



PWR Chain

By: Jason and Riley



Wasted Electricity/Money

In 2012, a UK study showed that over 134 MILLION euros of electricity is wasted each year from overcharging mobile phones and laptops

1 in 5 Britons leave their devices plugged in when the battery is already full

1 in 10 are too “lazy” to pull the charger out, despite the money it costs them

Increases household electricity bill by an average of 60 euros per year



What is PWR Chain?

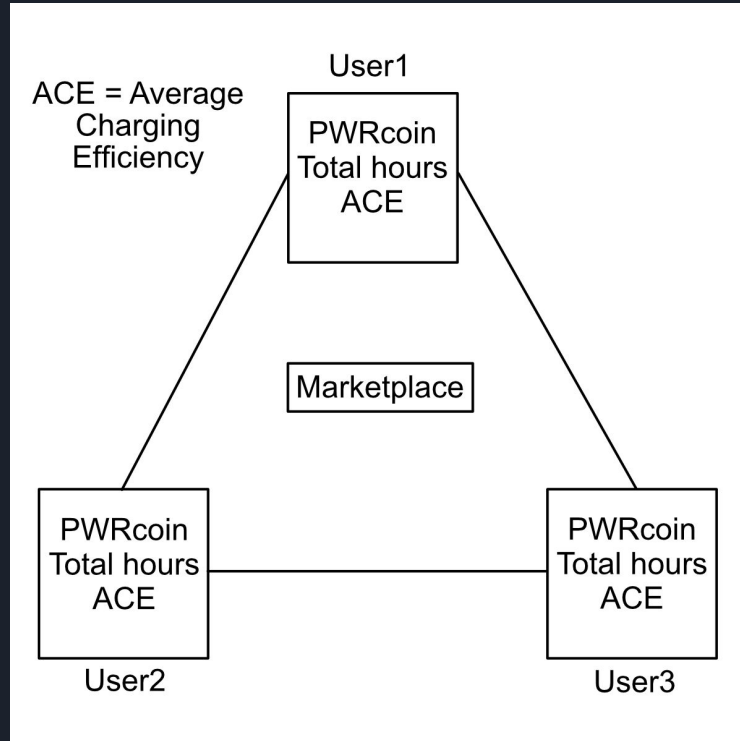
- PWR Chain is a decentralized, P2P network where users can earn, sell, and spend our cryptocurrency (PWRcoin). This network uses a blockchain that stores every transaction in the network, along with user info.
- Created to start raising awareness for sustainable laptop charging while rewarding users who actually make an effort to do so.
- Users earn PWRcoin depending on their charging efficiency over the span of each week. Better efficiency = more PWRcoin.
- PWR Chain is the Charging Currency, a validation of users' efforts to be cleaner. This identity will be driven home with nature and electricity themed imagery.



Origins and Owners

- PWR Chain is inspired by ecological tax credits, and by taxing carbon emissions.
- This implementation takes the core concepts of that and applies them at an individual level regarding the most conveniently trackable sustainability data.
- The stakeholders are the owners of the cryptocurrency and users of the network, as well as humanity at large.

Overview of the Network





How Our Software Works

- Users enter our network by opening our app and logging into their accounts.
- Once logged in, our platform runs as a background process on their computer, just like an antivirus software does.
- As long as the process is running in the background, each users charging data is constantly being updated (even when their computer is sleeping)
- When users want to see their data, visit the marketplace, or view the blockchain, they can simply just click “open network” where a new GUI window will open and show them everything that’s happening in our network



Charging Efficiency Algorithm (pseudocode)

Class User

batteryPerc = user's current battery percentage

isCharging = true if user is currently charging, false otherwise

timeAtMax = amount of time batteryPerc is at 100

chargingEffic = efficiency of each charge (is 100 at start of each charge)

weeklyChargingEffic = user's charging efficiency at the end of the week (is 100 at start of each week)

avgChargingEffic = total overall charging efficiency for that user (starts at 100 on account creation)

GetChargingEffic () = function that gets the user's charging efficiency



Charging Efficiency Algorithm (cont.)

```
GetChargingEffic () {  
    while (isCharging == true) {    (executes every second)  
        if (batteryPerc == 100) { timeAtMax ++ ;}    (in seconds)  
    }  
    timeAtMax = timeAtMax / 60 ;    (convert to minutes)  
    chargingEffic = chargingEffic - timeAtMax ;  
    if(chargingEffic < 0) { chargingEffic = 0 } ;  
    weeklyChargingEffic = (weeklyChargingEffic + chargingEffic) / 2 ;  
    avgChargingEffic = (avgChargingEffic + chargingEffic ) / 2 ;  
    return chargingEffic;  
}
```




Converting Charging Efficiency to PWRcoin

$\text{PWRcoinRewarded} = \text{weeklyChargingEffic} / 100 ;$

Thus, higher $\text{weeklyChargingEffic}$ = more PWRcoin



P2P Marketplace

PWRcoins could be bought/sold between users and also spent on the marketplace.

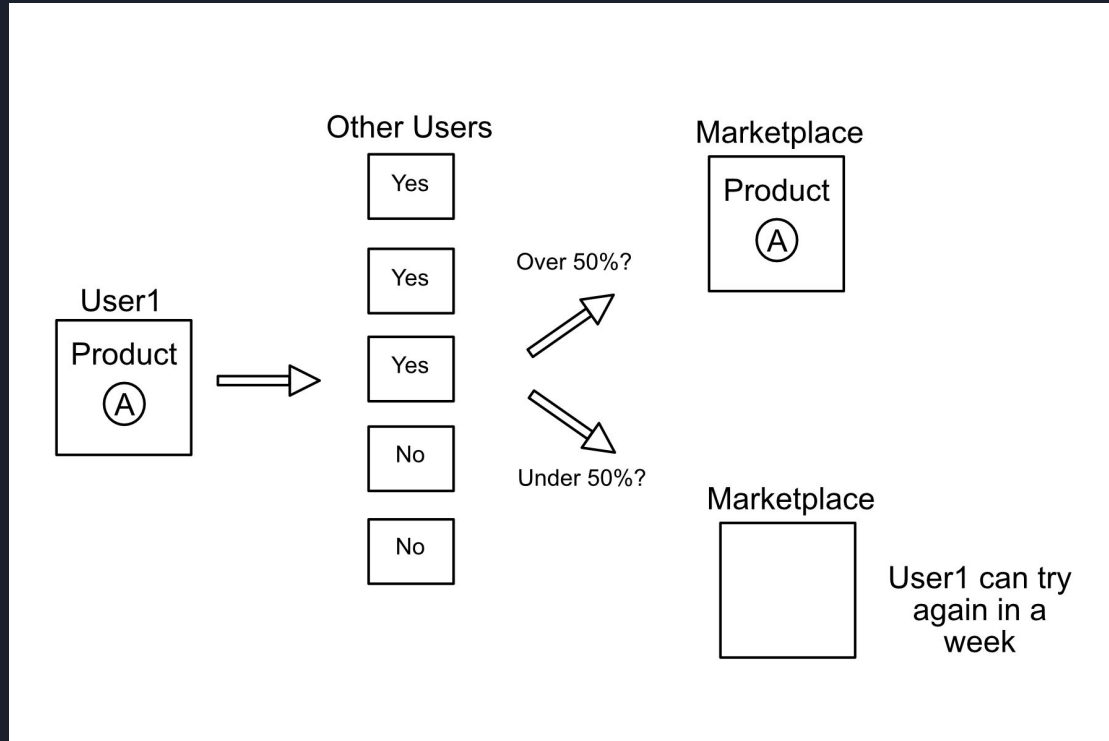
Users can exchange certain amounts of PWRcoin for vouchers that can help pay for their electricity bills at home.

Users can also buy and auction off energy-efficient products on the marketplace, but need approval beforehand. (Think of it as a decentralized eBay with certain restrictions)

Any user that has at least 20 hours logged on their account can vote on product approvals, and in return they are rewarded 1 PWRcoin.

If at least 50% of the voters say yes, then the product is approved and put on the marketplace. If not, then the seller can try again in a week.

P2P Marketplace (cont.)



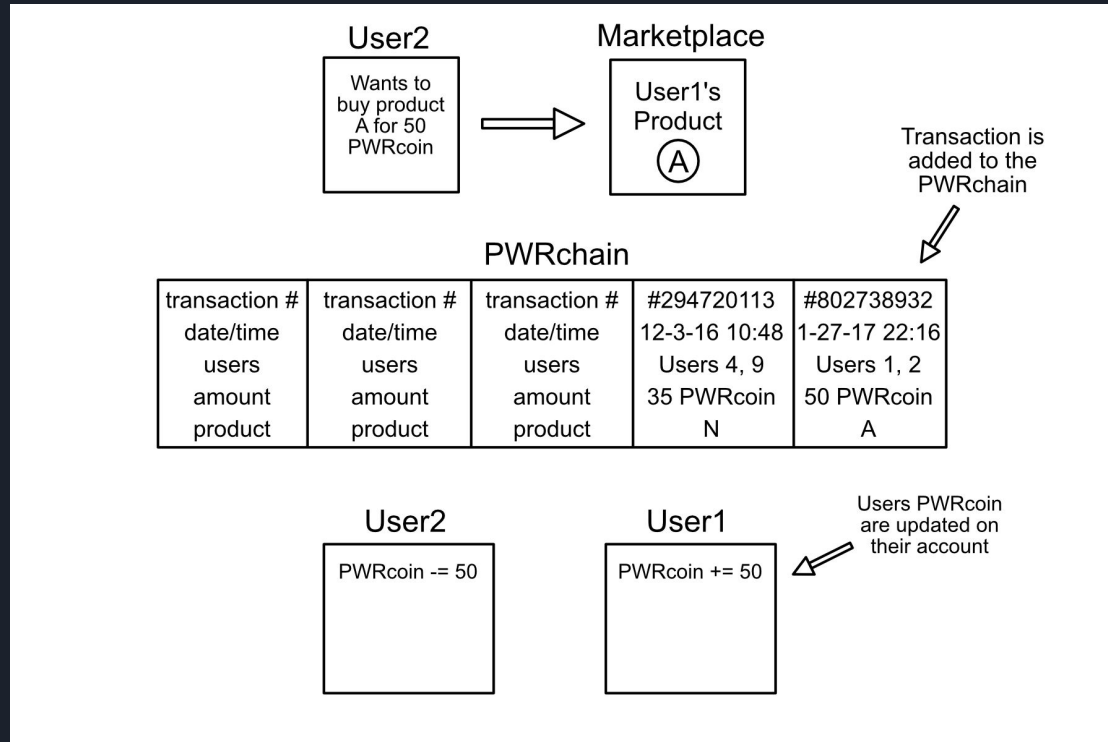


Transactions

Every transaction done within the network is stored in the PWRchain forever.

These stored blocks can be viewed by any user at any time, and cannot be modified at all.

Transactions (cont.)





What are the rewards?

The main reward of PWR Chain is meant to be exchanging digital coins for Vouchers for your electricity bill. This is meant as the initial primary lure, after which the goal is to grow the marketplace for additional uses to become viable on a larger scale.

PWR Chain is a currency, so it can be bought and sold between users.

Additionally, it can be spent on a digital marketplace of energy-efficient products



Intended Outcomes

- The primary goal of PWR Chain is to appreciably lessen the waste of electricity caused by careless laptop charging.
- The scope of it is more expansive, as it is a proof of concept. Other simple implementations would follow easily for tracking smartphone charging, as well as other charged devices like tablets and smart watches.
- The true potential lies in PWR Chain being a sustainability currency rewarding people for acting accordingly. With one implementation successful, other uses to support good sustainability habits can crop up naturally.