

How NFC, blockchain and behavioural psychology are fighting the plastic crisis

BottleChallenge: technology built for systemic change

Most environmental apps end with a carbon footprint calculation and a vague sense of guilt. BottleChallenge was built differently: around a concrete action, a measurable outcome and technology that verifies every step.

The nonprofit project by BrainGreen Foundation has just launched on the App Store and Google Play after nearly three years of building infrastructure. The goal is environmental, but the system architecture is purely engineering.

NFC as the point of contact with reality

The central interaction is NFC. When a user visits a partner venue for a free water refill, they hold their phone to a tag placed at the refill point. It takes a second. The event is recorded with a precise timestamp and geolocation, assigned to a unique tag and verified by the backend.

The choice of NFC over QR was deliberate. A QR code is a static image that can be photographed, shared and used from anywhere in the world. NFC requires physical presence. Combined with geolocation verification and a time interval between consecutive check-ins, this creates a system that is resistant to abuse without requiring any additional verification steps from the user.

Tags are supplied to partner venues by the project. They work with any standard NFC-enabled phone, with no additional apps beyond BottleChallenge.

Blockchain as a trust layer

Every NFC event triggers not only a loyalty points credit but a parallel process in the Eco-In system, a platform built by BrainGreen Foundation.

Verified data about the refill, including time, location and quantity of plastic prevented, is written to a public blockchain as an immutable record. One Eco-In token represents one kilogram of plastic that did not enter the environment. Each token is single-use and cannot be assigned to more than one organisation. The burn mechanism is irreversible.

The blockchain serves a precisely defined function here. It is not a marketing element or a fashionable addition, but a trust layer for parties that need independent data verification. For companies using the Teams module and reporting environmental data under CSRD and ESRS E5, it provides an auditable chain of evidence from a physical event to a line in a report. An auditor can trace every token back to its source: a specific NFC tag, a specific location, a specific date.

Gamification designed behaviourally

The EcoDrops system is not a random motivational add-on. It is designed around three behavioural mechanisms: immediacy of reward, friction reduction and social visibility.

Immediacy: points appear at the moment of check-in, not a week later. Rewards, including museum tickets, cinema and theatre visits, concert tickets and hotel discounts, are accessible as soon as enough points have been collected.

Friction reduction: every step in the process is trimmed to a minimum. The map is instant. NFC takes a second. Registering a partner venue with a Google Business profile takes one click.

Social visibility: individual and group rankings, cross-department challenges within companies, and avoided bottle counters in user profiles. Behaviour that is visible to others becomes part of identity rather than a private decision.

Scalability through crowdsourcing

The 57,000 points across 95 countries are partly the result of mapping from OpenStreetMap and other open data sources covering public drinking fountains. Users can add new points directly in the app and earn EcoDrops for doing so. They also report non-functioning or non-existent fountains. The data maintains itself through crowdsourcing, which is the only realistic strategy at this scale and geographic spread.

Longer term, conversations are underway with municipal drinking fountain operators in several countries about installing NFC tags, which would convert those map-only points into full check-in locations.

BottleChallenge is a nonprofit project by BrainGreen Foundation, run entirely by volunteers, with no advertising and no investors.

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