e-Money Whitepaper

Revised 2019-08-20

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Executive Summary

e-Money A/S ("we", "our", "the company") is a privately held, limited liability company incorporated in the Kingdom of Denmark. We provide information about the company and its services through the website at https://e-money.com.

The company is part of a group operating since 2017 under Block Finance A/S. One such group company is Validator ApS, providing Proof-of-Stake validation for Cosmos and IRIS Hub (website at https://validator.network).

Ernst&Young ("EY"), through its Danish division specializing in Financial Institutions, are providing regulatory guidance and auditing services for the entire group of companies.

The company aims to bring unique, currency-backed tokens to market. The tokens are characterized by being:

- Fully collateralized by bank deposits and government bonds.
- Multi currency, supporting major global currencies.
- Interest-bearing (both positive and negative).
- Transparent through quarterly EY proof of funds.
- Protected by an insolvency fund to guarantee proper unwinding.

In addition to this, the company will make history by being the first to issue a token ("NGM") for the purpose of staking and reward distribution. The rewards consist of a basket of the currency-backed tokens described above.

Following two years of R&D, regulatory exploration with the Danish Financial Service Authority and partnership development with banks, the company expects to launch its currency-backed tokens in Q4 2019 on the Cosmos Network using a sovereign zone.

As we anticipate multiple services and networks will utilize the currency-backed tokens, either through IBC or peg zones, focus will be on building partnerships to reach mass adoption.

The vision driving the company is to provide equal access to transparent financial services on a global scale while greatly reducing cost.

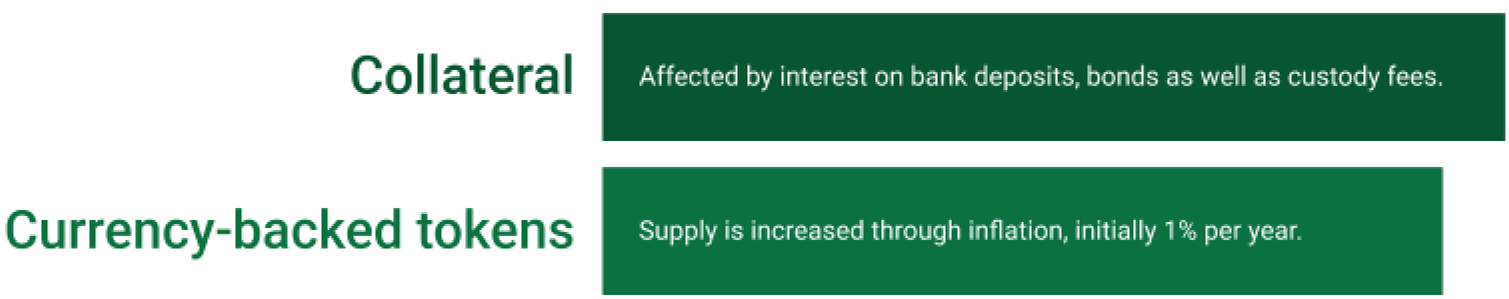
It is the expectation that advancements in technology, such as the Cosmos Hub, will drive adoption of blockchain technology to displace existing financial infrastructure. This will massively increase demand for currency-backed tokens, as adoption grows beyond the crypto communities and enters the mainstream.

Token Economics

The e-Money service consists of multiple currency-backed tokens, one for each supported fiat currency, which represent a proportional value of the collateral. To reduce counterparty risk against financial institutions, collateral is held in both bank deposits and government bonds of the same denomination as the tokens.

In addition to this, we issue the NGM token for the purpose of staking and reward distribution. This reward distribution incentivizes the ongoing operation of the service and is foundational in making the business model viable.

Finally we introduce a novel model for applying interest on the currency-backed tokens. This is accomplished through two independent mechanisms affecting both the collateral and the currency-backed tokens:



As can be seen above, the size of the collateral and number of currency-backed tokens will vary independently of each other. The only constant is that ownership across collateral and tokens is proportional. In other words 10% of tokens can be sold to receive 10% of the collateral.

The supply of currency-backed tokens is continuously increased through inflation, which is immediately distributed as rewards to stakers of the NGM token. This is a central incentive for owning and staking NGM tokens.

These mechanisms are described in further detail in the following sections. See “Competitive Landscape” for a comparison with existing stablecoins.

Currency-backed Tokens

Currency-backed tokens are intended to be used for payments between parties and as a fee token for transactions.

A key property of a currency-backed token is that it *does not* correspond 1:1 to its underlying collateral. This is due to interest accruing on the collateral without a corresponding change in the number of issued tokens. Instead an exchange rate exists between collateral and token, i.e. 1 eEUR token does not represent 1 EUR value.

This enables us to make the tokens interest-bearing, which is an advantage for token holders of positive interest currencies. Equally important, this model is sustainable for all parties through any economic climate, notably those involving negative interest rates.

Taking into account the exchange rate, the net present value of currency-backed tokens held will change in a way that is similar to traditional bank deposits.

The intrinsic value of the currency-backed tokens is supported by using the collateral to maintain a constant buy-side on exchanges. This ensures that the market value of the token tracks its underlying currency consistently.

A seller of currency-backed tokens will thus be paid a part of the collateral, that is proportional to the amount of tokens sold out of the total issuance.

Our ambition is to support a large number of major currencies, where the properties of each token is similar to this example based on EUR:

Identifier:	eEUR.
Supply:	Unlimited.
Purpose:	Tokenization of EUR held in bank deposits and government bonds. Used as a payment and fee token.
Classification:	Currency token.
Rights:	Does not represent a claim on the issuer.

	Provides no governance rights.
Trust anchor:	Sovereign e-Money zone.

Utility Token (NGM)

The company monetizes its activity by receiving staking rewards. Staking rewards are created by inflating the supply of currency-backed tokens by 1% per year, irrespective of bank and bond interest rates and the collateral held.

Without any preference or special rights towards the company, these rewards are then *fully distributed* pro-rata among staked NGM token accounts. These accounts thus receive staking rewards in the form of a basket consisting of all currency-backed tokens.

The operations of the company will be fully funded by staking rewards received through its NGM holdings. The company initially owns all NGM tokens but intends to sell a portion of these in order to bootstrap its business and ecosystem.

Events that relate to the collateral, such as interest accrual or custody fees, only affects the amount of collateral held but not the amount of currency-backed tokens. As such, both positive and negative interest accrued for a given currency, will affect the collateral and thus the exchange rate against the currency-backed token.

Identifier:	NGM (“Next Generation of Money”)
Supply:	100,000,000 fixed.
Purpose:	Staking and reward distribution.
Classification:	Utility token (preliminary).
Rights:	Staking rewards.
	Provides no governance rights.
Trust anchor:	Sovereign e-Money zone.

In summary, a staked NGM token represents a proportional claim on all future staking rewards consisting of currency-tokens. To illustrate this with an example, an entity staking 5% of NGM tokens receives 5% of the currency-backed tokens created as staking rewards, irrespective of the size of the collateral. The value of each NGM token thus scales with the size of the collateral.

Examples

The following exemplifies the material covered in the previous sections.

Example 1: EUR-backed tokens

As an example, let's imagine that the collateral consists of EUR 100,000 held in bank deposits with a negative interest rate of 0.5% per year. For the purpose of the example, the collateral is the result of selling 100,000 eEUR tokens, coincidentally making the exchange rate 1:1. After the first year, the collateral is now EUR 99,500. In the same period of time, the number of eEUR tokens have increased through inflation by 1% to 101,000, the increase being distributed pro-rata to NGM token stakers. A single eEUR token thus represents 99,500 / 101,000 EUR, approximately EUR 0.985.

Example 2: USD-backed tokens

In this example, collateral consist of USD 100,000 held in bank deposits with a positive interest rate of 2.5% per year. The collateral is the result of selling 100,000 eUSD tokens, coincidentally making the exchange rate 1:1. After the first year, the collateral is now USD 102,500. In the same period of time, the number of eUSD tokens have increased by 1% to 101,000, the increase being distributed pro-rata to NGM token stakers. A single eUSD token thus represents 102,500 / 101,000 USD, approximately USD 1.015.

Strategic Partner Sale

The company is seeking to sell up to NGM 20,000,000, i.e. 20% of future staking rewards, to strategic partners. The sale is intended to:

- Expand the validator set for our e-Money zone.
- Provide medium-term financing to cover operating costs.
- Accelerate expansion in number of supported currencies and regulatory regimes.
- Materialize partnerships with banks, networks, exchanges, wallet providers, integrators, etc.

Grants

Grants are offered in NGM tokens to qualified partners, subject to vesting periods.

The tokens offered are provided by e-Money A/S and does not affect the allocation for the strategic partner sale. Applications are considered on a continuous basis.

Partners in the following categories are eligible to receive grants:

- Validators for the e-Money zone.
- Wallet providers committing to integrating NGM and all future currency-backed tokens.
- Exchanges committing to listing the NGM and all future currency-backed tokens.
- Applications using our currency-backed tokens.

Project descriptions can be submitted to partners@e-money.com to initiate the dialogue.

Roadmap

The initial approach to getting the currency-backed tokens into circulation, is to provide liquidity on partner exchanges. In practice, this means that the company will act as primary market maker on these exchanges, by creating both buy and sell sides for the tokens according to the current exchange rate.

Parties interested in trading larger volumes of currency-backed tokens have the option of dealing directly with the company using OTC ("over the counter") trades. Contingent on banking relationships, the company plans to expand its OTC trading activity to include smaller clients.

Our continued focus will be on making our currency-backed tokens widely usable and available. This work consists of establishing partnerships to boost adoption and at the same time strengthening our integration with the existing financial system.

Use Cases

The following sections outline potential uses of our currency-backed tokens, some of which obviously require increased mainstream adoption.

We expect that individuals and businesses will migrate towards ecosystems offering low cost, low friction payments and immediate settlement.

Initially we anticipate our early adopters will be found in the Cosmos ecosystem, where many projects[1] are currently under active development.

The Global Citizen

The maturity and access to financial services vary greatly across the globe. Even in highly developed countries, having access to a bank account is not a given.

Therefore we see great value in offering network accounts with currency-backed tokens as a faster, cheaper and globally accessible alternative to a bank account.

We envision that global citizens will reduce their dependence on the traditional banking and payments industry over time, as ecosystems such as Cosmos grow and gain mainstream adoption.

[1] See https://cosmos.network/ecosystem and the community maintained list https://forum.cosmos.network/t/list-of-projects-in-cosmos-tendermint-ecosystem/243.

Enabling the Network Economy

Our currency-backed tokens have the potential to scale with the Cosmos ecosystem, as our token model does not require restricting the movement or use of the tokens across zones.

Combined with the permissionless access for new zones and services to Cosmos Hub, anyone is free to adopt our tokens as a means of payment and store of value.

Empowering Local Businesses

Startup costs for local businesses, such as the corner coffee shop, can be greatly reduced by removing the need for credit card hardware and acquirer relationships.

The fees charged per transaction by many credit card companies impose a significant cost on the business that eats into their margins. Many also operate with a minimum fee, making smaller transactions unviable.

As small businesses are typically strained on their liquidity, they also benefit from the immediate settlement inherent in blockchain technology.

Reducing Friction for Global Trade

As global trade relies heavily on cross border payments, they constitute an obvious application of our currency-backed tokens and technology.

Immediate settlement, low cost and full transparency is a marked improvement compared to using traditional bank transfers.

NGOs

NGOs are typically tasked with disbursing small amounts of money to a large number of recipients, often within a short period of time.

The transparency inherent in blockchain technology, coupled with the low fees and immediate settlement offered by our service, make our platform ideally suited for NGOs.

Corporate Settlement

Large corporations spend vast amounts on fees for payments between branches using the traditional banking infrastructure.

Apart from reducing (or ideally removing) fees, corporates also greatly benefit from having funds immediately available.

e-Money Zone

As one of the intended use-cases of the zone is real-world payments between parties, it is imperative that the zone maintains high availability and deterministic, low transaction times.

For end users, our ambition is to provide an experience that is better than or comparable to existing mobile and card-based payment solutions. This experience also applies to transaction fees being almost free, which is made possible by our business model being independent of these.

For participating validators this translates into:

- Commission charged on staking rewards is the main revenue source.
- Currency-backed tokens are used for fees.
- Quick jailing of offline validators to ensure deterministic block creation times.
- Validators can voluntarily enter maintenance mode to temporarily leave the validator set and avoid jailing.

To improve response times, the consensus layer will be configured for immediate block creation when a transaction is pending. When there are no pending transactions, a heartbeat block will be created every minute.

A Note on Centralization

The currency-backed tokens, representing real-world assets, require a legal entity to operate and are thus inherently centralized. This is in part due to the fact that bank relationships must be established and maintained while ensuring compliance.

Consequently the company ultimately decides which chain accurately reflects the valid zone state, as this state is intimately tied with the collateral.

The initial NGM token distribution reflects this with 100% of tokens owned by e-Money A/S. While the company plans to disperse 20% of the token through the strategic partner sale we expect the distribution will remain centralized for the foreseeable future.

Tokens owned by the company will be staked across *the entire validator set*, depending on factors such as infrastructure security, availability and commission levels.

Jailing and Slashing Conditions

Key objectives of the zone are security, availability and responsiveness. As such, there will be low tolerance for validators that are offline, since this leads to an increase in consensus rounds and higher transaction times.

Validators that are jailed will not be slashed. They will, however, need to pay a penalty fee to un-jail which comes from their own pockets. Jailing parameters will be set aggressively to ensure continued availability within short timeframes, e.g. 5 minutes.

As validators will want to avoid jailing in relation to planned maintenance, they can remove themselves voluntarily and temporarily from the validator set by submitting a transaction.

Double-signing leads to slashing subject to parameters and tombstoning of the validator.

Proceeds from slashing and un-jailing activities are evenly distributed to validators in the validator set.

Risks

Designing our token model with a built-in interest mechanism eliminates most risks related to the macro-economic situation for the token's underlying currency. This ensures that business continuity is independent of general factors such as central bank interest rates, even in the event of another financial crisis.

Anchoring the tokens to the traditional financial system adds some risks with the banking relationships. Establishing sustainable partnerships with banks that are comfortable with the crypto-space will be an on-going effort. We seek to minimize this risk by establishing several banking relationships for each currency.

Credit risk towards banks holding deposits will be mitigated by placing part of the collateral into low-risk government bonds without exchange rate risk.

The company has spent considerable time and resources on clarifying its regulatory status within the EU. While the process has reached its conclusion, there is always a risk that lawmakers will increase regulation of crypto-currencies and blockchain technology. To mitigate this risk we are retaining legal counsel and advisors who work at the forefront of EU financial regulation.

On the technology side, the Cosmos stack has proven its worth during audits, adversarial testnets and in production. Building on this stack, we will expose any modifications to peer review audits. In addition, penetration testing will be conducted on live testnets.

Competitive Landscape

As blockchain technology has matured and begun its journey towards mainstream adoption, attention is shifting towards mitigating the value fluctuations seen in traditional crypto currencies, as this presents a major obstacle to adoption for most non-speculative purposes.

While it is still early days, a number of projects and businesses already focus on introducing price stability into the blockchain space. These projects can roughly be divided into algorithmic and collateralized stablecoins, with our currency-backed tokens being a subset of the latter.

Algorithmic Stablecoins

Algorithmic stablecoins attempt to maintain a peg to one or more fiat currencies, with current offerings creating an evolving and versatile solution landscape. Some are essentially credit facilities that rely on an over-collateralisation of crypto assets. Other rely on a continued growth in user adoption and flow of transaction fees to support their price peg. The latter is most often contingent on controlling the entire technology stack all the way to the end user, consequently restricting usage within decentralized finance.

Notable examples include MakerDAO, Haven and the now defunct Basis. Within the Cosmos ecosystem, Terra has recently launched a zone targeted at the Asian market.

The main weaknesses of crypto collateralized stablecoins are:

1) They lack the purchasing power required to support their peg without exchange rate risk (they don't have collateral in the form of the instrument they are trying to peg).
2) Over-collateralization is also inherently ineffective, essentially being a bet that the value of the collateral will not decrease substantially.
3) There is no frictionless way to move between fiat and token, it always incurs trading costs and crossing the spread.

To summarise, the engine of an algorithmic stablecoin requires fuel in the form of collateral or economic activity (e.g. transaction fees) to maintain its value.

Collateralized Stablecoins

Collateralized stablecoins maintain a reserve consisting of bank deposits and/or government bonds in the same denomination as the issued tokens, thereby eliminating exchange rate risk. Notable examples include the Tether, Circle and Gemini USD tokens along with Stasis EUR. TrustToken also provides a range of currencies.

These examples all share the goal of maintaining a 1:1 peg against a fiat currency, effectively making the token similar to cash. We anticipate that this model will be unsustainable in low- or negative interest environments, such as the Euro zone and Japan. In these environments issuers will be driven to take on additional risk, tap into the reserve or charge issuance/redemption fees to cover their costs.

In contrast to algorithmic stablecoins, it is important to note that collateralized stablecoins promise to maintain a 1:1 peg to the fiat currency by buying back tokens using the reserve. Assuming the reserve remains intact, this is trivial since there is no exchange rate risk.

As collateralized stablecoins rely on the traditional banking infrastructure, their main weaknesses are maintaining banking relationships and the ability to cover operating costs from interest on the reserve.

Currency-backed Tokens

The currency-backed tokens introduced by e-Money are a further iteration on the concept of collateralized stablecoins.

In contrast to these, our tokens are interest-bearing and thus have more in common with a bank deposit than cash. As such they are more resilient to changes in the economic climate, while offering benefits to owner of fiat-backed tokens with positive interest.

A key difference is that our currency-backed tokens do not promise a 1:1 peg against a given fiat currency. Instead the exchange rate will vary depending on the interest accrued on the reserve. Use of the tokens in a service or application requires these to look up the current exchange rate in order to display an accurate fiat value to the user. Ideally, most users will never concern themselves with the actual amount of tokens in their balance, but rather with the fiat value it represents.

In contrast to some algorithmic stablecoins, our business is not reliant on controlling the entire stack, e.g. collecting transaction fees on payments, or the success of any crypto asset. In addition to this, the business model does not rely on fees related to issuance or redemption.

In summary, our interests are perfectly aligned with those of Cosmos and other interoperability projects. The utility of our tokens increase with the growth of the ecosystem. We anticipate that services will adopt our tokens as a means of payment and users recognize it as a store of value.

Disclaimer

This whitepaper and any other documents published in association with this whitepaper relate to the intended development of the service and associated tokens. They are for information purposes only and may be subject to change.

Subject to Change

This whitepaper contains forward-looking statements that are based on the beliefs of e-Money A/S, as well as certain assumptions made by and information available to said company.

Even though the technology described in this whitepaper is currently being implemented, but might still be subject to change. This includes, but is not limited to key economic and technical aspects.

If and when the service is completed, it may differ from what is described in this whitepaper. No representation or warranty is given as to the achievement or reasonableness of any plans, future projections or prospects and nothing in this document is or should be relied upon as a promise or representation as to the future.

Not an Offer of Regulated Products

The NGM token is not intended to represent a security or any other regulated product in any jurisdiction.

The tokens do not represent equity, shares, units, royalties or rights to capital, profit, returns or income in e-Money A/S or any other company or intellectual property associated with the service in any jurisdiction.

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Obtain All Necessary Professional Advice

You must consult a lawyer, accountant and/or tax professional, as well as any other professional advisors, as necessary prior to determining whether to purchase NGM tokens or otherwise participate in the service.