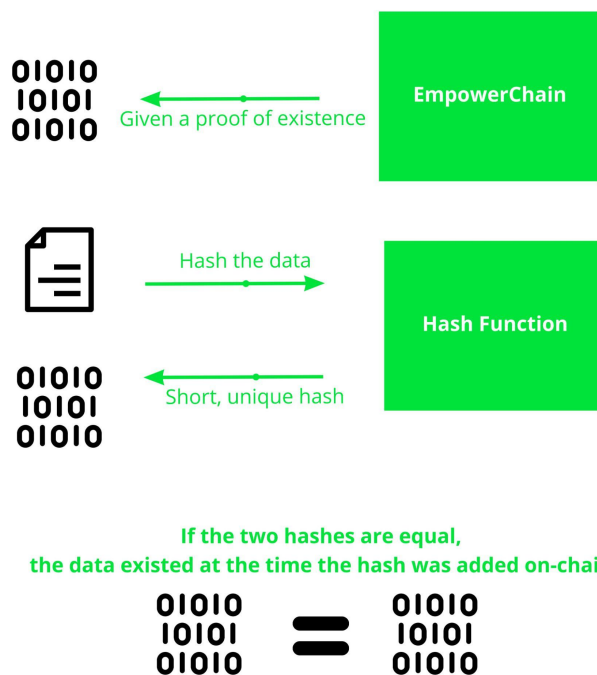
1.2 Proof of existence will also let you track your waste and get transparency in where it ends up, efficiently incentivizing participation and laying the groundwork for further incentivizing positive behavior change, take back systems, and crowd engagement.

Technical: Proof of Existence is a concept made possible by the immutability of a blockchain and a cryptographical technique called hashing. Combining these two technologies provides the ability to prove that data existed at a given point in time and has not been altered since then. It is implemented on the Empowerchain as a custom Cosmos SDK module. When a transaction is completed by two parties on the Empower Tracking platform, the data is first hashed before it is saved onto the Empowerchain for proof of existence. Then the data set can be re-hashed and compared to the existing hash to provide proof of existence and immutability.
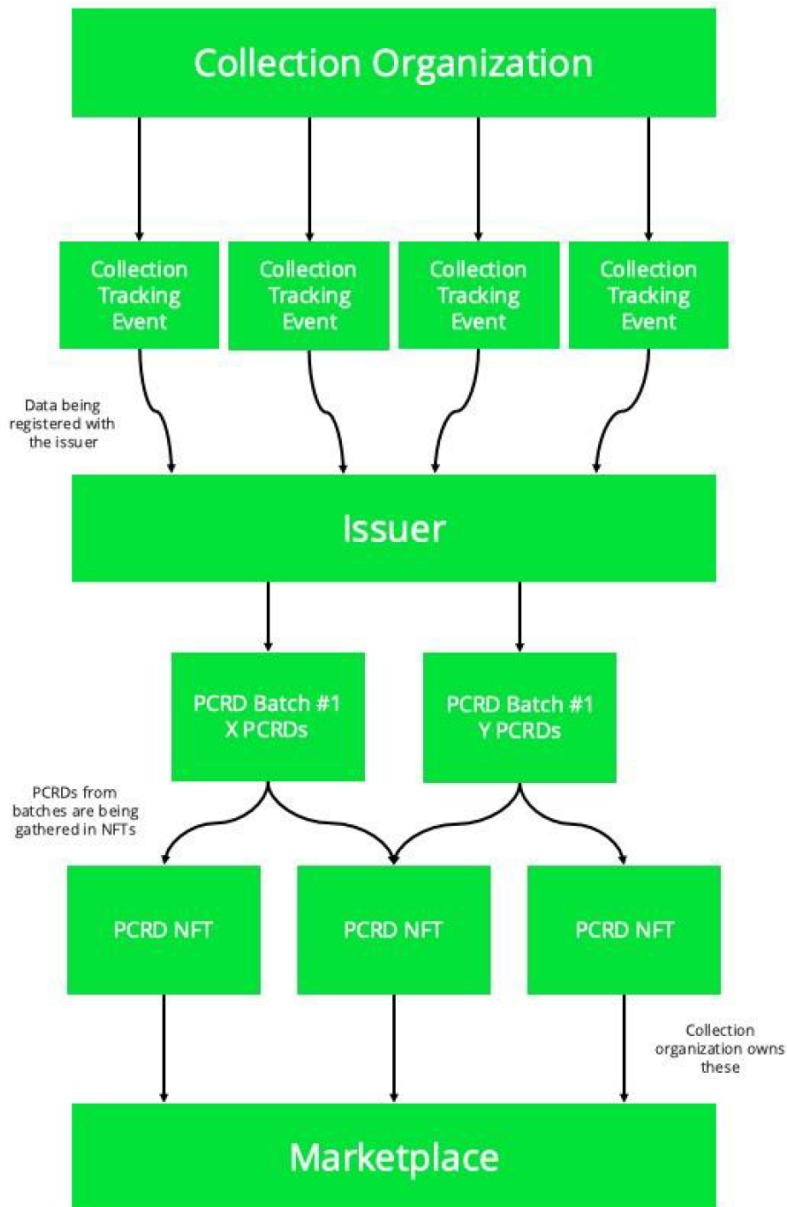
Hashing data to the blockchain:

Checking the data set:

EmpowerChain

Given a proof of existence

Hash the data

Hash Function

Short, unique hash

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

2.1 Plastic Credits ($PCRD) - A second important feature is turning proof of waste collection data (IDs, GPS, timestamps, pictures, signatures, receipts, waybills) into Plastic Credit NFTs or what we as an NFT on the Empowerchain call a $PCRD. Plastic Credits are used increasingly by companies and individuals to offset their plastic footprint and incentivize optimization of their plastic use, as well as ensure they fund cleanups of the same amount they have to use themselves. The $PCRDs are transferable credits that fund cleanups all around the world.

The Plastic Credit market is in an early development phase where standards are still being made and implemented. Still, over time it is assumed that Plastic Credits might get to a similar market size as Carbon Credits. Empower enables any cleanup organization to create their own plastic credits, get them verified by a 3rd party, and then put them on Plastic Credit marketplaces. By allowing anyone to create their own plastic credits and offering them to decentralized marketplaces, we democratize the plastic credit industry, remove intermediaries, and ensure that funds can be allocated more efficiently and according to their purpose. Empower will aim to both build its own marketplace for plastic credits, but also build partnerships with several marketplace providers like Stargaze and Regen via Inter Chain Accounts (ICA) to increase liquidity and reach a more extensive base of potential buyers and traders.

Technical: The $PCRDs is a native EmpowerChain NFT (Non-Fungible Token) issued to a collection organization's wallet. Each $PCRD will hold and point to unique data about that specific collection of materials. The $PCRDs can then be sold on the Empowerchain or transferred to other marketplaces and ecosystems using inter-blockchain communication (IBC).

The process of PCRDs from collection to marketplace

2.2 Plastic Credit Registry. Empowerchain and global partners are building a Plastic Credit Registry to enhance the transparency and trust in Plastic Credits. First, when a user burns the $PCRD or retires a regular non-NFT Plastic Credit, they can claim the offset. When that happens, it will be registered in the registry, and in the case of the $PCRD, a $bPCRD is issued to the burner's wallet.

The Registry is where all verified Plastic Credits (both Empowers $PCRDs and Plastic Credits of other suppliers/verifiers) are registered to create transparency and legitimacy for the Plastic Credits market. The registry will keep track of the number of plastic credits issued, origins, the ID of issuers, and other critical protocol data. The Registry will not only keep track of the issued and outstanding Plastic Credits but also the amount of burned/retired Plastic Credits. The Registry is open for any issuer of Plastic Credits. A Plastic Credit Registry DAO where any actor in the Plastic Credit space can apply to become a member and participate in governance will allow issuers and platforms to register their Plastic Credits in the Registry. The DAO's purpose is to ensure the Plastic Credit Market and mechanisms develop under best practices built on transparency and traceability.

A plastic credit registry will be an essential public good to avoid the pitfalls seen in the growth of the Carbon Credit markets, where the traceability and proof of impact have been very variable when audited and also very costly to look into. Also, statistics from the registry can be used to make "Offset Leader Boards" and provide other valuable statistics and data to improve efficiency and coordination in the war on waste.

Technical: The registry is a custom Cosmos SDK module where membership and rules are controlled on-chain by a DAO (potentially using the new groups module). The registry ensures, by being on-chain, that plastic credits cannot be "double-spent." Burning $PCRD tokens essentially turns the liquid $PCRD token into a "soul-bound" (non-transferable) token that proves offset.

3.1 Deposit App. Increasing collection and segregation at the source to make sure waste is not mixed and losing its value before it is collected is a key to enabling the Global Deposit system and with the wide variety of products, packaging, and materials, combined with the relatively low value we need to find the optimal and most cost-efficient way of crowdsourcing these services to make it viable.

The Empower Deposit App is the tool that makes individuals, both waste pickers and consumers, a formalized and valuable part of the value chains. The Deposit App connects anyone anywhere with a global network of collection points. These Collection Points can

verify the collection of the individuals and incentivize their contribution through digital tokens, vouchers, or other available added benefits. This way, we establish the digital infrastructure needed to implement a Circular Economy for any material, packaging, or product on the market. Furthermore, the combination of a distributed collection network and a connected wallet available for any person or business holding materials/waste ensures that we can implement the necessary incentives to crowdsource collection and segregation at source at scale.

The Deposit App and Collection Points will also provide live data and the ability to adjust incentives to reach the wanted recycling levels. As the producers who monetized the product firsthand become accountable for the cost of collection and recycling through extended producer responsibility regulations, we provide the tools to make it cost-efficient and value-adding instead of a burden.

The Empowerchain, in combination with the Empower Deposit App and Empower Tracking Platform, is the basis for a sound, scalable deposit system for any products and materials. With these critical pieces of infrastructure, we can create incentives for all parties to optimize both the products, materials, and packaging and collection and recycling processes to achieve circularity. Aligning all stakeholders to make products and materials that are sustainable and circular, and far superior to linear ones will enable us to replace an economic system where trillions of dollars worth of materials are wasted every year with a circular, inclusive system that rewards cooperation, sustainability and optimal use of resources.

Technical: The Deposit App is an all-in-one app that will work as a digital wallet where the users can manage their assets and NFTs belonging to the EmpowerChain blockchain. Further access to DeFi solutions will be integrated in-app through integrating with other blockchains, as well as cross-chain communication with interchain accounts (ICA) and interchain queries (ICQ)
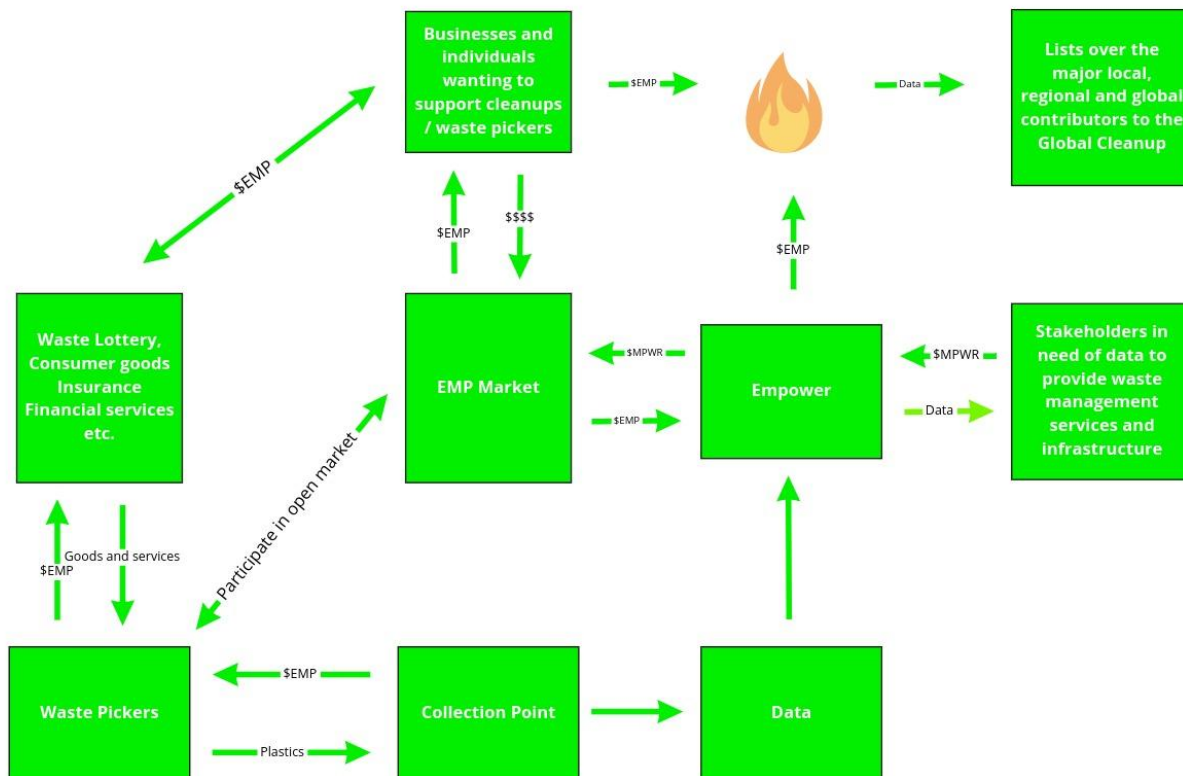
3.2.1 EMPs. To complement and enhance the value provided to the Deposit App users beyond the current market value of materials, Empower is also creating the $EMP. The $EMP is the B2C incentive token built on the Empower Platform. It is a Proof of contribution paid out to individuals who deliver materials to verified collection points and verifies the delivery through the Deposit App. By incentivizing the use of the Deposit App, we get more and better data on waste collection into the platform. As a result, we can create more optimal collection- and take back -systems while rewarding the individuals with an additional incentive. The added granular data will also add value for both buyers of plastic credits and buyers of the actual materials collected.

The maximum number of EMPs is not hard-capped, but Collection Points must provide data and audits to keep the rights to issue EMPs over time. They will also have maximum daily quotas to control both the inflation and the price of the EMP token and to limit potential fraud and the issuance of new tokens not reflecting actual waste collection and

accurate data. The Empower Tracking Platform will ensure that 3rd parties verify the collected volume regularly, and collectors that do not fulfill requirements will lose their access to issue EMPs.
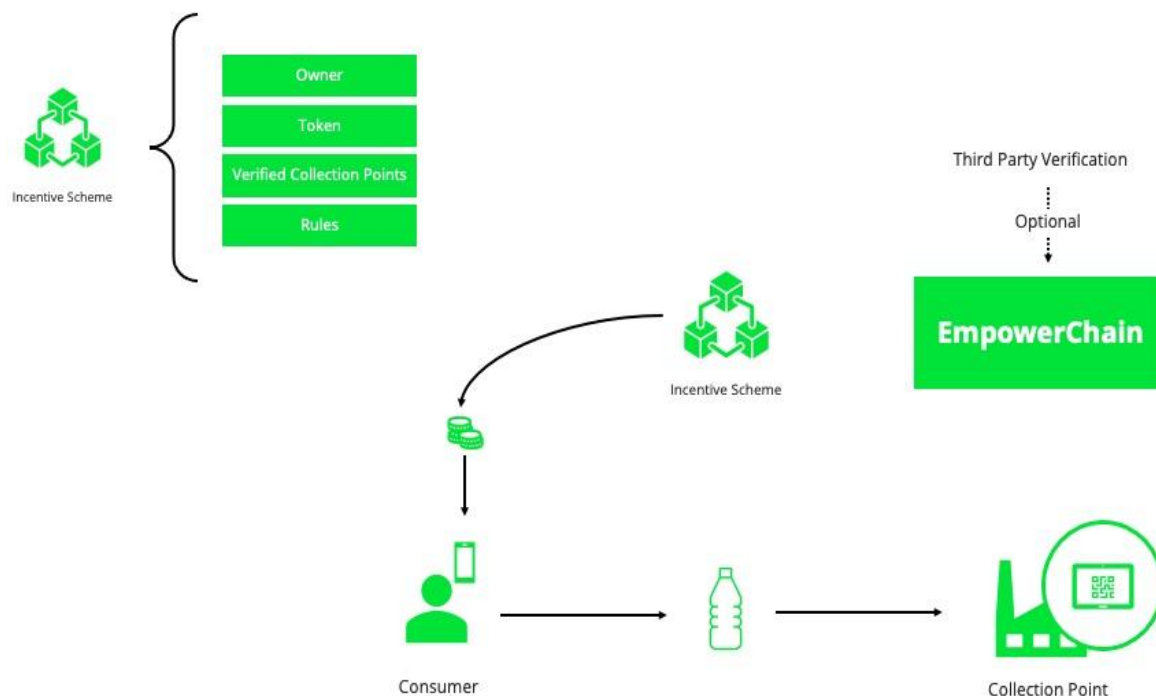
By buying $EMPS, anyone can cost-efficiently contribute to providing stronger incentives for those who contribute on the ground. All without intermediaries or lack of documentation, having a direct, positive, and traceable impact on the environment. It has value for brands or consumers using recycled plastic materials that want to guarantee they are paying decent payment for the grass root collectors. The $EMPs have a burning mechanism to claim the offset/ranking.

The monetization of global 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 structured and made available to stakeholders needing it to provide waste management services and infrastructure. The fees will go to buy back and burn EMPs, giving the value back to the individuals contributing to the global cleanup.

Technical: The EMP token is a fungible token on the Empowerchain, which will be implemented as an Empower Deposit Incentive Scheme. See the section on customizable deposit tokens & incentive schemes for more details.

3.2.2 Customisable Deposit Tokens & Incentive Schemes. The $EMP is one example of a Deposit Token that will contribute and add value to waste collectors. The Empowerchain will also enable anyone else to create their own deposit-/incentive tokens. These incentives can be given in return for specific products or materials for specific regions, countries, or similar. Collection Points that are verified for an incentive scheme can then issue that token under the applicable terms and conditions set by the creator of the incentive scheme. By implementing this incentive scheme module, we open up a global decentralized, and dynamic market for collection and segregation at source, where incentives can be tailored, combined, and customized by individuals, corporates, or governments to reach the goals we set on the road to a world without waste.

3.3 A Cosmos Bridge & Portal to DeFi. As we have stated, the Empower Deposit App is an integral part of enabling the Circular Economy. Primarily by connecting holders of materials

with verified collection points and as a means to efficiently distribute incentives. It is also a key enabler to bringing hundreds of millions of people into decentralized finance and, more specifically, the Cosmos Ecosystem. We are banking the unbanked and providing equal opportunities around the world.
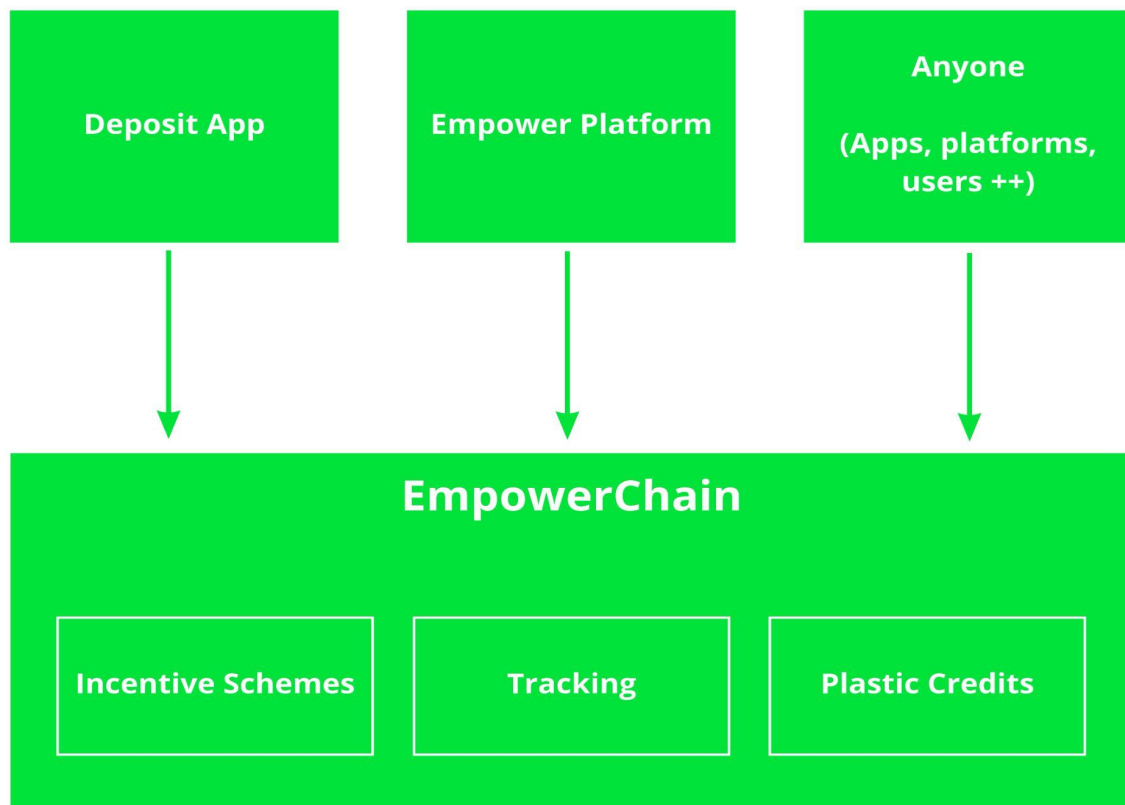
The Deposit App and Empowerchain combined efficiently function as a bridge from the real-world circular economy into Cosmos DeFi. By providing users revenue from the collection, sorting, or delivering their waste and providing them the payments and incentives in the "in-app" wallet that is also IBC-connected. We provide additional revenue for waste pickers and contributors while at the same time onboarding them into the Cosmos ecosystem and providing direct exposure and access to decentralized financial tools and services. This enables "in-app" financial inclusion, savings and interest, passive revenue, debt and funding opportunities, health insurance, credit scores, global cross-border transfers, and much more - over time, making the Empowerchain the most frequently used chain in the world.

Thus the Deposit App becomes a key enabler and transformative bridge that brings mass adoption to Cosmos and DeFi on the back of a better, cleaner, and more sustainable world.

Technical: Thanks to standards around inter-blockchain communication (IBC), the Deposit App user will be able to earn EMPs and other incentives on the Empowerchain while seamlessly exchanging them for other coins such as USDC, ATOM, or other tokens that are available on different platforms and exchanges. This allows users to interact with any other interchain-connected system and, as a result, have a portal to the decentralized economy in their pockets (somehow like Vitalik?).

4. Down the Road(Map) Product Passports and Digital Twins (still to be conceptually finalized and developed), products with higher value generally have less chance of falling outside the economy. Thus, making a digital twin of various products and adding data can be a valuable tool to increase circularity. Another key point of digital twins is the opportunity to create token-driven take-back systems, where products with a unique identity can be delivered back at any collection point and be recognized and tracked onwards into the correct circular value chains where it has the highest value. Equally, by creating digital twins, we enable NFTs and fungible tokens to accompany digital twins and other products, making an End User Inventory (EUI) in their Deposit App. This can help ensure that legal ownership is always clear, reducing fraud and facilitating product information updates, take-back systems, and several opportunities to close the loop while

increasing the security of ownership and document change of hands. A fully launched system could save insurance and law enforcement billions annually and almost completely eradicate specific types of fraud and crime. At the same time, it will have the potential to increase the daily registrations on the Empowerchain from a few thousand to billions, generating a very valuable piece of decentralized infrastructure with immense value potential for the ones securing it.

TOKENOMICS

$MPWR - THE EMPOWERCHAIN TOKEN

Symbol: $MPWR (sounds like "empower")
Type: Native network token
Network: EmpowerChain, a sovereign Layer 1 dApp chain
Total (Fully Vested) Supply: 1,000,000,000
Initial Circulating Supply: 200,000,000

$MPWR is the network and governance token of the Empowerchain. The $MPWR tokens can be staked to secure the network, for participation in the governance, and for earning emissions and network fees. 75% of all fees and emissions on the Empowerchain are distributed to the stakers, the delegators and validators, who secure and contribute to the network. The remaining % is distributed to the Community Pool (5%) and Team(s) (5%) to incentivize new platform users in the waste collection and recycling community (15%). This will be decided by governance.

Fees on the EmpowerChain are by default paid in $MPWR. Thus, the Tracking Proof of Existence, the Deposit App, and the issuance of Plastic Credit $PCRDs will generate demand for, as well as fees in, $MPWR tokens. Other tokens could eventually also be used for fees. They would then be distributed equally to the stakers of $MPWR tokens, generating a diversified reward stream for the delegators and validators.

The Empower Platform is already generating fees to the $MPWR stakers through the tracking solution. At the same time, the launch of $PCRDs, the Deposit app, and various incentive tokens upon mainnet launch are expected to generate significant growth over time as we move from a few B2B users into millions of individuals connected via collection points and deposit incentives.

The initial supply will start with 200 million, reaching a final amount of 1 billion $MPWR. After that, 800 million will be released linearly with 66,666,667 tokens per year through inflation during the first 12 years. After reaching 1 billion, the reward for staking MPWR will be generated through network fees.

$MPWR Token Distribution
Genesis Distribution of Tokens:

- **Waste collectors:** 20%
    - ➜ Earned by collecting and recycling plastic waste and vested over 12 years
        - ■ Monthly activity requirement
    - ➜ Goal: Engage and empower the waste collection community globally, in 100+ countries

- **Cosmos airdrops:** 25%
    - ➜ Stakers of selected chains in the Cosmos ecosystem
    - ➜ Community support and spread of ownership

- **Goal: incentivize Cosmos community, aligned interests, and positive initiatives

- **Empower Foundation:** 5%
  - Permanent lock-up, all earnings/rewards go 100% to fund cleanups & waste management initiatives purchase and burning of $EMPs and $PCRDs

- **Community pool:** 10%
  - Marketing, co-development & funding of strategic initiatives
  - Dex liquidity
  - Goal: Fuel community engagement and decentralized decision making

- **Team & contributors:** 10%
  - Lock-up and vesting over 3-5 years

- **Empower Strategic Reserve:** 15%
  - Lock-up and vesting over 3-12 years
  - Goal: Ensure long-term governance and alignment with circularity and sustainability principles.

- **Presale:** Up to 15% (any remaining tokens will go to the community pool)
  - Locked-up and vested, with the schedule depending on the pre-sale price.

Emission Schedule

Legend:
- Staking Rewards
- Usage Incentives (Waste Collectors)
- Team Vesting
- Community Pool
- Kick Start Waste Collector Incentives
- Private Sale
- Strategic Reserve
- Airdrop