



Shakti Coin

The Global Game Changer

WHITE PAPER

Version 1.0 (April 18, 2019)

Contents

INTRODUCTION.....	3
PART I: THE SHAKTI COIN CONCEPT.....	7
1. SHAKTI COIN AT A GLANCE	8
2. GOVERNANCE	11
3. PROTOCOL.....	13
4. WALLETS & VAULTS	16
5. MANAGEMENT	19
6. VALUE & EXCHANGE	23
7. TRANSACTION FEES.....	24
8. MINING	25
PART II: MINING SHAKTI COIN.....	27
9. A NEW APPROACH TO MINING	28
10. THE DEMOCRATIZATION OF MINING	30
11. BUILDING ON TRUST	33
12. MINING FOR SOCIAL GOOD	35





INTRODUCTION

Introducing Shakti Coin:

The World's Most Practical Currency

Money is not practical. Bills and coins were an innovative solution to problems that faced society centuries ago. Today they are relics that no longer fit, much less serve, today's lifestyle. Traditional money is hard to keep securely, it's hard and expensive to send, it's risky to transact with online, it's a hassle to use across international borders, and for many, it's restrictively difficult to borrow or lend, especially in small amounts.

Against that backdrop, our journey began in March of 2015 with an engineer sending a remittance to his relatives overseas. The transaction was slow, costly, and unpredictable. "There must be a better way" quickly lead to a second thought: "What if...?"

One conversation led to another. Soon, the idea of creating better money began to take on a life of its own. What if money could be sent around the world instantly, peer-to-peer, for a few pennies? What if lending or borrowing even small amounts were fast and simple enough to do over a smartphone? What if we didn't have to worry about exchange rates? What if money were more secure and easier to save, spend, or invest?

Blockchain's Untapped Potential

Of course, the concept of a universal digital currency has been around since the early 1980's. But it wasn't until 2008 when Satoshi Nakamoto applied the idea to distributed ledger technology, called blockchain, that a true global digital currency seemed plausible. Now that we have the ability to create smart money, it just seems dumb not to.



Blockchain can remove friction points from financial interactions in the same way that the internet removed friction points from business and social interactions two decades ago. As with the internet, eliminating costs, efforts, and time constraints associated with money can have positive and transformative effects for all people and society as a whole.

Which is why we have written this white paper. While many blockchain-based currencies have been launched since Nakamoto's white paper, none fully harness the technology's capacity for social good. Shakti Coin is changing that and we're asking for your help.

Smarter by Design

Shakti Coin is intended to be the world's most practical cryptocurrency. That's because from day one it was designed to serve the needs of ordinary people. We've made it easy, immediate, and inexpensive to use. It's also based on a new protocol called Proof-of-Effort (PoE). PoE rewards parents, children, and communities that support education. In a very real sense, every Shakti Coin mined represents an investment in humanity's intellectual capital. Now that's smart money.

The Time is Now

The global economy needs a global currency. Blockchain technology has made it possible to create such a medium of exchange for virtually frictionless transactions between any two people globally. In this paper, we offer a smart solution that incentivizes the inclusion of all people and crosses borders effortlessly.

Some highlights of Shakti Coin:

- Stable value
- Pegged to the USD
- KYC / AML / CTF Compliance
- Entirely new protocol
- Wallet-to-Wallet transfers
- Smart contracts
- 10,000+ Transactions Per Second (TPS)
- Democratized mining
- Negligible energy consumption

Proof-of-Effort (PoE)

The key tenet behind the Shakti coin is the Proof-of-Effort (PoE) Protocol. This is a revolutionary concept that stimulates local economies. It does this by rewarding a common behavior that creates the foundation for a healthy economy — sending children to school.

This unsung act is performed by millions of people each morning. For many reading this paper, the effort required to see that children attend school is a routine that is taken for granted. But, unfortunately, that sentiment is not universal. Shakti Coin acknowledges the importance of education. Compared to other mining protocols, PoE uses education as a more relevant and beneficial basis for mining coins.

Bigger Picture

Shakti Coin is simply better money. That, in and of itself, is reason enough to support the project. But there are other big-picture benefits to consider as well.

Many hands make light lifting. Today we have 7.6 billion people inhabiting the planet. By 2050 that will grow to almost 10 billion. That's a lot of hands. But how many of them will actually be lifting? That is, contributing to society in a meaningful way? Two basic prerequisites to contributing are inclusion in the educational and financial systems. But today it is estimated that 2 billion people are not involved in either.

Those who are uneducated and unbanked can't lift very much and, in some cases, simply weigh things down. This contributes to the circle of poverty that keeps generations of parents and children from developing the talents they were born with and contributing to society at their potential. It also contributes to a growing sense of disenfranchisement, alienation, resentment, and division. Those feelings, starting in childhood, also provide barriers to meaningful contribution. In fact, they often foster the opposite. There is a smarter way.

Imagine if the next generation could enlist the intellectual and financial contribution of today's uneducated and unbanked. An additional 2 billion people lifting would surely lighten the load for all. If we want to see better local, national, and global distribution of wealth, then we need a legally-compliant financial infrastructure to make that happen. The Shakti Coin project will contribute here as a major catalyst for positive social change.

About this White Paper

Our vision is a world where the financial and educational inclusion of all citizens fosters global peace, shared prosperity, and audacious dreams. These are not pie-in-the-sky ideas. It is a shared reality that we can make together if we have the will to do so.

This white paper makes the case for doing just that.

- Part I provides an overview of the concept and project.
- Part II takes a closer look at how Shakti Coin is mined.
- Part III is the math behind the protocol.
- Part IV makes the economic case for why Shakti Coin is needed.

About the Shakti Coin Community

Our group exists independent of any affiliation with industry, government, religion, or political party. It is, in every sense of the term, a diversified grassroots organization. The only thing that members of the Shakti community have in common is the audacity to believe that working together we can make a positive difference for all people — everywhere.

In 2019 the Swiss Shakti Foundation was established in Zug, Switzerland with the aim of bringing Shakti Coin to the world. This white paper is the first step in that process. We welcome all. Get to know us. Provide us with your input. If you believe in what we're doing, then join us. Let's dare to see what kind of difference we can make together.

Part I

The Shakti Coin Concept



ShaktiCoin



1. SHAKTI COIN AT A GLANCE

1.1. Name

Shakti – Sanskrit for “empowerment.” The primordial cosmic energy and boundless potential all beings are born with.

1.2. Type

A decentralized, blockchain-based, digital currency (a.k.a. cryptocurrency).

1.3. Fixed Value

Shakti has been engineered to have a stable value that is pegged to the US Dollar (a.k.a. stable coin). One Shakti Coin is equal to five US dollars.

1.4. Protocol

Based on an entirely new protocol called Proof-of-Effort (PoE) where, in this case, the effort being proven is school attendance each day.

1.5. Trust

All participants in the Shakti Network will be known on the blockchain. All transactions occur in real time, cryptographically secured, verifiable, transparent, and instantaneous.

1.6. Difference

A third-generation blockchain-based digital currency that has been purpose-built to be an easy-to-use global medium of exchange for the average person.

1.7. Vision

A smarter world, where the financial and educational inclusion of all citizens enables global peace, shared prosperity, and audacious dreams.

1.8. Mission

To bring blockchain-based currency mainstream with the world's most useful medium of exchange.

1.9. Backers

A global, grassroots movement comprised of parents, educators, students, and blockchain enthusiasts who believe that working together they can make a positive difference for all people everywhere — with no affiliation to any industry, government, religion, or political party.

1.10. Location

The Shakti Foundation has its global headquarters in Zug, Switzerland with compliance and operations handled through the SXE Network Operations, LLC located in Berkeley, California, USA.

1.11. Mining

Open to all Shakti wallet holders, mining Shakti Coin is a cooperative effort where coins are mined when communities pull together to ensure the education of their young.

1.12. Community Focus

Proximity-based mining means that local miners get first dibs on verifications originating in their community thus allowing the local community to keep more of the value it creates.

1.13. Self-regulating

A built-in rating function will allow users to rate merchants when exchanging Shakti Coin for goods and services. This feature provides a self-correcting mechanism within the Shakti ecosystem that requires merchants to honor the stated value of the coins and will organically help establish a stable market.

1.14. Energy

The PoE protocol does not require large amounts of electricity to run. The energy required for mining is similar to running an email server.

1.15. Crypto Symbol

SXE

1.16. Denominations and USD Equivalent

Shakti

One Shakti is equal to five dollars US (\$5.00).

Chai

One Chai (0.01 SXE) is equal to five cents US (\$0.05). It takes 100 Chai to equal one Shakti.

Toshi

One Toshi (0.00001 SXE) is equal to five-thousandths of one US cent (\$0.00005). It takes 1,000 Toshi to equal one Chai.

1.17. Payments and Remittances

Everyone in the Shakti Network has a wallet and can send or receive Shakti Coin directly, Wallet-to-Wallet, anywhere in the world.

1.18. Lending

Everyone in the Shakti Network can easily give or receive loans with smart contracts built into the network.

1.19. Smallest Transaction

One Chai is the minimum amount that can be transacted between wallet holders and reach consensus within the Shakti Network — a value of 5 cents US.

1.20. Fees

Transactions fees are collected but are minuscule in comparison to any other option available today. Over 90% of all transactions will cost less than three cents. The majority of these fees go to miners. The remainder is used to maintain network compliance.

1.21. Transaction Speed

The system will operate at 10,000 transactions per second (TPS). The TPS will improve as the network expands and matures over time.

1.22. Legal Compliance

Shakti Coin strives to protect the societies it serves by embracing FinTech best practices with regard to anti-money laundering (AML), know your customer (KYC), and counter-terrorist financing (CTF).



2. GOVERNANCE

2.1. Shakti Foundation

The foundation is a non-profit organization located in Zug, Switzerland. The Shakti Foundation is the keeper of the project's vision and mission. It ensures the project stays on course and does not lose its way over time. The Shakti Foundation provides oversight and guidance to the Shakti Network and to Shakti Network Operations.

2.2. Shakti Network

The network refers to the technical web of software and hardware that performs all the functions required of a digital currency such as running the PoE protocol, registering members, providing wallets, tracking transactions, maintaining accounts, enforcing smart contracts, and validating transactions. It also refers to the global network of participants — all the people who have a Shakti Wallet and, therefore, can participate in the network.

2.3. SXE Network Operations, LLC.

The LLC is an American company that specializes in building the Shakti network. Under a mandate from the Swiss Shakti Foundation, the LLC is responsible for all operations in support of the Shakti Network including day-to-day maintenance of the network, compliance with applicable laws and regulations, promotion of the network, recruitment of participants, and member services.

2.4. SXE Network Inclusion

Anyone can join the SXE Network once their KYC information has been verified. The SXE Network is intended to represent participants from all walks of life regardless of nationality, creed, or socio-economic class.

Likewise, mining opportunities are also open to all. Individual miners do not require dedicated “mining rigs” to participate. Miners are compensated in transaction processing fees for their computer presence on the Shakti Network to build the blockchain and reach consensus.

2.5. Monetary Protocol Amendments

Shakti Coin Wallet Holders are, by default, members of the Shakti Coin (SXE) Network. They can shape the SXE Network Monetary Protocol by putting forward their proposed changes.

SXE Network members can propose new offerings, services, and introduce modifications to the existing services, such as the cost of transactions, inflation, modifying liquidity reserves, redirecting excess liquidity reserves to be invested in the emerging sectors, and if and when necessary, democratically reviewing and re-affirming Shakti policy.

Services can be introduced, modified, and/or eliminated by proposing to reach consensus on the SXE Network. Any such resolution must be approved in each region by SXE Network members that represent at least 60% of the SXE value in that region. This will ensure that governance is equally distributed globally and that any changes represent the interests of all parts of the SXE Network.



3. PROTOCOL

3.1. Proof-of-Effort

A new protocol has been developed to support the Shakti Network. If we compare it to the most widely-used cryptocurrency protocol in use today, Proof-of-Work (PoW), we can see that it is fundamentally different.

Unlike with PoW, Shakti Coin is not mined through computational achievement but rather through human achievement in the advancement of education. That is, a new coin is mined when a child's daily attendance at school has been verified by the network. The coin is then provided to the parents of the child.

The network's ability to certify the child's attendance in school is essential and is a minimum requirement of the PoE Protocol. Eligibility ranges from age 5 to 21 for any child participating in a recognized educational institution or, under special circumstances, receiving an alternate form of education.

The protocol supports expanding the number of actors involved in validating attendance for PoE Certification. Schools, NGOs, and Independent Validators will be the primary certification authority to attest. However, there could also be transportation providers (where applicable and available), teachers, and other service providers such as school meal providers or crossing guards who could also participate.

Parents (or the legal guardians) of the child also play an important role in the PoE Certification. The actors identified above will have to certify and validate attendance in order for the child's parents to earn the Shakti coin. However, the parents themselves must make the daily effort to ensure their children's school attendance.

Independent validators will certify the effort of parent and child as evidenced by school attendance. Of course, these validators will also require compensation for their efforts. To compensate the validators for their efforts, they shall earn micro-payments. Five Hundred Toshi (2.5¢) is shared among the actors that provided the validation data required for PoE Certification for each Shakti Coin mined.

3.2. Distribution of Shakti Coin

Shakti Coins are mined and distributed to parents for their efforts to support their children's education. One SXE per child is granted to the parent's wallet on a daily basis pending proof of school attendance.

3.3. PoE Difficulty Level

The PoE difficulty level is set from the lowest to the highest classification of 1 to 8. Please refer to Part III of the White Paper for a detailed discussion of this concept.

A child's PoE validation is reviewed at each level of difficulty to detect data inaccuracy, potential fraud, and to correct any other data entry anomalies which will be identified as the PoE Protocol matures. Furthermore, the number of Shakti Network validators that are required increases with each difficulty level. This is because, as the student grows older, the validation and attestation requirements become more rigorous.

Parents and children are allowed to choose among validators as they see fit. This feature allows parents and students to "validate the validators," enabling the Shakti Network to reward and support service-conscious participants.

Thus, we have created a peer-to-peer market that is organic, a system that facilitates the evolution of a Shakti Exchange for learning, and educational services that are offered for SXE coins.

SXE Network Operations will measure the data entry anomalies caused by primary validators and the class of severity, such as:

- Data Entry Error
- Mistaken Identity
- Fraudulent Representation
- Mistaken Country of Origin

Participants in the Shakti Network will rate and flag validators who are not attentive to details and/or require training and, if required, remove them as validators altogether from the system for their inability to validate participants accurately within the Shakti Network.

3.4. Shakti Coin Granting Rules

Shakti Coins are granted to the parent as soon as the confirmation of their child's attendance at school is verified each day. This is a system-driven, autonomous process, captured by those who facilitate the children's academic advancement.

Refer to Part-III of the Shakti Coin White Paper for an in-depth mathematical analysis and to see how fraud is eliminated from the SXE Network.

Each Shakti coin will have a nominal stated value of US \$5.00 for the family to use as it wishes. As the Shakti Coin is granted to the family, SXE 0.005 is mined and distributed to those who contributed by on-boarding the child and/or helping to validate the child's attendance.

3.5. Protection from Bad Actors

One can confidently state that the Shakti Network will not be an attractive place for bot, high-frequency algorithmic trading, and any other emerging technology-assisted trading strategies that are designed to take advantage of unsophisticated retail entrants.

Further:

- There is no opportunity to “wash trade” Shakti Coins since wallet holders are known to the platform provider and there is no way to access Shakti Coin without being a participant within the Network.
- There is no opportunity to “spoof”, i.e., enter a deceptive bid or offer with an intent to cancel it before execution, because the value of Shakti Coin is fixed – thus there will be no price movement.
- There is also no opportunity for “layering”, i.e., when a trader enters a relatively large order to buy or sell without ever intending to follow through on the order. This is because the Shakti Network will be a confederated platform where consensus takes place upon verification of the transaction before it is recorded on the Blockchain.



4. WALLETS & VAULTS

4.1. Types of Shakti Wallets

The Shakti Network will issue two types of wallets:

- SXE Wallet for consumers
- SXE Vault for merchants

Both wallets will include a number of partitions and built-in Smart Contract functions to support Shakti Network Monetary Protocol (SNMP) policy. This is to ensure that the fundamental DNA of the Shakti Coin ecosystem is upheld.

4.2. Consumer Wallets

Anyone can obtain an SXE Wallet and join the SXE Network via the Shakti Foundation website.

Everyone who joins the network starts with the same wallet. SXE Wallets are the basic de facto wallet for all participants in the network.

Anyone can have an SXE Wallet, however, the network does not allow anonymous membership or multiple wallets per person. To obtain a wallet, the applicant must satisfy KYC requirements for fool-proof identification. Once identification is verified, the member will have a network ID and be allowed to participate.

Further, any person with a Shakti Network ID can mine SXE coins. They simply need to register with the network as a miner. Refer to white paper Part II - Mining Shakti for more information.

4.3. Merchant Wallets

Merchants have the option of upgrading their SXE Wallet to an SXE Vault. The SXE Vault is a merchant wallet with the added functionality of being able to conduct business transactions and make larger SXE transfers globally.

The SXE Vault has built-in smart-features that will help the merchant conduct seamless trade with other SXE Network Members. This is designed to reduce friction and fees for the merchant while at the same time supporting their community.

The exact function, feature, privilege, and capability of the SXE Vault may vary from region-to-region and country-to-country, in order to uphold the SNMP Policy. However, our aim is for all SXE Vault holders to be able to conduct business with other SXE Wallet and Vault holders with as little friction as possible and to encourage commerce.

4.4. Bonus Bounties

At the outset of the program, all SXE Wallet and Vault holders will be given a Bonus Bounty. This bounty will start at SXE 1,111 (equivalent to \$5,555 USD) for SXE Wallet holders and SXE 10,000 (equivalent to \$50,000 USD) for SXE Vault holders. These amounts will decrease over time as the SXE Network reaches certain recruitment goals. The purpose of the bounty is to accelerate the activity and growth within the SXE Network by incentivizing sharing.

The Bonus Bounty will be released to the wallet holder after seven years (84 months) provided the wallet holder executes at least one unique transaction per month for seven (7) years with other SXE wallet holders.

Wallet holders can reduce the waiting period by on-boarding new users to join the SXE Network. For every new user added, the wallet holder's onboard waiting period gets reduced by one month. This feature enables the wallet holder to access the bounty sooner, rather than later.

The ability to shorten the Genesis Bounty waiting period acts as an incentive for SXE Network members to onboard more users into the Shakti Coin ecosystem. But there is another incentive. When an SXE Member on-boards users to the Shakti Network, he/she also earns micro-payments. These micro-payments will create thriving, friction-free liquidity for all contributing participants.

4.5. Certified Shakti Funds

Wallet holders within the Shakti ecosystem can trigger additional protection by certifying their Shakti coins with the SXE Network at any time for a nominal fee. By certifying, the SXE Coins are protected by an additional Inter-ledger Protocol to trace transactions and the Shakti Network will be able to assist the wallet holder to recover their private key if and when such situations arise.

SXE wallet holders who wish to own secure SXE funds with enhanced capital safety can purchase and use certified SXE funds (i.e. the ability to transact using secure, traceable SXE funds for a lawful evidentiary purpose for an indefinite period of time).

Funds held within this account are safeguarded indefinitely with the Inter-ledger Protocol to cross-validate SXE movements. As such, certified funds held within the Shakti ecosystem are traceable at all times and cannot be hacked or otherwise compromised. If a wallet holder loses any account credentials and is unable to remember anything about his/her wallet, then the Shakti Network will assist the wallet holder and identify the rightful owner deterministically.

In the event that the wallet is compromised, the Shakti Network can freeze the funds and assist the appropriate authorities in determining the rightful owner of the wallet.

The fee remitted for certification is used to support the operational overhead of tracing the funds and supporting the constituents with their inquiries and also promptly crediting the wallet holder in the event of a security breach to refund the lost funds.



5. MANAGEMENT

5.1. Customization

The wallet has a transaction folder from which day-to-day transactions are made. Beyond that, the Wallet or Vault holder can segment their SXE wallet into as many custom folders as they like. For instance, a user may wish to create a folder for a special savings goal like “Kids College” or “New Bike.” The idea is to keep the wallet structure simple and easy for each user to customize to their own needs.

5.2. Transaction Folder

This folder has a cryptographic public wallet address. It facilitates the flow of funds in and out of the SXE Member’s account. Funds that flow out of the transaction folder and are not accepted and credited by the recipient within the 48-hour cut-off period are re-deposited back into the sender’s transaction folder. This is the default setting but the wallet holder can define their own parameters.

The transaction folder functions as a holding account for an outbound transfer. Inbound SXE funds are credited immediately into the transaction folder.

Bonus Bounties are promised and allocated to all new SXE Wallets and Vaults to encourage wider membership participation within the SXE Network and to get others to join. Bounties will be highest at the outset of the program and will be steadily reduced to 108 SXE Coins over time as the SXE Network achieves certain growth objectives.

The amount endowed as a Bonus Bounty is released to the wallet holder after seven years (84 months) provided the wallet holder has executed at least one transaction a month for the first seven years. Thus, Proof-of-Effort by wallet holders is ensured to stimulate the economy from the bottom-up and it contributes to the thriving Shakti Coin ecosystem. This bounty can be activated sooner by referring family and friends to the SXE Network. We have made it easy for SXE Wallet or Vault holders to invite others. If a referral joins, then one month is taken off the referrer's Bounty waiting period.

5.3. Certified Account

Certified denominations are issued to support the liquidity of the Shakti Network and to invite mainstream adoption and participation into this emerging medium of exchange without worrying about the intricacies and challenges of the cryptocurrency market, such as forgetting the password, to access their store of value.

The denominations herein identified as Certified SXE funds vary from one thousand (1,000) SXE to one hundred thousand (100,000) SXE. The Certified SXE funds have unique built-in features, such as electronic watermark identifier code to track, trace, and locate the bona fide holder of the funds and to validate the present holder of the certified denomination in the event of:

- Fraud
- Theft
- Hack
- Loss of wallet
- And/or any other potential loss or breach that may have transpired, even by a bona fide wallet holder.

If a wallet holder initiates a police claim which is certified by independent validators, then the SXE Network begins to trace the funds to assist the appropriate authorities in determining the rightful owner.

5.4. Peer-to-Peer Short-Term Smart Loans

SXE Network wallet holders can advance liquidity to other SXE Network wallet holders using the Wallet-to-Wallet (W-2-W) smart function. This facilitates small and micro-loans.

The W-2-W function has a built-in smart contract to return SXE funds advanced to the liquidity provider. The short-term credit will not exceed 60-days. The SXE liquidity provider may charge the recipient a fee of up to five percent (5%) maximum of the funds advanced.

In the event that a peer-to-peer liquidity provider fails to recover the short-term advancement, then the default provision of the liquidity provider's smart contract will facilitate the recovery from the default wallet holder.

5.5. Peer-to-Peer, Secured Smart Micro-Loans

The Shakti Network allows wallet holders to enter into secured loans on a peer-to-peer basis, (i.e., Wallet-to-Wallet). Shakti smart contracts are negotiated by the wallet holders. The secured credit is codified in a “smart contract” on the blockchain which ensures that the creditor automatically recovers the funds from the borrower’s wallet until the creditor is fully reimbursed.

The W-2-W codified arrangement is negotiated peer-to-peer and agreed in advance with default provisions, which include any potential extensions agreed by the wallet holders, independently. Upon acceptance, it is entered in the Shakti blockchain ledger as an immutable record.

SXE liquidity can be managed on a peer-to-peer basis with built-in smart contracts. The wallet function is the underlying program that keeps all parties obligations bound contractually. The fees are due and payable at the end of the term of the contract. The maximum term allow to the SXE liquidity provider is five (5) years and the fees charged may vary region-to-region and subject to their applicable laws.

The liquidity provider can always waive or reduce the fees, but at no point in time can the wallet holder charge fees higher than what the applicable laws permits them to be charged.

This feature may later be integrated with other public blockchains to function more efficiently.

5.6. Additional Rules for Parents Using Consumer SXE Wallets

A parent who has a child participating in the Shakti Coin program must register that child in the SXE Network. The child will then have an SXE Wallet that the parent controls until the child reaches 16 years of age. Participating parents are assigned an SXE wallet with a corresponding cryptographic public address linked to their children. The transaction folder, as described above, is linked to the children’s wallet ID. Shakti Network will also provide an option for wallet holders to assign a vanity address for ease of usage and reference.

The children’s wallet IDs are linked to the designated parent or legal guardian’s wallet ID. It is instructive to note that all SXE coins are credited to the parent or guardian’s wallet and confirmation is issued to the child. It’s important to note that each individual in the SXE Network can have only one wallet assigned to them — even if they exert control over multiple other wallets. So, although a parent may have control of one or more of their children’s wallets, the parent will still only have one SXE Wallet registered in their name.

5.7. SXE Vault

SXE Vault includes all SXE Wallet capabilities and smart-contract features outlined above. It also includes higher transfer thresholds. Merchants can customize their wallets with folders, use the smart loan functions, and have control over their children's wallets just like the SXE Wallet holder.



6. VALUE & EXCHANGE

6.1. Value of SXE: Equivalent of Fiat Money

One Shakti Coin has a US \$5.00 pegged value. The value is aided by the SXE Network certified currency holders, who are supporting the prescribed value, and the Shakti ledger, that will not reach consensus unless the value exchanged is within the prescribed threshold values for each wallet holder.

Any person can purchase Shakti Coins at any time from approved exchanges that have joined the SXE Network. There may be restrictions to acquiring Shakti Coin directly from the SXE Network in certain regions or countries, such as in the United States of America where restrictions vary from state to state.

6.2. Managing Value

Shakti Coin has fixed value and it is pegged to USD at a value of 1 SXE = US \$5.00. The Shakti Wallet-to-Wallet transfer function will facilitate liquidity from any SXE holder to another at the rate of US \$5.00 for each coin they hold.

Shakti Network participants are incentivized to support wallet holders with a fixed value. Very specifically, the merchant (vault) wallet holders are incentivized to exchange goods and services at the rate of US \$5.00 per Shakti Coin. If SXE holders try to exchange the coins and the merchant fails to provide value at that rate of 1 SXE to US \$5.00, then the blockchain will not reach consensus and the transaction will not go through. Thus, Shakti Coins will maintain a stable value of 1 SXE to US \$5.00 at a peer-to-peer level all the time.

In addition, each wallet has a built-in rating function that allows the wallet holder to rate the merchant. This will allow users to flag merchants who attempt to charge a higher price for purchases made with Shakti Coin.



7. TRANSACTION FEES

7.1. Micro-Transaction and its Cost

Shakti defines payments of up to and including two Shakti coins (SXE = 2, USD = 10) as a micro-transaction.

For a micro-transaction the processing fee is fixed and is set at 500 Toshi (USD = 0.025, SXE = .005).



8. MINING

8.1. Mining Fees

Within the SXE Network, miners are compensated with a transaction processing cost as their mining fee. The fee is shared among the miners to provide consensus within the Shakti Network as defined below:

- The minimum mining fee is set at 500 Toshi (SXE = 0.005, USD = 0.025). The transaction processing cost, Y , is calculated using the following equation.

$$Y = 0.005 \text{ SXE, when } \text{SXE} \leq 2,$$

- For a transaction amount of more than 2 SXE, the transaction processing cost, Y , is calculated using the following equation.

$$Y = k * \text{Log}_2(\text{SXE}), \text{ when } \text{SXE} > 2$$

- All values are measured in SXE.
 - The function is continuous. The coefficient, k , regulates the growth rate.
 - Y is the value of processing payment cost.
- The miner who initiates a transaction to be included within the block earns five percent (5%) of the transaction processing fees when there is a consensus.
 - Eighty-Five percent (85%) of the allocated transaction processing fee is paid to miners, as the first authority, to validate the transaction on the SXE Network.
 - The remaining 10% of the transaction processing fee is paid to the SXE Network to enforce SNMP Policy and to continue to improve the PoE Protocol.

- Miners are compensated at the rate of 5 Toshi (USD = 0.00025, SXE = 0.00005) per consensus until the 85% is used up.
- When the exchange of value takes place, the seller and the buyer pay the transaction processing fees.
- When credit is advanced, only the beneficiary pays the transaction cost.
- When a service is rendered, both parties pay the transaction cost.

You can read more about mining Shakti Coin in Part II of this white paper.

Part II

Mining Shakti Coin

April 5, 2019



ShaktiCoin



9. A NEW APPROACH TO MINING

9.1. Mining PoE Protocol

The Proof-Of-Effort (PoE) protocol rewards parents who support their children's education through the daily routine of school attendance.

While the node operator plays a central role, mining a Shakti Coin is a communal effort. In addition to the conventional miner (node operator), mining requires the participation of children, parents, and the community to ensure attendance and validate it.

Miners record the efforts of children who pursue an education. Miners record and verify each child's effort in attending a school and also record the granting of a Shakti Coin once the effort is verified.

For every child, each day is a new day. Each day, a new coin is mined and granted to the parent for supporting their child's education by attending school. Coins are granted each day the child attends school through the age of twenty-one (21).

9.2. Mining in Satoshi's Bitcoin World

The verb "to mine" used to mean "to dig in the ground for minerals." Satoshi changed that. In the cryptocurrency world mining took on a new definition:

"Obtain units of [a cryptocurrency] by running a computer process to solve specific mathematical problems."

The Bitcoin network is an open public network. That means anyone with an internet connection can participate in that network to mine and transact coins without revealing their real identity.

Sadly, the world is full of dishonest people. Satoshi tries to keep the network honest by compelling participants to go through a complex process of solving a mathematical puzzle, every 10-minutes before they are classified as honest participants to record transactions on the ledger.

This, in a nutshell, is known as mining, which prevents Sybil, DDOS, and other kinds of attacks. In other words, Bitcoin "miners" are just running computer programs that automate the process of securing the network.

9.3. Mining in Shakti World

The SXE Network is a closed public network. That means anyone can participate but they must first join the network by proving their identity. No anonymous players are allowed on the SXE Network. This applies to all SXE Wallet holders and SXE Vault holders as well as miners. This is one of the ways the SXE Network is protected from dishonest people and illegal activity.

Miners in the Shakti world do the following:

- Process transactions from the SXE network;
- Validate new transactions and ensure that there are no conflicts with existing ones;
- Organize transactions into a sequence of blocks and assign cryptographic hashes;
- Submit the blocks to the blockchain network;
- Verify schoolchildren's efforts towards education, i.e. recording their attendance at school;
- Verify the existence of the schools;
- Confirm the identity of the children who are on board;
- On-board liquidity providers;
- Provide computing resources within the SXE Network;
- Support other educational service providers;
- Earn transaction fees for validating and reaching a consensus.



10. THE DEMOCRATIZATION OF MINING

10.1. We Welcome All

The SXE Network, as mentioned before, is a public network which is decentralized, well-distributed, and available to all. It is a collaboration between various stakeholders, namely parents, children, verifiers, and miners.

It also includes:

- Merchants
- Miners
- And anyone who wishes to use or hold Shakti as a store of value.

Any person can join the SXE Network by self-on-boarding and obtaining an SXE Network ID.

Once an individual obtains their unique SXE Network ID, they are given a wallet and can participate any way they like. This includes earning SXE Coins within the network by mining, validating, on-boarding others, or providing peer-to-peer loans.

There is no restriction on who can join, leave, or re-join the SXE Network. However, the system requires registration in compliance with “know your customer” (KYC) best practices.

Only SXE Network ID holders can mine Shakti Coins and make a contribution to the network. Miners are compensated with fixed transaction fees when the participating SXE Network nodes reach consensus and validation is completed by a computer that is connected to the SXE Network.

10.2. Who Can Mine?

Anyone can mine Shakti Coins provided they have joined the SXE Network and validated their identity.

Miners mine Shakti Coins in two ways:

1. By on-boarding SXE Network participants who require assistance or may not be able to onboard themselves.
2. By providing computing power to compute hash blocks.

There is no qualification or credential required to join the SXE Network. The only requirement is that one must obtain a valid SXE Network ID by authenticating one's identity.

One has to be part of the SXE Network to be permitted to contribute and earn SXE coins. One can mine SXE coins by on-boarding:

- IT Professionals who provide computing power on the SXE Network, i.e., node providers.
- Independent Validators
- And any other potential contributors to SXE Network, as it evolves.

When miners on-board participants they earn micro-payments on a daily basis for three years. After that, miners are required to re-board to renew their participation again. The more people they bring to the SXE Network, the more micro-payments they earn.

10.3. Mining PoE Service Providers

Any person can offer education-related services to children, provided that they are part of the SXE Network and that the services are accepted by parents/guardians, and an independent validator who authenticates that the service provider is capable of providing such a service.

Upon validation, the PoE protocol will begin to compensate the service providers with micro-payments whenever they contribute to the children's education and the act is verified. Miners validate (mine) on each separate occasion as service is provided.

We have identified the categories of providers as follows:

1. Transportation Providers
2. Certified Music Teachers
3. Certified Physical Training Providers & Coaches
4. NGOs who are registered to provide services to youth
5. Social Workers
6. Community Support Groups
7. Behavioral Health & Wellness Professionals/Counselors
8. Child Abuse & Neglect Professionals
9. Youth Coordinators
10. Private Tutors
11. Miscellaneous

Service providers are compensated with SXE micro-payments on a daily basis for any validated service that furthers children's education.



11. BUILDING ON TRUST

11.1. Earning Super Node Credentials

Any individual with a mining license — i.e., a software license that will grant them a SXE Network ID is permitted to operate a Node. The class of Node an individual is permitted to operate depends upon their own contribution to the PoE protocol.

Node Categories:

1. Leaf Node — a mobile device with internet access.
2. Child Node — a computer with internet access.
3. Parent Node — Shakti server at home.
4. Sub Node — Shakti Mining Software Application validating SXE transactions on the Network.
5. Secondary Node — Shakti Mining Software Application validating SXE transactions on the Network — T1 Data Center recommended.
6. Primary Node — Shakti Mining Software Application validating SXE transactions on the Network — T2 Data Center recommended.
7. Master Node — Shakti Mining Software Application validating SXE transactions on the Network — T3 Data Center recommended.
8. Super Node — Shakti Mining Software Application validating SXE transactions on the Network — T4 Data Center recommended.

Any SXE Network ID holder can operate a Leaf, Child, or Parent Node. Once they obtain the SXE Network ID, they can immediately start mining Shakti Coins and also earn the credentials required to become a Super Node operator.

11.2. Graduated Node Credentials

Miners earn node credentials to become a Super Node operator by on-boarding participants.

Miners start mining from Leaf Node (i.e., using a mobile device) and can eventually earn sufficient credentials to become a Super Node operator. The Super Node operator requirements vary from region to region, given security requirements and other regional factors.

The PoE protocol is subject to ongoing review by The Shakti Foundation, the governing body of the SXE Network, which is domiciled in Zug, Switzerland. The Shakti Foundation provides oversight to the entire Shakti Coin Project to ensure it abides by the founder's intended vision, mission, and goals defined for Shakti Coin.

11.3. Earning Trust and Mining Credentials

SXE Network ID holders can become trusted parties to validate participants.

As a member provides mining services to the SXE Network, that member gains trust and earns credentials to become an enhanced trusted party. If enough trust is earned then that member will receive credentials to operate a Super Node on the SXE Network. In addition, that miner can also earn the credentials to be an independent validator.

Independent SXE Network validators hold a unique credential within the Shakti ecosystem by virtue of identifying, authenticating, and attesting human presence. They are the eyes and ears of the SXE Network. They are trusted participants who uphold and protect the ecosystem for all SXE Network participants. They hold one (or more) of the following credentials that enable them to:

- On-board SXE Network members
- Validate children's active participation
- Validate services delivered to the children
- Validate transactions
- Cross-verify the identity of participants who have on-boarded themselves to obtain legitimate mining credentials

Independent Validator Credentials are earned through an on-going graded process leading to eligibility to become a full-fledged Node Operator. This process is explained in Part III of this document.

It is a privilege to be an Independent Trusted Validator. Any abuse of this position can result in the loss of all SXE Network privileges.



12. MINING FOR SOCIAL GOOD

12.1. Mine Locally

The PoE Protocol incentivizes miners to spring up within grassroots communities organically. The Shakti ecosystem is optimized at the code level to reach consensus with the adjacent nodes, which means that algorithmically, regional consensus givers are given priority.

12.2. Responsible Mining

The PoE Protocol was designed to address what we perceive as the limitations of traditional cryptocurrency mining with regard to high barrier to entry, high energy consumption, and monopolization of mining.

SXE coins are mined using the PoE protocol which works within a network of trusted operators. Therefore, one does not require powerful computers to mine Shakti Coins, wasting precious electrical energy as in the well-publicized case of Bitcoin. For example, the energy required to operate a Node on the SXE Network is roughly equivalent to that required to operate a mail server.

In this way, the PoE Protocol allows for democratized mining. Individuals can participate and be compensated at all levels of technical capability. For instance, someone with a smartphone can mine Shakti Coins simply by on-boarding new SXE Network members. An average PC or laptop can be used for more complex computations. Alternatively, a high-end server hosted at a data center can be used to provide computing power to reach block consensus. There is a place for everyone.

The PoE Protocol also localizes mining to keep the benefits of transactions in the community where they originate. Validated transactions are optimized within adjacent nodes to benefit the local communities, which reaches a consensus within adjacent nodes. This feature ensures that earned Shakti Coins are kept within the local community to foster the creation of an organic SXE market for using Shakti Coins at the grassroots level. It prevents any highly-resourced miner or group of miners from dominating mining on a global basis at the expense of less technologically equipped local communities.

With this unique protocol and the SXE Network's smart Wallet-to-Wallet (W-2-W) function, the Shakti ecosystem fosters a more progressive view of how a blockchain-based currency can benefit its users. Not least among these beneficiaries are the poor and unbanked whose financial and educational inclusion would benefit us all.

12.3. Miners Conduct

Miners are the heart and soul of the SXE Network. In many respects, this is a network built by the mining community. It is our intent that all miners benefit from their participation in the network. In return, we expect that all miners share our belief that every child deserves to attend school and that parents who enable school attendance are providing a benefit not only to their child but to their community and society as a whole. Beyond that, we have developed a set of five fundamental responsibilities that we feel define the highest level of contribution for a SXE Network miner. We hope they will be embraced as a guideline for miners who wish to maximize their contribution to the SXE Network.

1. Actively deter fraud. Miners will do their best to ensure that Shakti Coins are mined by real participants, not fake students, and distribution is only earned based on a child's actual attendance.
2. Serve as an SXE Network advocate. Blockchain-based currency is new and intimidating to most people. Proactively speak with those in your community to foster understanding and acceptance of Shakti Coin as a credible store of value and day-to-day means of exchange.
3. Promote school attendance locally. Miners should work with their communities to overcome the local challenges and obstacles that inhibit school attendance.
4. Provide outreach. Shakti miners should actively and consciously seek out parents who could benefit from the program. This is particularly true of parents who are unaware of the Shakti Project or who are simply not comfortable enough with technology and may thereby be reluctant to join.

5. Uphold the vision. The Shakti Project was started to create a means of exchange that is more equitable and useful to all people. By providing this tool to humanity, we believe the SXE Network will be a positive force for global peace and prosperity. We thereby would expect our miners to uphold this vision and never, either directly or indirectly, participate in or encourage any scheme to undermine it.

12.4. Banking the Unbanked

According to the World Bank, there are 1.7 billion people globally who are “unbanked.” That’s a number of people equal to five times the population of the United States. Imagine the positive impact of having the equivalent of five more US populations participating in the global economy (as well as supporting the education of their young).

Being unbanked means lacking access to the financial tools most of us take for granted, such as a means for obtaining credit, investing, or even opening a checking account. Since they are “off the financial grid” the unbanked are also invisible to many of the very services set up to assist them financially. This, in addition to a lack of education, contributes to the cycle of poverty that can persist for generations.

The Shakti Project presents an opportunity to break this cycle. It provides a unique opportunity to help those who are making an effort to help themselves. The SXE Network offers powerful incentives to engage the unbanked such as low barriers to entry, Genesis Bounties to early adopters, daily stipends for school attendance, and easy access to smart transfer and lending functions. Add to this a global team of miners dedicated to helping onboard the uninitiated and we have the real potential to create a world with less poverty and ignorance and more financial autonomy and independence.

12.5. SXE Network Monetary Protocol

The SXE Network Monetary Protocol are the rules, adopted into code, that govern the day-to-day operations and transactions on the SXE Network. They have been designed for the benefit of all SXE Network members.

A significant part of the protocol is dedicated to upholding the value of Shakti Coin at its fixed value of US \$5.00. It is imperative that the coin maintains its value in relation to the US dollar, particularly in the early days as the coin is developing its user base. In addition to the protocols, we will also rely on our miners to help at a community level to support Wallet-to-Wallet value exchange.

Miners are on the front lines and therefore can help their community by serving as Shakti Coin ambassadors helping, for example, to explain the concept to new users or encourage local parents and merchants to join. In addition, any miner who has an idea of how to improve the Shakti Coin Monetary Protocol is encouraged to engage with other Shakti constituents, to change the Monetary Protocol by proposing suitable protocol amendments by the members of the the SXE Network.

12.6. Mining PoE Merchants

Shop owners are encouraged to build Node presence (i.e., maintain a computer on the SXE Network) not only to support the SXE Network but also to earn additional mining fees. This will further incentivize merchants to join, adding confidence to the ecosystem as a whole.

12.7. Mining Independent PoE Validators

Miners should network within their local community to on-board civic leaders, fair-minded individuals, social influencers, activists, and elders. Encouraging these people to join give the SXE Network eyes and ears on the ground to better serve the community. Over time, some of these people may wish to become Independent Validators in the SXE Network playing a vital and trusted role.

Civic leaders and those providing critical services, particularly related to education, are in a position to contribute most directly to the proper adoption of the SXE Network in the local community. These individuals could include:

- Primary/Secondary/High School Teachers & Administration Staff
- College Faculty & Administration Staff
- University Faculty & Administration Staff
- Accredited/Registered Private Educational Institutions
- Private Tutors
- Qualified Professionals, Engineers, Information Technology Professionals
- Lawyers/Accountants/Doctors
- Members of Any Other Qualified Professionals
- Owners of Data Centers/ISPs/STD ISD Telephone Booth Operators
- Directors of Private/Public Corporations
- Members of the Judicial Corps
- Members of the Unionized Workforce
- Members of the Civil Servant Corps
- Democratically Elected Members of Local/Provincial/Federal Governments
- Member of Law Enforcement/Military corps
- Member of Public Health Service Corps
- Member of Local/International Non-Governmental Organizations
- Member of Emergency Service Corps
- Member of Faith Groups
- Member of Public Library Corps
- Member of Professional Bodies



- Member of Diplomatic Corps
- Registered Transportation Providers

12.8. Mine Locally, Trade Globally

The SXE Network was developed with two types of native wallets:

- SXE Wallet
- SXE Vault

Both of these wallets are tightly integrated with the SXE Network Monetary Protocol (SNMP) Policy under built-in smart contracts. The main difference between the two types of wallets is that the SXE Vault has additional functional features that are more suitable for miners and merchants.

All wallets allow for secure, near frictionless, smart, Wallet-to-Wallet transactions, across the countertop or around the world. The SXE Vault is a merchant wallet designed to support both merchants and miners globally.

The Shakti Network is built from the bottom-up — village by village, community by community. The Network offers a trusted environment for grassroots miners to introduce a new smart currency option to their community, thus creating opportunity and fueling greater prosperity for all.

12.9. Earning Shakti Coins

Miners with SXE Network IDs earn fees for validating transactions by lending their computing power (mining) to the Shakti Network. For that service, they are compensated with fixed transaction processing fees.

- Transaction processing fees are earned by the initiating miner and the first set of confirming miners. Fees are paid in Toshi, a micro-denomination of SXE Coin.
- The first miner who initiates the consensus earns 5% of the transaction fee and the set of first miners who confirm the consensus earns the remainder of the fees at the rate of 5 Toshi (0.00005 SXE or US 0.025¢) per consensus until the sum of fees earned reaches 90% of the total.
- The final 10% of total fees is paid to the Shakti Network to enforce Global Compliance and SNMP Policy and continue to further propagate the SXE monetary policy and to promote Shakti Coin adoption globally.
- Any payment up to and including two (2) Shakti Coins is considered a micro-transaction. The cost of a micro-transaction is fixed and it is set at 500 Toshi (= US 2.5¢).

- The processing payment cost (Y) is calculated as $Y = \text{SXE } 0.005$ when transaction size is $\text{SXE} \leq 2$; and $Y = k \cdot \text{Log}_2(\text{SXE})$ when $\text{SXE} > 2$.
- 1 Chai (=US 5¢) is the minimum amount that any node can transact over the Shakti Network.

Note:

- All values are measured in SXE.
- The function is continuous. The coefficient, k, regulates the growth rate.
- Y is the value of processing payment cost.

12.10. Miners Potential Earnings

Although the SXE Network can scale transactions of more than 10,000 per second, the calculation shown below is for a network that is operating at 20% of its capacity.

When the SXE network is up and running, Shakti Miners have the potential to earn approximately SXE 171 Coins (US \$855) per day based on the key assumptions outlined below:

Assumptions:

1. The first miner to provide consensus earns the set transaction fee. Minimum fee earned for each consensus is 5 Toshi (= US 0.025¢). Transaction costs are shared equally among the first consenting nodes.
2. Computer nodes are available during the entire 24-hour period to accept network throughput.
3. Only micro-transaction fees are taken into consideration which, for this assumption, is defined as any payment up to and including 2 SXE.
4. Only 5% of the mass population participates in the Shakti ecosystem.
5. Average person transacts three times a day.
6. Potential Daily Earning: \approx approximately SXE 171 Coins (US \$855) per day
7. SXE ledger reaches consensus every second, which means 3,600 Blocks closed per hour.