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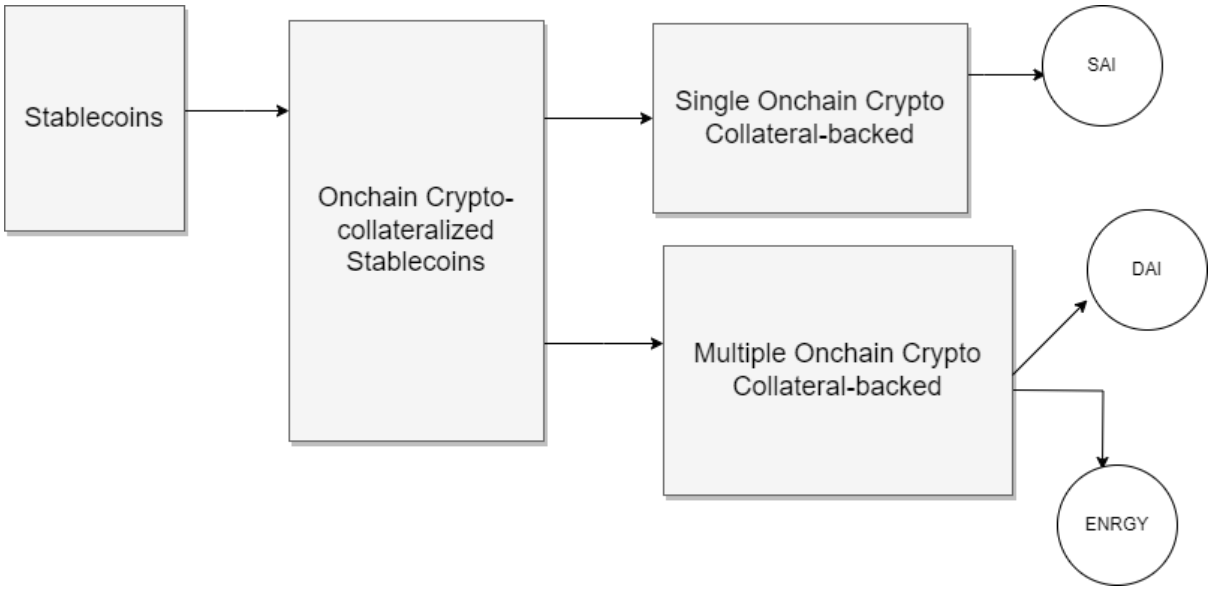
**September 25, 2023**

# Enrgy Decentralized Stablecoin Ecosystem is being deployed on Ethereum (ERC20), Optimism, TON and Cardano blockchains initially.

**Abstract**: Enrgy (Ticker: ENRGY) is a tokenized cross-blockchain stablecoin ecosystem powering a decentralized stablecoin issuer DAO and Field is the crypto bank protocol token representing its underlying overcollateralized reserve fund. Field reserve tokens (RCs) of the reserve fund are used to mint ENRGY stablecoins (SCs) pegged to stabilized prices of target assets/indexes e.g. US dollar, Euro, Swiss Franc, Chinese Yuan (Renminbi), Gold (1 gram of gold) and CoinMarketCap Fear & Greed Index.




**Enrgy is a privacy-centric multichain stablecoin backed by onchain cryptoassets**

## The Table of Contents

## Introduction

Enrgy was inspired by Djed algorithmic stablecoin of Input Output Global deployed on Cardano blockchain.

The key benefits of Enrgy are as follows:

1. Multichain support for Ethereum, TON, Optimism (a Layer2 chain of Ethereum) and Cardano;
2. Overcollateralized 100% to 800% algorithmically set crypto-collateral backing;
3. Automated algorithmic stability mechanism controlled by a decentralized DAO;
4. Enabling private confidential transactions by hiding balances and payer-payee data by implementing zkSNARK in the second iteration(V2) of ENRGY protocol by mid-2024.

## Technical Overview

1. This section of the whitepaper describes Enrgy, a crypto-backed algorithmic stablecoin contract. Enrgy acts as an autonomous decentralized bank, keeping a reserve R of BaseCoins (BCs), and minting and burning StableCoins (SCs) and ReserveCoins (RCs) aka Field tokens. It maintains the peg of the SCs to a target price by buying and selling SCs, using its reserve. While doing so, it charges fees and accumulates them in its reserve. The beneficiaries of this revenue stream are ultimately the RC holders, who contribute with additional funds to the reserve and take the risk of price fluctuation.

2. The target price of an ENRGY SC is denoted $P_{SC}^t$. For example [3], in the case of a stablecoin pegged to some peg currency PC (e.g. EUR, USD, ...):

$$P_{SC}^t = X_{BC}^{PC} BC$$

where $X_{BC}^{PC}$ is the price of 1 unit of the peg currency in BCs.

Because Enrgy's reserve may be insufficient to buy back all stablecoins for the target price, Enrgy sets the actual price PSC of SCs according to the following equation:

$$P_{SC} = \begin{cases} P_{SC}^t & \text{if } N_{SC} = 0 \\ \min\left(P_{SC}^t, \frac{R}{N_{SC}}\right) & \text{otherwise} \end{cases}$$

where $N_{SC}$ is the number of stablecoins in circulation.

3. *Enrgy does not need to be pegged to a fiat currency. It just needs a target price. The target price could be a weighted average of the price of a volatile asset, a stock index, an inflation index, a crypto market index such as Fear & Greed Index of coinmarketcap.com . . .*

The portion of Enrgy's reserve that would need to be used to buy back all stablecoins is known as its liabilities:

$$L(N_{SC}) = N_{SC}P_{SC}$$

Because PSC is volatile, Enrgy strives to keep a high reserve ratio:

$$r(R, N_{SC}) = \frac{R}{L(N_{SC})}$$

Enrgy does so by having a minimum reserve ratio $r_{min}$ and disallowing users from buying SCs or selling back RCs if, after these actions, $r(R, N_{SC}) < r_{min}$. To prevent dilution for the RC holders, Enrgy also has a maximum reserve ration $r_{max}$ and disallows users from buying more RCs if, before or after the purchase, $r(R, N_{SC}) > r_{max}$; unless $N_{SC} < N^*_{SC}$, where $N^*_{SC}$ is the *threshold number of stablecoins* parameter[4]. Note that, even though

Enrgy disallows some types of purchases and sales when the reserve ratio is above the maximum or below the minimum, the reserve ratio may still go above the maximum or below the minimum due to price fluctuations.

The reserve surplus is Enrgy's equity:

$$E(R, N_{SC}) = R - L(N_{SC})$$

Enrgy's equity is shared equally among RC holders, and thus the target price of RCs is:

$$P^t_{RC}(R, N_{SC}, N_{RC}) = \frac{E(R, N_{SC})}{N_{RC}}$$

where $N_{RC}$ is the number of RCs in circulation.

However, the target price is undefined when $N_{RC} = 0$ and a price equal to 0 when $E(R, N_{SC}) = 0$ would be problematic, because users would be able to buy an arbitrary number of RCs without any cost. Therefore, Enrgy sets the actual buying price $P^b_{RC}$ according to the following equation:

$$P^b_{RC}(R, N_{SC}, N_{RC}) = \begin{cases} max(P^t_{RC}, P^{min}_{RC}) & \text{if } P^t_{RC} \text{ is defined} \\ P^{min}_{RC} & \text{otherwise} \end{cases}$$

where $P^{min}_{RC}$ is a parameter of Enrgy.

From the user's point of view, there are 4 actions:

| Action | User Sends | User Receives | Condition[5][6] |
|---|---|---|---|
| Buy SCs | $n(1 + fee)P_{SC}$ | $n$ SCs | $r(R, N_{SC}) \geq r_{min}$ |
| Sell SCs | $n$ SCs | $n(1 - fee)P_{SC}$ | |
| Buy RCs | $n(1 + fee)P^b_{RC}$ | $n$ RCs | $r(R, N_{SC}) \leq r_{max}$ or $N_{SC} < N^*_{SC}$ |
| Sell RCs | $n$ RCs | $n(1 - fee)P^t_{RC}$ | $r(R, N_{SC}) \geq r_{min}$ |

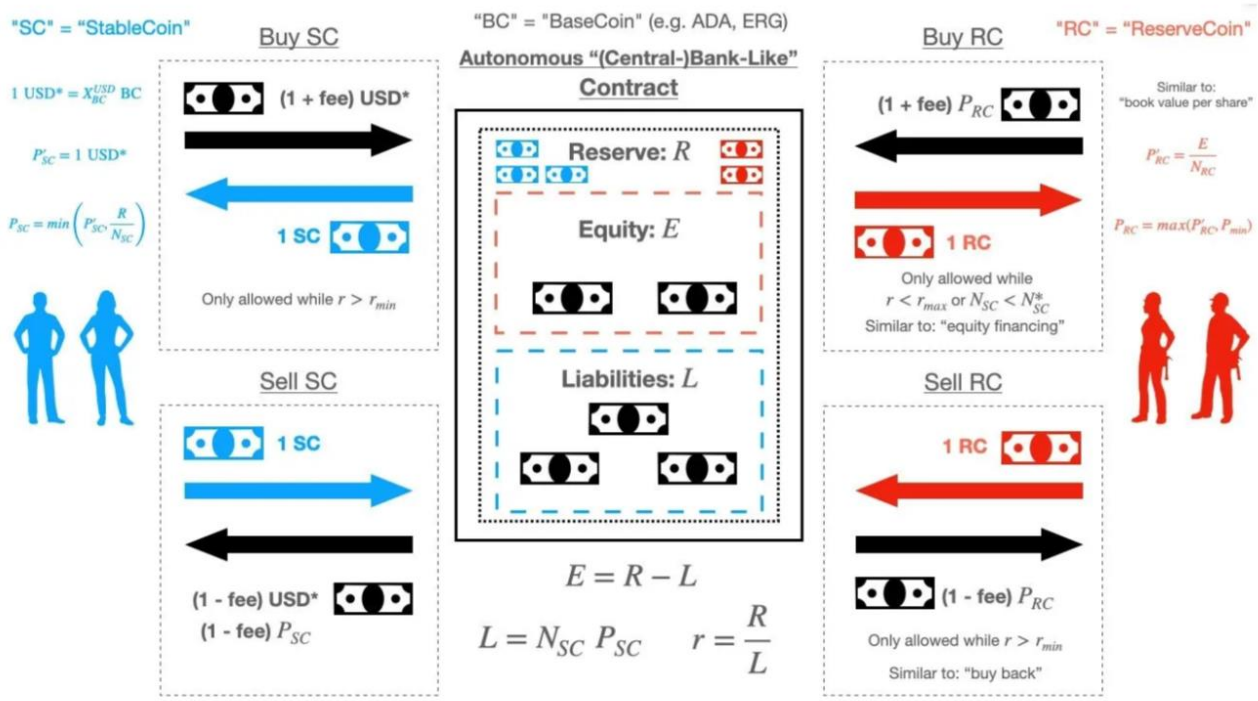
Enrgy has got the following 3 state variables:

$(R, N_{SC}, N_{RC})$ and 5 parameters $(r_{min}, r_{max}, fee, N^*_{SC}, P^{min}_{RC})$.

Enrgy also depends on one (and only one) external variable: the oracle exchange rate $X^{PC}_{BC}$. The models and formalizations assume that $X^{PC}_{BC} > 0$. This is a reasonable assumption[7], because $X^{PC}_{BC} = 0$ (or, worse, $X^{PC}_{BC} < 0$) would imply that the value of the peg currency has collapsed. In such cases, a stablecoin pegged to it would be worthless anyway.

Enrgy inherits stability properties and algorithms of Djed as described in the following technical whitepaper (downloadable using the link here): https://eprint.iacr.org/2021/1069.pdf

The public Beta version of Enrgy protocol will implement zkSNARK-based privacy features to hide users' account balances and payer-payee onchain information by leveraging Railgun for dapps (https://docs.railgun.org/developer-guide/wallet/wallet-overview).



## Use Cases

Following are the primary and secondary use cases of Enrgy stablecoins:

- Long-term storage of value uncorrelated to traditional assets heavily influenced by central bankers' conflicting and chaotic monetary policies and as a hedge against inflation.
- International trade settlements outside the heavily centralized USD-dominated payment rails.
- Cross-border macro and micro payments.
- Access to blockchain-enabled DeFi yield generator markets such as Lido, Uniswap and so on.
- Universal Banking without any discrimination and Universal Basic Income.

## Roadmap

**October 2023**

**Presale of Enrgy Reserve Coins and Token Warrants starts.**

**January 2024**

**Development and testing of key Enrgy Money Protocol Alpha version(V1) on Ethereum (ERC20), Optimism, TON and Cardano blockchains. Hiring full-time software project managers.**

**August 2024**

**Enrgy Protocol Public Beta(V2) release with zkSNARKed privacy features by integrating with Railgun**

**December 2024**

**Enrgy Protocol will be deployed on three to five public blockchains in addition to Ethereum mainnet, Optimism, TON and Cardano.**

## Team

Our core team members comprise of four members with complementary skills and capabilities.

Ranga Iyengar is a blockchain developer leading our implementation strategies.

Rehn Timer is a blockchain architect and system designer leading overall long-term grand strategies of Enrgy protocol ecosystem.

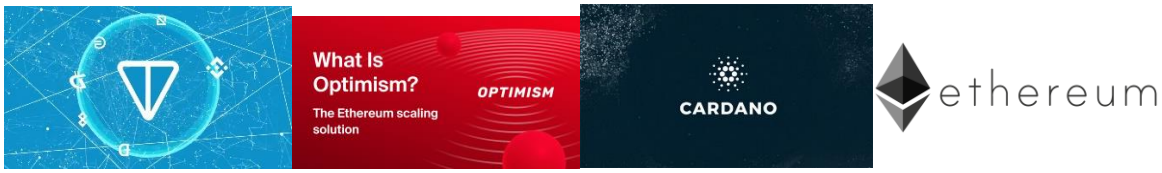
Sumrit Arora is our full-stack blockchain engineer.

Hector Prince is our frontend UX developer.

Nikhil Furtado is our chief evangelist. He is a growth hacker.

## Partners

We are partnering with the following blockchain ecosystems and organizations initially:




## Tokenomics

The basic tokenomics including token supplies of both Enrgy stablecoins (SCs) and Field reservecoins (RCs) being deployed on TON blockchain followed by Ethereum (ERC20), Optimism and Cardano are as follows:

**Initial Supply of Enrgy Stablecoins**: 3,750,821

**Initial Supply of Field Reservecoins**: 31,455,605

**Base Reserve (100% to 800% algorithmically overcollaterized ratio):** 43,242,941 TON

Enrgy DAO will be issuing $ENRGY_{USD,}$ $ENRGY_{EURO}$, $ENRGY_{CHF}$, $ENRGY_{GOLD}$ and $ENRGY_{CMC}$ initially targeting US dollar, Euro, Swiss Franc, Gold==1 gram of Gold/XAU and CoinMarketCap Fear & Greed Index respectively with corresponding Field tokens (Field==ReserveCoins/RCs). Discounted Token warrants convertible into Field Reservecoins will be distributed to investors during private sales to boost their RoIs with a fair degree of certainty.

The burn/mint states of Enrgy protocol are algorithmically set, however, you can't use the number of one token Enrgy (SC) or Field (RC) to always work out the exact supply of the other. In most cases you can but there could be rare exceptional circumstances.

For example, you would imagine that Field reserves would always be somewhere between 100-800% of Enrgy, However Enrgy always allows burning so in theory but very unlikely it could be outside of those ranges, plus price of the protocol tokens of blockchains e.g. TON/ETH/ADA where Enrgy is being depoloyed also affects the reserves ratios, when in bull markets it's possible to see above 800% reserve backing.

## Conclusions and Future Work

Enrgy is an algorithmic cross-blockchain(multichain) crypto-backed pegged stablecoin that strives to keep a reserve ratio significantly greater than one in order to guarantee the peg. This was an intentionally conservative design decision, because stability is of paramount importance and achieving stability with fractional reserves or even with no reserve (or collateralization) at all appears to be a much more elusive goal. This decision will boost pay offs for investors/token hodlers and users. In the future we will be adding sophisticated application-level features to Enrgy protocol e.g. cross-blockchain options and derivatives exchange and prediction markets linked to real world events.