Echoin

WHITE PAPER

Create a Public Chain Ecology

Oriented to Energy Economy

TOKEN
EC

Risk Factor and Disclaimer Statement

Please read this Risk Factor and Disclaimer Statement (the "Statement") carefully before proceeding to read this Whitepaper document issued by the Echo Lab Foundation Ltd (the "Foundation") on ECHOIN, a distributed network. This Statement applies to all persons who read this document and who may purchase, use, sell and/or hold the Echoin Token (the "EC") and EUSD. Please note this Statement may be altered or updated.

IMPORTANT NOTE: AS NOTED ELSEWHERE IN THESE TERMS, NEITHER EC NOR EUSD IS BEING STRUCTURED OR SOLD AS SECURITIES OR ANY OTHER FORM OF INVESTMENT PRODUCT. ACCORDINGLY, NONE OF THE INFORMATION PRESENTED IN THIS STATEMENT IS INTENDED TO FORM THE BASIS FOR ANY INVESTMENT DECISIONS, AND NO SPECIFIC RECOMMENDATIONS ARE MADE OR INTENDED. THE FOUNDATION EXPRESSLY DISCLAIMS ANY AND ALL RESPONSIBILITY FOR ANY DIRECT OR CONSEQUENTIAL LOSS OR DAMAGE OF ANY KIND WHATSOEVER ARISING DIRECTLY OR INDIRECTLY FROM: (I) RELIANCE ON ANY INFORMATION CONTAINED IN THIS STATEMENT; (II) ANY ERROR, OMISSION OR INACCURACY IN ANY SUCH INFORMATION; (III) ANY ACTION RESULTING FROM SUCH INFORMATION OR (IV) THE SALE OR USE OF EC or EUSD.

PLEASE NOTE THAT U.S. PERSONS MAY NOT PARTICIPATE IN THE SALE OF EC OR EUSD. IF YOU ARE A NON-U.S. PURCHASER, YOU MAY ONLY PARTICIPATE IF YOU ARE OUTSIDE OF THE UNITED STATES AT THE TIME OF THE PURCHASE.

By purchasing, holding and using EC or EUSD, you expressly acknowledge that you understand and assume the following risks:

1. Risks Associated with the related Blockchain
   Because EC, EUSD and the Echoin Blockchain are based on blockchain technology, any malfunction, breakdown or abandonment of the relevant blockchain may have a material adverse effect on the Echoin Blockchain or EC or EUSD. Moreover, advances in cryptography, or technical advances such as the development of quantum computing could present risks to EC, EUSD and the Echoin Blockchain by rendering ineffective the cryptographic consensus mechanism that underpins the relevant blockchain.

2. Risk of Losing Access to EC or EUSD Due to Loss of Private Key(s)
   A private key, or a combination of private keys, is necessary to control and dispose of EC and EUSD stored in your digital wallet, vault or other storage mechanisms. Accordingly, loss of requisite private

key(s) associated with your digital wallet, vault or other storage mechanisms storing EC or EUSD may result in loss of such EC or EUSD. Moreover, any third party that gains access to such private key(s), including by gaining access to login credentials of a hosts wallet service, may be able to misappropriate user's EC or EUSD. We cannot be responsible for any such losses.

3. Risk of Hacking and Security Weaknesses
   Hackers or other malicious groups or organizations may attempt to interfere with the Echoin Blockchain, EC, or EUSD in a variety of ways, including, but not limited to, malware attacks, denial of service attacks, consensus-based attacks, Sybil attacks, smurfing and spoofing. Furthermore, initially EC and EUSD will be "ERC-20" tokens on Ethereum, and Ethereum rests on an open-source software and is an unpermissioned distributed ledger. There is a risk that third party or Foundation members may intentionally or unintentionally introduce weaknesses into the core infrastructure of the Echoin Blockchain, which could negatively affect the Echoin Blockchain, EC and EUSD.

4. Risk of Uninsured Losses
   Unlike bank accounts or accounts at other financial institutions, neither EC nor EUSD is insured, unless specifically obtained from private insurance institutions. Thus, in the event of loss or loss of utility value, we do not offer public or private insurance services providing recourse (we are not obliged to compensate or insure in the event of loss or loss of utility value).

5. Risks Associated with Uncertain Regulations and Enforcement Actions
   The regulatory status of EC, EUSD and the distributed ledger technology is unclear or unsettled in many jurisdictions. It is difficult to predict how or whether regulatory agencies may apply existing regulation with respect to such technology and its applications, including the Echoin Blockchain, EC and EUSD. It is likewise difficult to predict how or whether legislatures or regulatory agencies may implement changes to law and regulation affecting distributed ledger technology and its applications, including the Echoin Blockchain, EC and EUSD. Regulatory actions could negatively impact the Echoin Blockchain, EC and EUSD in various ways, including, for purposes of illustration only, through a determination that EC or EUSD is a regulated financial instrument that requires registration or licensing.

6. Risks Associated with Regulations on Energy Market
   Additionally, the future development of the energy market is uncertain. The laws and regulations in a jurisdiction are subject to change. Changes will impact the regulatory status of the energy market.

   The Foundation may, therefore, cease operations in jurisdictions in the event that regulatory actions, or changes to laws or regulations, make it illegal to operate in such jurisdictions, or make the ability to obtain the necessary regulatory approval(s) to operate in such jurisdictions commercially undesirable.

7. Risks Arising from Taxation
   The tax characterization of EC and EUSD is uncertain. You are advised to consult CPAs for advisement before the purchasing, holding and utilization of EC or EUSD, which may result in adverse tax

consequences, including, but not limited to, withholding taxes, transfer taxes, value added taxes, income taxes, levies, duties or other charges and tax reporting requirements.

8. Risk of Alternative Networks / Competitors
   It is possible that alternative networks could be established in an attempt to facilitate services that are similar to our services, or alternative networks could be established that utilize the same or similar code and protocol underlying EC, EUSD, and the Echoin Blockchain. The Echoin Blockchain may compete with these alternative networks, which could negatively impact the Echoin Blockchain, EC and EUSD.

9. Risks Associated with the Development and Maintenance of the Echoin Blockchain
   The Echoin Blockchain is still under development and may undergo significant changes over time. Although it is intended for EC, EUSD and the Echoin Blockchain to follow the specifications set forth in the Whitepaper, and the Foundation will endeavor to work towards those ends (subject to internal business considerations), changes may be required to meet the specifications of EC, EUSD or the Echoin Blockchain. This may result in EC, EUSD or the Echoin Blockchain, as further developed and maintained, not meeting the expectations that users had at the time of purchase. Furthermore, despite our good faith efforts to develop and maintain the Echoin Blockchain, it is possible that the Echoin Blockchain will experience malfunctions or otherwise fail to be adequately developed or maintained, which may negatively impact the Echoin Blockchain, EC and EUSD.

10. Risk of Unfavorable Fluctuations in Currency Value
    The Foundation intends to use the proceeds from selling EC to fund the maintenance and development of the Echoin Blockchain. The proceeds of the sale of EC will be mainly denominated in ETH and possibly other digital assets and may be converted into other cryptographic and fiat currencies. If the value of digital assets fluctuates unfavorably during or after the contributions, the Foundation may be unable to fund development or may be unable to maintain the Echoin Blockchain in the manner initially intended.

11. Risk of Dissolution of the Foundation
    Although the Foundation will endeavor to work toward the ends set out in the Whitepaper, it is possible that, due to any number of reasons, including, but not limited to, changes of laws and regulations, unfavorable fluctuations in the value of cryptographic and fiat currencies, significant changes of commercial relationships, or intellectual property ownership challenges, Echoin Blockchain operation may no longer be viable and the Foundation may be dissolved.

12. Risks Arising from Lack of Governance Rights
    All decisions involving the Echoin Blockchain or the Foundation may be made by the Foundation at its sole and absolute discretion, including, but not limited to, decisions to discontinue the Echoin Blockchain, to create and sell more EC or EUSD for use in the Echoin Blockchain, or to sell or liquidate the Foundation. These decisions could adversely affect the Echoin Blockchain and EC.

13. Risks Involved in Cloud Storage

As the Echoin Blockchain may provide a decentralized cloud storage service to individual and institutional clients, including users and applications, the services are susceptible to a number of risks related to the storage of data in the cloud. The services may involve the storage of large amounts of sensitive and/or proprietary information, which may be compromised in the event of a cyberattack or other malicious activity.

Similarly, in the event of an attack or malicious activity, services may be interrupted and files may become temporarily unavailable. Because users can use a variety of hardware and software to interface with the Echoin Blockchain, there is the risk that services may be interrupted due to an interoperability failure or the inability to integrate these third-party systems and devices that the Group Entities (Group Entities means the Foundation and its affiliates) do not control. The risk that the services may face increasing interruptions and the Echoin Blockchain may face additional security vulnerabilities may adversely affect the Echoin Blockchain and the future utility of any EC you hold.

14. Risks Associated with Markets for EC and EUSD

There is no prior market for EC or EUSD, and the EC token distribution may not result in an active or liquid market for EC. EC is designed to be used solely within the Echoin Blockchain, hence there may be illiquidity risks. Neither EC nor EUSD is a currency issued by a central bank, national, supra-national or quasi-national organization. Neither EC or EUSD is a "commodity" in the traditional sense of that word, and EC is not backed by any hard assets or external credit systems. We are not responsible for, nor do we pursue, the circulation and trading of EC on any market. The trading value of EC depends solely on the consensus between relevant market participants. No one is obliged to purchase EC from any holder of EC, nor does anyone guarantee the liquidity or market price of EC, to any extent, at any time. Furthermore, EC and EUSD may not be resold to a purchaser who is a citizen, national, resident (tax or otherwise), domiciliary or green card holder of a Restricted Country (which includes but is not limited to the United States of America, and the People's Republic of China) or to purchasers where the purchase of EC and EUSD may be in violation of applicable laws. Accordingly, we cannot ensure that there will be any demand or market for EC, or that the price you pay for EC is indicative of any market valuation or market price for EC.

Even if secondary trading of EC is facilitated by third party exchanges, such exchanges may be relatively new and subject to little or no regulatory oversight, making them more susceptible to fraud or manipulation. Furthermore, to the extent that third parties ascribe an external exchange value to EC (e.g., as denominated in a digital or fiat currency), such values may be extremely volatile, declining below the purchase price you have paid for.

15. Loss of Talent

The development of the Echoin Blockchain depends on the continued co-operation of the existing technical team and expert consultants, who are highly knowledgeable and experienced in their respective sectors. The loss of any member may adversely affect the Echoin Blockchain's future development.

16. **Uncertainties Associated with the Development of the Echoin Blockchain**
    The Echoin Blockchain is still in the developmental stage, hence there may be large changes to the final design before the official version is released. There is a risk that the development of the ECHOIN ecosystem might not be executed or implemented as planned. The ECHOIN ecosystem may not meet the expectations of EC or EUSD purchasers for a variety of reasons, including, but not limited to, the event of a decline in the prices of any digital asset, virtual currency, EC or EUSD, unforeseen technical difficulties, and a shortage of development funds for activities.

17. **Competition and Anti-Money Laundering**
    The purchase or holding of EC or EUSD may be subject to competition, anti-money laundering, counter-terrorism financing or other regulatory requirements in certain jurisdictions. You shall refrain from purchasing any EC or EUSD until professional advice is sought and all queries are answered to your satisfaction.

18. **Unanticipated Risks**
    Cryptographic tokens such as EC and EUSD are a new and untested technology. In addition to the aforementioned risks, there may be other risks associated with the purchase, holding, and use of EC or EUSD, including risks that the Foundation has not anticipated. Such risks may materialize as unanticipated variations or combinations of the risks discussed in this statement.

Contents

Abstract

The purpose of this paper is to explain the design and technical implementation of the Echoin ecosystem. It is our goal to utilize blockchain technology to establish a new, decentralized energy trading market that will address current issues in the energy market. The current energy supply chain is long and complex, with egregious transaction costs. The efficiency of energy production and transportation is low, costs of energy payments and settlements are high, and energy transaction data is not fully utilized. The goals of the Echoin public chain are to reduce energy transaction costs, improve energy supply and demand structures, and improve energy data utilization.

In order to achieve these goals, Echoin public chain has proposed a series of blockchain-based solutions aimed at creating an industrial chain optimized for the energy industry. These technical solutions include:

1) Using a DPoS consensus governance mechanism;
2) Using trusted oracles to aggregate energy data, including energy IoT data;
3) Using Plasma sidechain technology to support high frequency trading in the microgrid market and ensure the privacy;
4) Optimizing the virtual machine to encrypt and decrypt identities and private data on the blockchain at low costs;
5) Issuing a stable currency for the settlement of the energy industry chain via trusted oracle machines and decentralized exchange technologies;
6) Developing efficient algorithms for virtual machines to support energy data analysis and data exchange within the energy market;
7) Developing cross-chain technologies to support automated trading between Echoin assets and other public-chain assets, thereby improving Echoin's integration with the peripheral energy industry.

Echoin has developed a strategic cooperation with world's largest online energy retailer www.czb365.com ("CZB 365" or "CZB"), and Echoin will provide services for more than 10,000 gas stations and 200,619 charging piles in the ecosystem of CZB 365. CZB 365 has established partnerships with China's TOP 100 commercial vehicle platforms. Currently, China's public charging piles integrated into the system of CZB 365 account for 75% of the total public charging piles, and CZB 365 covers 306 cities and 30 million commercial vehicle end users. Moreover, CZB 365 will be the first application in the Echoin ecosystem. These 30 million users will jump start the Echoin ecosystem.

The Echoin ecosystem will connect millions of Energy-IoT nodes with tens of millions of users, generating tens of billions of operational transactions. Meanwhile, Echoin plans to sign cooperation agreements with

numerous international energy trading companies. The future of Echoin will rely on the trillion dollar energy market.

Highlighting the Energy Industry's Status/Shortcomings

In this chapter, we will discuss the current state of the energy industry and its major shortcomings. The technical design of the Echoin public chain is built to address these shortcomings.

The complexity of the parties involved, long industrial chain and high settlement costs

While energy resources are still relatively abundant, global energy consumption is continuously rising, and there is growing pressure to reduce energy expenditures. Increasingly concentrated demand for energy resources has resulted in the diminishing marginal benefits of centralized power operations. As the centralized power ecology usership grows, efficiency falls, and operation costs increase.

1. **The current energy industry fails to properly address the diversity of end user needs.** End users include individuals, companies, shops etc. The methods and scenarios of energy trading vary regionally. As a result, energy contracts and prices are complex and additional costs are often incurred due to information asymmetry. Energy trading covers low-frequency, large-value trading and high-frequency, small-value trading. By the year 2017, there were 310 million motor vehicles in China, with an average re-fueling rate of 3-7 days. The number of gas station transactions was 42,860,000-103,000,000/day, i.e. low-frequency, large-value. However, in daily life, the frequency of electric energy and natural gas consumption is high, i.e. high-frequency, small-value. Electricity distributors rely on the general population to drive revenue/profit growth and promote further energy consumption; however, with the complicated pricing patterns and expensive transportation costs to different regions, the burden on the industry supply chain is exorbitant.

2. **The high capital cost of the long supply chain in the energy industry.** The energy industry's supply chain includes raw material extraction, energy production, transportation, sales terminals, consumers, and third-party service suppliers such as financial institutions. Natural gas and electric energy trading comprise the majority of the industry, and the supply chain involved in the settlement process is lengthy and complicated. The additional costs are transferred to end-consumers. In the oil industry, upstream in the supply chain are oil depots, refineries, and gas stations. Downstream, on the energy demand side, are the commercial fleet platforms and freight platforms. The platform for oil energy trading consists of four levels: the first-level refineries (oil depots), the second-level gas stations, the third-level energy trading platforms, and the fourth-level demand side, such as commercial vehicle platforms and freight car platforms. Between the first and the second level, the gas station needs to

purchase refined oil from the refinery, and prepay for future refined oil on a monthly or weekly basis. Between the second and the third level, the energy trading platform needs to provide a deposit to the gas station, to ensure that the downstream enterprises can directly offset the relevant expenses when refueling at the cooperative gas station. Between the third and the fourth level, commercial vehicle and freight car platforms need to provide an advanced payment to the energy trading platform to ensure that the gas station's purchase can be carried out without a hitch. Downstream enterprises send hundreds of millions of prepaid accounts to upstream enterprises annually, equating to roughly $100,000,000 in cash deposits. These funds are unable to be circulated in the accounts of upstream enterprises. This capital becomes the supply chain's driving force established by downstream enterprises. Energy delivery and transaction costs far exceed the cost of its production and supply links.

Diagram: Petrochemical energy industry chain

3. **The settlement cost is high.** During the settlement process, the information held by each settlement party is relatively closed, and mutual trust is low. As a result, large numbers of prepayments and billing periods are required at each level of the supply chain, leading to high transactions costs. On the B2B side, each time an energy company adds a trading partner, it must establish an independent reconciliation system and pay a large amount of accounting and personnel costs.

   The settlement payment to banks and third parties are extremely costly for energy companies. In China, the amount of transaction fees that a large gas station with daily revenues of 1 million yuan must pay may reach hundreds of thousands of yuan every year.

   According to statistics from the U.S. Department of Energy-Information Office, U.S. residents purchase an average of 382 million gallons of gasoline per day, 70% of which is paid for using credit cards. Credit card fees paid by gas stations account for roughly 2.5% of the transaction amount. Credit card fees have become the second-largest operating cost for gasoline retailers, exceeding storefront rent, resulting in an increase in gas prices by a few cents per gallon in the United States.

Low proportion of new energy

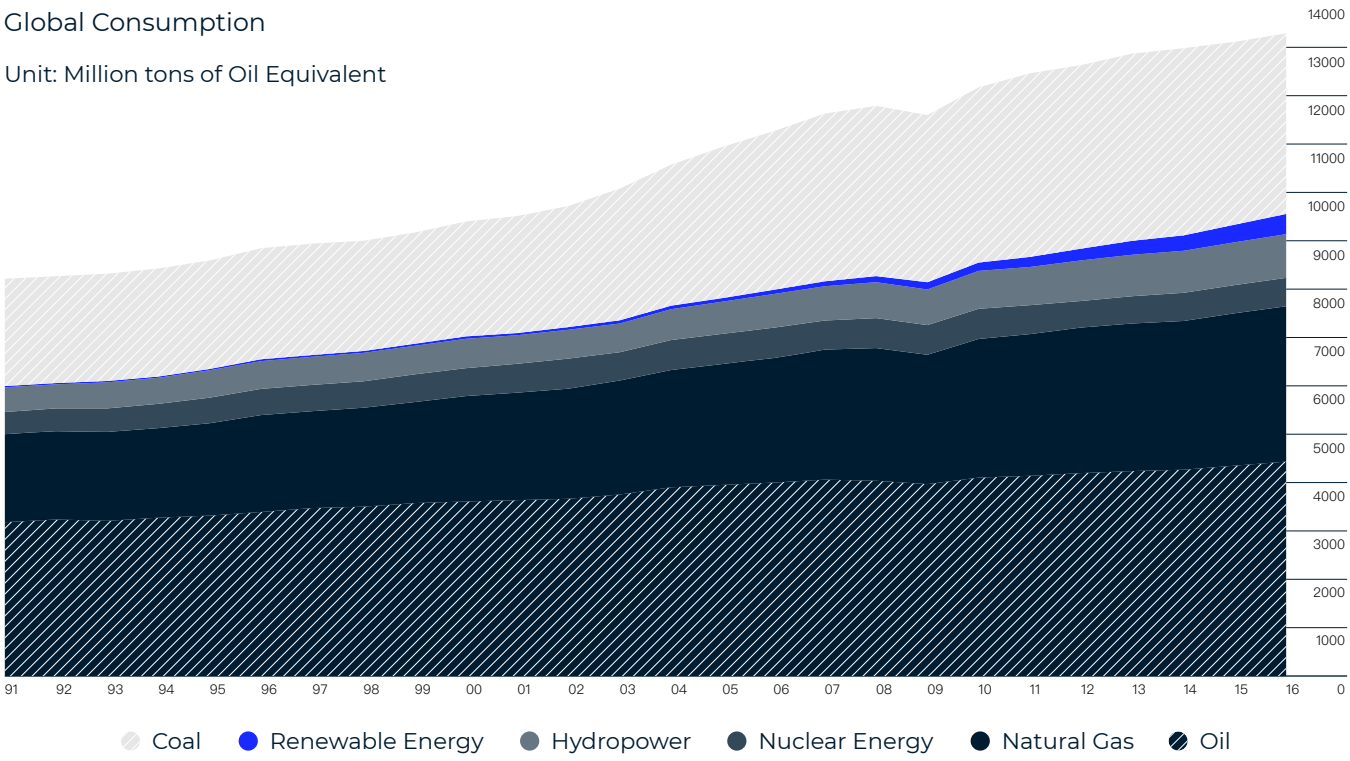
Energy is the foundation and driving force of modernization; however, currently, the supply of new energy sources has not been effectively matched by demand. At present, wind and solar energy account for a low proportion of global energy consumption. The supply of renewable energy is sufficient; however, due

to the lack of effective free market energy exchange, energy storage equipment, and effective real-time trading means, the supply and demand of new energy is not balanced. As a result, renewable energy is not being utilized to its full potential.

Conversely, traditional energy, with its high prices and unwieldly environmental consequences, is comprising an increasing proportion of the energy industry.

Global Consumption

Unit: Million tons of Oil Equivalent



Source: BP World Energy Statistics Yearbook

According to the BP World Energy Statistics Yearbook, the global energy consumption report shows that primary energy such as oil, coal, and natural gas still accounts for the vast majority of energy consumption. While sustainable energy such as hydro-power and nuclear power have increased in recent years, overall consumption is still low.

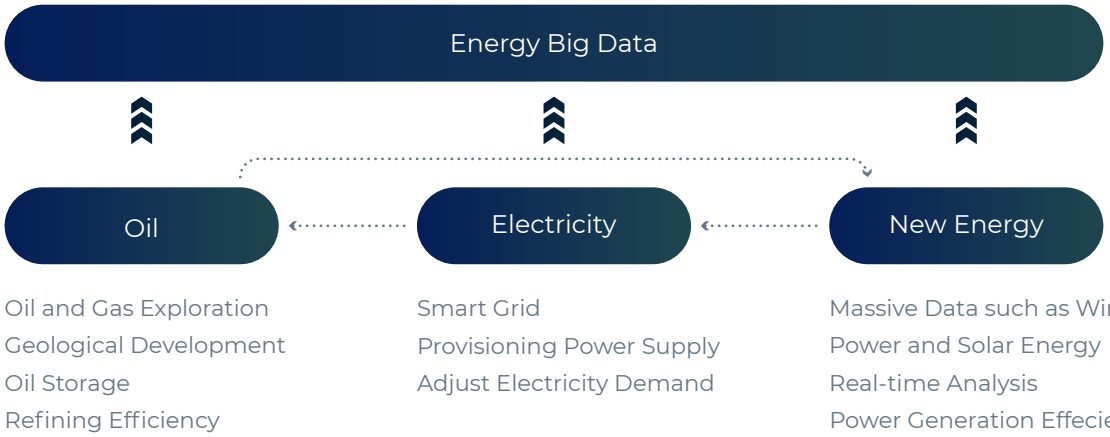
In China, energy consumption has always been dominated by coal. In 2013, coal consumption accounted for 66%, oil consumption accounted for 18%, natural gas accounted for 5.8%, and hydropower, wind power and nuclear power combined accounted for only 9.8% of national supply.

This 9.8% is not an accurate reflection of renewable energy capabilities. The solar energy reaching the earth in one hour is enough to supply global energy demand for one year. The solar resources collected and obtained are huge, but they cannot be fully utilized due to many technical bottlenecks, such as limited battery storage and non-peer-to-peer transactions.

Low utilization of energy data

Energy transaction data held by individual energy enterprises is not shared, forming information islands, which negatively impacts the development of the energy market. In the field of oil energy, the applications of oil data warehouse, big data of oil refining and oil sales, and offshore oil exploration are the junctures of energy data and oil industry.

In the field of electric energy, the promotion of new smart grids will drive demand for energy big data that will regulate the peaks of electricity consumption and generate energy savings for households and industrial users. These demands will lead to a rise in the range of smart devices and data analytics vendors.



In terms of new energy, energy data needs are difficult to meet. By the end of 2013, China's installed wind power capacity had exceeded 91 million kilowatts, nearly 70,000 units were put into operation, and 2,100 wind farms were connected to the grid. Unfortunately, the accumulated massive wind power operational data has not been effectively utilized; as a result, annual wind power generation has not reached its expected target. The design and operation of wind farms are not optimal, and the design deviations make it difficult to achieve a measurable design index. By analyzing the data, many measures to improve the power generation performance can be found. The blockchain can empower active data transactions in the wind turbine sector, a fundamental step towards utilizing the huge data potential in the energy market.

Technical Solutions of the Echoin Public Chain

The Echoin public chain is designed to create a decentralized energy trading network using blockchain technology. The trading network can provide the infrastructure necessary to address all the shortcomings of the energy industry discussed in the previous chapter. These industry shortcomings, as well as the business needs of the energy trading network, are highly industry specific and are not addressed by general blockchain technologies (such as Ethereum). Echoin is a new public chain system, with unique technical characteristics, designed to address the unique problems faced by the energy industry.

The Echoin Ecosystem will use a double token system. EC is the gas in the Echoin public chain ecosystem, used to pay the labor remuneration of network maintainers and verification nodes. The EUSD is a stable currency generated by the pledge of fiat currencies (i.e. US Dollars). EUSD will be issued on the Echoin public chain, and its security and credibility will be guaranteed by bank(s) and/or other independent agencies.

The Echoin public chain, optimized for the energy industry, has the following technical features to support specialized energy industry application scenarios:

Oracle machine puts the IoT data on the blockchain

The IoT connects all the energy equipment and related information to the chain, and the Oracle machine provides automatic transaction and energy transportation solutions using blockchain technology.

The Oracle machine will be used to import information from the real word to the blockchain. Blockchains are unable to directly upload external information; therefore, there is no direct method to verify the conditions required to trigger a smart contract. The Oracle machine provides the infrastructures enabling the fulfillment of the required conditions. The smart contract condition parameters are variable and may include temperature, completion of payment, energy price alterations, etc.

The blockchain can store the key data of all the nodes and parameters within the network, such as energy flow, scheduling, and settlement payment data.

Blockchain can assist with the decentralized decision making used for energy distribution. Decentralized decision making depends on the coordination of various nodes and scheduling modules within the

distributed energy system and is responsible for ensuring the continual efficiency of the entire system.

The energy transaction data on the blockchain cannot be falsified, largely solving the transaction trust problem, reducing the credit risk, and improving the credibility of the energy transaction participants.

Hierarchical and high frequency trading in the microgrid market

Firstly, Echoin plans to introduce a secondary network based on Plasma data. Plasma: Autonomous Smart Contracts (Vitalik Buterin and Joseph Poon, 2017) was the first introduction to Plasma technology. Ethereum's expansion solution will enable Ethereum to handle far more transactions per second than it does presently. Plasma is a technology for managing transactions off the chain, while relying on the underlying Ethereum blockchain to achieve total security. Plasma adopted a new approach by creating a "sub-chain" that is attached to the "main" Ethereum blockchain. These sub-chains can in turn generate their own sub-chains, which can be cycled back and forth.

The result is the ability to perform multiple complex operations at the sub-chain level, while running a complete application with thousands of users, that has minimal interaction with the main chain. The Plasma sub-chain can move faster and take on lower transaction costs, because the operations on it do not need to be repeated on the main chain. Plasma allows Echoin to achieve faster, more secure energy trading. The goal is to automate a large number of verification efforts and simplify complex encryption economic strategies, which will be detailed in the next section.

Secondly, the Echoin public chain has a built-in decentralized trading platform that allows businesses and individuals to create energy wallet accounts. Exchanges are settled with stable coin EUSD, and any participant can apply for their own trading pair, which converts light, electricity, natural gas and petrochemical energy into digital assets. These digital assets can be freely traded among users within the ecosystem, providing a channel for mutual energy conversion. Excess renewable energy can be purchased through the conversion of retail energy, which greatly improves the utilization efficiency of renewable energy and promotes the structural improvement of the energy industry.

In the energy trading process, after the participants reach bilateral or multilateral agreements, the platform automatically generates smart contracts, which include details such as trader identities, energy quotas, prices, trading time, and default amounts. In addition, the system uses a private key for multiple signatures, guaranteeing contracts cannot be tampered with. The smart contract generated by the transaction is not only defined by the code but is also enforced by the code. The smart contract parties do not need to trust each other, nor do they need the supervision of a trusted intermediary. The process is completely automatic, reducing the cost of the high-frequency, small-value transactions. Once the smart contract is secured, funds are allocated according to the terms of the contract. Only when the pre-set conditions of the contract are met can the funds be used. During the contract period and after the contract is concluded, neither party can control or misappropriate funds, ensuring the security of the funds. In addition, the content of smart contracts stored in the blockchain can only be altered if all contract signers agree. Smart contracts make transactions fair, equitable, cost-effective, efficient, and

impossible to tamper with.

The public chain Echoin can process transactions according to smart contracts and adjust and control the cost of gas according to market participation. That is to say, energy pricing during the execution of the intelligent contract can be adjusted to reflect real-time energy consumption. Since the transaction settlement process is based entirely on smart contracts, there is no need for human participation or third-party institutions to hold or lend trading funds. The data is fair and cannot be falsified, and the process can be traced back and queried. Significant time and effort are saved for both businesses and individual users in the energy transaction settlement process.

The decentralized energy trading platform on the blockchain also has the ability to solve supply chain finance and cross-border settlement issues, as explained in the next section.

Supply chain financing and cross-border settlements

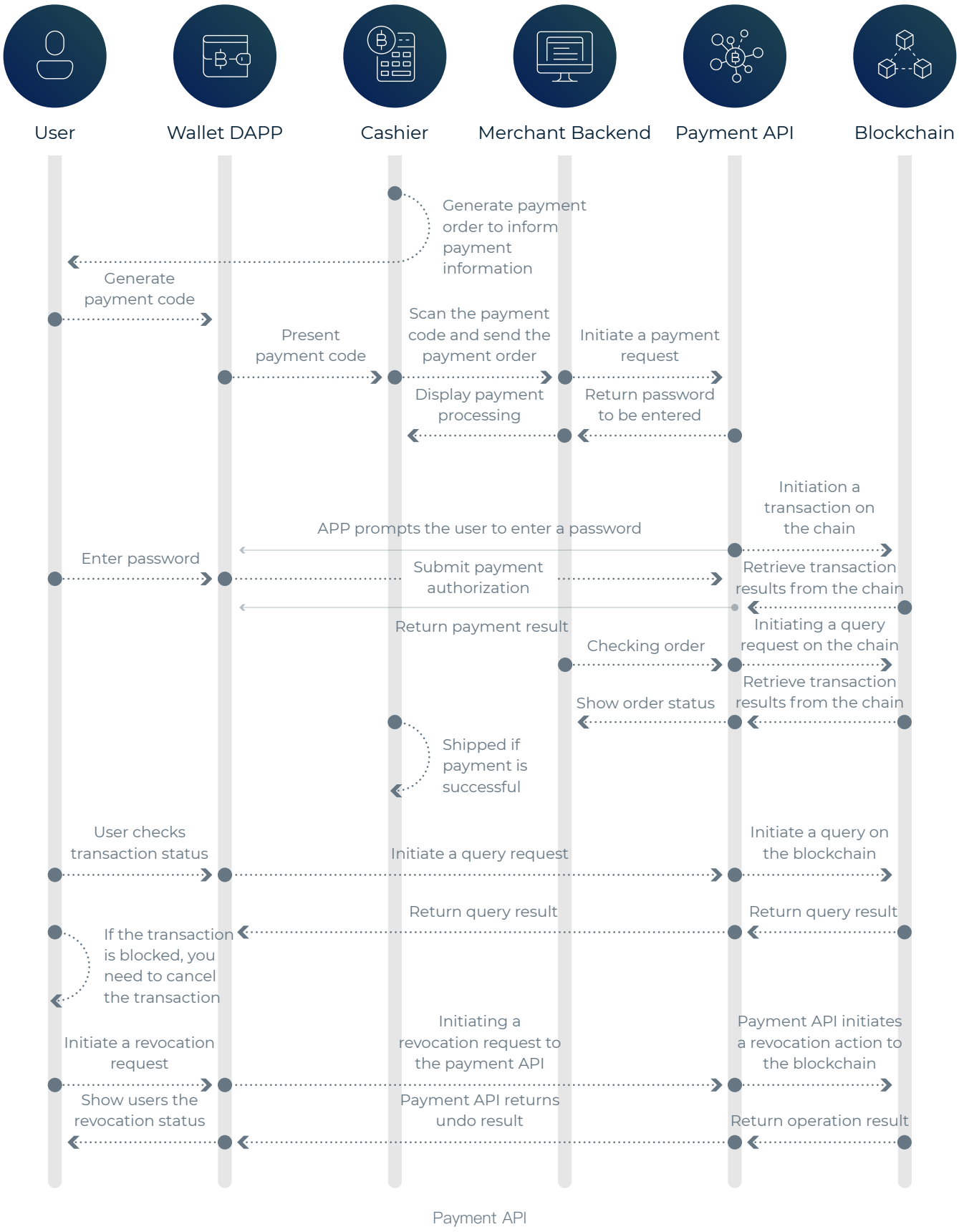
In energy trading, the data of tens of billions of dollars will be an asset to the Echoin public chain. The data can be used as a credit indicator for companies and other participants, giving participants the opportunity to provide loans based on credit scores. Smart contracts on the chain provide the energy trading platform and its upstream and downstream enterprises with energy trading smart contract templates for accounts receivable, future cargo rights, pledge warehousing, etc., which assist enterprises with their daily operations.

The EC price fluctuates greatly with respect to legal tender, creating a need for currency stability. A stable currency EUSD will be issued by Echoin, supported by assets. EUSD can provide liquidity at a low cost based on smart contracts. EUSD will have numerous applications; participants of Echoin could exchange EC for EUSD to pay for services in the ecosystem; developers could develop plugins for Echoin, enriching the features of the Echoin system, and get paid in EUSD.

Echoin - a more convenient payment platform/system

Echoin will develop a user-friendly blockchain wallet with a payment function. The payment currency is the stable currency EUSD.

Echoin, the energy public chain, provides enterprise-oriented services and launched a ToB commercial services level wallet (E Pay) API interface to help the B-side open channels to traditional businesses and blockchains. The payment API helps DAPP's applicable platform extend to the mobile side. In addition to the basic functions such as query, transaction, and billing, the eco-participants can also synchronize with smart contracts to accelerate and cancel transactions.


User
Wallet DAPP
Cashier
Merchant Backend
Payment API
Blockchain
Generate payment order to inform payment information
Generate payment code
Present payment code
Scan the payment code and send the payment order
Initiate a payment request
Display payment processing
Return password to be entered
Initiation a transaction on the chain
APP prompts the user to enter a password
Enter password
Submit payment authorization
Retrieve transaction results from the chain
Return payment result
Initiating a query request on the chain
Checking order
Retrieve transaction results from the chain
Show order status
Shipped if payment is successful
User checks transaction status
Initiate a query request
Initiate a query on the blockchain
Return query result
Return query result
If the transaction is blocked, you need to cancel the transaction
Initiating a revocation request to the payment API
Payment API initiates a revocation action to the blockchain
Initiate a revocation request
Payment API returns undo result
Return operation result
Show users the revocation status

Payment API

Data encryption and decryption on the blockchain

Since the information on the blockchain is public, it is accessible to everyone; however, there are numerous situations where it is advantageous to keep information in the energy trading ecosystem confidential, especially identity information and sensitive data. This requires the Echoin ecology to store data off the chain and verify it on the chain and requires a high level of encryption built into the system.

According to developers' experience with Ethereum, this type of operation requires virtual machines (VM) to be optimized before information is validated on the main network. The VM will be redesigned to reduce the high costs associated with encryption and decryption. Numerous computational encryptions and decryptions will be conducted to protect the privacy of users, for a small operational fee.

Data analysis and market algorithm solutions

To solve the problem of information silos in the energy trading market, Echoin builts the analysis algorithm into the virtual machine. At present, no energy enterprise or participant in industrial chains is able to achieve data interoperability, resulting in a large amount of information asymmetry. Echoin hopes to aggregate the analysis, integrate the data, and minimize the cost of information asymmetry. Most of the data is stored off the blockchain, and a hash computed from the data is stored on the blockchain to verify its integrity. The off-chain data cannot be altered without changing the hash on the chain.

Ideally, the analysis of most offline data should be performed by smart contracts, so other smart contracts on the Echoin blockchain can have access to the analysis results. However, if the Ethereum blockchain is used, the data-intensive analysis algorithm runs very slowly and consumes a lot of gas. In most cases, the operation fails on the Ethereum blockchain due to the high gas requirements. In addition, if the underlying data is sensitive, the data owner typically encrypts it, and zero-knowledge (ZK) analysis of the data must be performed by the smart contract. The zero-knowledge algorithm is computationally intensive and simply cannot operate within the normal range of Ethereum gas limits.

By integrating customized virtual machines, the Echoin blockchain can encompass energy-specific business analysis and high-performance implementation of these algorithms and functions. These features will continue to evolve and improve, which will be detailed in the next section.

Integration with energy peripheral industry trading systems

Energy trading generally cannot be completely closed, because the parties involved purchase energy and need to utilize it in other industries or sectors. So, a currency designed only for energy trading does not have a complete application scenario. The energy trading currency needs to circulate with other public chain ecological currencies in the application. The exchange of values between these public chains requires cross-chain and exchange technologies, which is the infrastructure that Echoin's public chain will provide.

The specific implementation of cross-chain technology and decentralized exchanges will be elaborated in the next chapter.

Technology Solutions for Echoin

In the previous chapter, we discussed the unique technical characteristics of the Echoin public chain. These features enable Echoin to support a wide range of business applications, specifically designed to meet the needs of the energy industry. In this chapter, we will outline the technical methods used to support these features and goals.

The Echoin public chain is fully compatible with the Ethereum blockchain. This allows for the use of an active developer community in the Ethereum ecosystem. Most major technological advances in the area of blockchain including new consensus mechanisms, fragmentation, and secondary networks, are from the Ethereum community. It is Echoin's fundamental goal to continuously contribute to the community and receive reciprocal rewards.

Based on the Ethereum technology stack, Echoin made two major improvements:

- It uses an extensible and Ethereum compatible Oracle machine. One key to the design of this virtual machine is its scalability. New features were added to the virtual machine that allow the Echoin blockchain to be optimized for energy applications.

- It uses a Delegated Proof of Stake (DPoS) consensus mechanism rather than Ethereum's Proof of Work (POW). We believe DPoS is more suitable for the energy industry, where the business environment is dominated by large companies that work cooperatively. Through appropriate governance rules, the performance of the DPoS consensus mechanism may greatly exceed that of POW.

Echoin virtual machine

We have considered the importance of integrating with established entities in energy industry. Customers already invested in the traditional energy sector should not be expected to purchase EC gas when executing smart contracts. To address this issue, after an in-depth study of the EVM operation code, we introduced native authorization transfer functions. Enterprises can authorize users to execute transactions for free, and users do not need to pay additional fees when triggering the smart contract.

Typical energy use and energy trading scenarios involve multiple real-world identities and confidential records. Echoin designed the contract data sensitivity mechanism, by introducing native function implementation for encryption and decryption. The mechanism greatly reduces gas consumption, allowing the public chain to provide trusted and encrypted transactions suited for the energy industry.

The Echoin virtual machine saves developers from unintentionally altering participants' assets. The code checking mechanism checks for potential errors such as integer overflows, and accidental transfers to unsupported contract addresses. These measures protect developers against otherwise precarious situations, when unthoughtful and potentially flawed implementations may have otherwise devastating consequences.

Delegated Proof of Stake (DPoS) Consensus Mechanism

Echoin will adopt the DPoS's consensus governance mechanism, a liquid democracy. The authentication node of the Echoin network will contain 25 major stakeholders, comprising of members of leading organizations and enterprises in the energy and blockchain industries.

The authentication node will act as the trusted party on the blockchain network; therefore, effectively selecting and monitoring the node will have a profound impact on the success of the DPoS governance mechanism. The committee members must have an established reputation as industry leaders. The Commission encourages geographical diversity, as a means of promoting alternative perspectives. Committee members must have the technical prowess to execute the Echoin technology road map, a strong business background, insights into economics and monetary markets, and legal expertise.

Echoin's governance principles are designed to ensure that no single committee member has absolute control, and that the actions of a small group of members will not have an excessive impact on the entire ecosystem. The members of the committee must agree to accept demotions as a punishment for not adhering to committee guidelines. When misconduct occurs, part of the offenders pledged EC will be cut or burn. Examples of misconduct include absence from voting on new blocks, delaying packaging of new blocks, producing invalid blocks or recording illegal transactions in blocks. This design prevents a small number of players from colluding to attack the system, forging crypto currencies, or improperly modifying the decentralized ledger.

The Echoin public chain is based on the Tendermint consensus engine. Tendermint has the following characteristics: 1. It is Byzantine fault-tolerant, with up to one-third of the Byzantine nodes being destroyed. 2. The most recent block formed by the consensus is the final block. This mechanism can eliminate the possibility of fork. 3. Consensus efficiency is high. TPS can reach a thousand. The Tendermint consensus engine can be used by both public and private chains. Many blockchain projects (e.g. Cosmos) use the Tendermint consensus engine.

Echoin developed the asset pledge and delegated voting module based on the Tendermint framework. It forms a DPoS consensus mechanism that is well suited for energy industry scenarios. Echoin's DPoS backbone can handle more than 3,000 transactions per second (TPS). This meets the demands of most low-frequency energy transaction scenarios, such as fueling and electric vehicle charging.

DPoS also supports quick transaction confirmations. The Echoin node has cache functionality and can

automatically retry failed transactions. In addition, it secures the execution of large transactions, which are common in energy transactions.

Application-specific Plasma Architecture

The Echoin blockchain's main network supports 3000+ TPS and should be sufficient for most low-frequency energy trading scenarios; however, it is not sufficient for some specific automatic real-time energy exchanges, such as solar and battery energy exchanges on a microgrid. These energy usage scenarios require the expansion of the Echoin blockchain with technical solutions that use a Plasma Data based side chain.

Secondary networks, such as State Channel and Plasma, are the most promising solutions for Ethereum expansion. While State Channel allows for fast-paced offline transactions through blockchains, Plasma tends to be more advanced, presenting a comprehensive encryption economy solution for performing any computational load outside the main chain, not merely simple transactions. Plasma permits the formation of smart contract derived sub-blockchains called sidechains formed from the main chain. Sidechains can be nested to create a multi-layered side chain structure representing different levels of local energy markets.

In addition to scalability improvements, a core advantage of using Plasma sidechains to address high-frequency energy transactions is the increased privacy. After the capital is deposited into the Plasma smart contract, the main chain stops displaying and tracking activities. No transaction value on the Plasma chain will be seen on the main chain, only the Plasma side chain's initial deposit and final withdrawal amount are visible. However, for regulatory compliance and auditability purposes, the Echoin block chain is required to occasionally store hash values or encrypted data from side chains on the main chain.

The side chain architecture introduces new opportunities to reinvent blockchain data management. Side chains have the ability to store and compute more data. These ideas in discussion are entertained on the presumption that the issue of a given blockchain's size, diminishes as its chain life decreases. It is also presumed that in some cases, a chain's distributed state does not need to be stored beyond real-time. For example, ephemeral applications consume and compute data, which is then passed on to other applications for further processing and/or storage. If side chain persistence is necessary, the side chain data could simply be deterministically hashed, compressed and then stored by a 3rd party. The hash of the side chain data could be forever used to provide a cryptographic guarantee of the original data's authenticity. Such cryptographic operations are often not possible with generic blockchain platforms like Ethereum, but Echoin will provide optimizations to support them, which will be discussed later in this section.

While the Plasma side chain design is highly promising, a concrete universal Plasma implementation is still under active research and development, because there are many technical challenges.

- The greatest challenge facing global enforcement of non-global data is lack of data availability and

withholding of data. Without complete and perfect consensus, it is impossible to detect whether individual participants are deliberately withholding information or genuinely waiting to receive information. For example, if a user on the Plasma network asserts that they have not received a particular block or transaction, one of two scenarios is possible. Either the user is being honest and did not receive the block, or the user is refusing to recognize that the block or transaction has been made available to them. In this regard, Plasma fundamentally relies upon its users to be responsible for monitoring Plasma network activity. In the event of malicious activity, Plasma requires that its users instantly request to exit the Plasma network. Unfortunately, this type of forced exit creates another problem known as a griefing vector.

- A griefing vector is present when the two parties involved in a transaction do not properly communicate and cooperate. An example of this is when the sender of funds does not know if the intended receiver of those funds is a) maliciously refusing to acknowledge funds received, or b) genuinely waiting for funds to be received. In this example, if the sender requests to exit immediately (suspecting the receiver of withholding) then the receiver can issue a challenge moments after the sender announced their exit. At the very least, deliberate withholding stalls the networks activity, but it will ultimately lead to the collapse of the network, as well-meaning users will exit out of fear of foul play.

- Certainty and Atomicity. Before transferring and spending money on the Plasma side chain, all potential problems on the initial network must be resolved. Transactions with immediate certainty (absolute and irreversible) are called atomic transactions. The concept of atomicity is that if any part of the transaction fails in any way, every part of the transaction will be canceled (invalid). Achieving certainty and atomicity in a decentralized system is challenging. In fact, research shows that simplistic Plasma applications can face scalability problems when funds need to be transferred between different Plasma side chains. Therefore, it might be more efficient to conduct those transactions on the main chain. It is difficult to achieve atomicity and scalability using oversimplified Plasma applications.

The above issues and challenges are currently at the forefront of blockchain scalability research. It is difficult to find a generic solution to all of the issues. Fortunately, Echoin blockchain does not require a generic and Turing-complete side chain solution. Echoin optimizes side chain infrastructures that are specific to high-frequency and hierarchical energy trading.

Ultimately, Plasma provides an opportunity to create application specific blockchains. These application specific blockchains, which could be used in e-commerce, supply-chain and even information industries, are vastly different from the general Turing-complete main chains, which accommodate all use case scenarios. Specialized features and functionality of side chains would be analogous to thin-clients, which we see in the traditional (non-decentralized) client-server architecture, i.e. specialized lightweight point of sale systems.

This section will review specific restrictions and performance enhancements that the Echoin blockchain can implement in its Plasma architecture to optimize energy trading. These optimizations aim to restrict operations and computations on the side chain, so that the computer algorithms, instead of humans, can

deterministically solve data availability, finality, and atomicity problems.

Energy-specific use cases, supported by the Echoin blockchain, may impose significant restrictions on the types of transactions conducted on the sidechain. These restrictions allow transactions to be verified by smart contracts and derived from smart contract codes, rather than human participants in the encryption economy game. For example, multi-party signatures can be used to fully automate simple token transactions, which can be utilized in special cases for the State Channel, such as the Bitcoin Lightning Network. Smart contract transactions in a power microgrid can be categorized by known types and can be verified by functionality built into the virtual machine of the primary network.

- The price discovery contract is determined by the supply and demand curve and can be observed and recorded by any third-party node on the network. It also requires computationally intensive algorithms to process large amounts of real-time data, which is not possible on a generic Turing-complete virtual machine. On the Echoin VM, we can develop special libENI modules to do these tasks efficiently.

- Sidechains need to protect user privacy and encrypt/decrypt user data as needed. According to Ethereum's experience, this type of operation requires virtual machine optimization to be validated on the main network.

- Energy trading contracts in the Echoin side chain are long-term contracts, controlled by timers and settled on the main network. Echoin VM's ability to set the timing execution is a significant upgrade from the generic Ethereum VM.

The Plasma side chain protocol is currently being jointly developed by the Echoin Foundation and the CyberMiles Foundation.

Smart contract cryptography

Typical energy use and energy trading scenarios involve multiple real-world identities and a large number of classified offline records. Smart contracts support a variety of encryption features that are critical, including:

- RSA public key encryption and decryption
- DES and AES private key encryption and decryption
- Creation and verification of digital signature
- Proxy re-encryption

These encryption functions are computationally intensive and are, therefore, very expensive to implement in conventional Ethereum Virtual Machines (EVMs). In fact, simple cryptographic operations (such as RSA encryption and scrypt verification) are known to cost trillions of Ethereum units, which makes them impossible to implement in Ethereum smart contracts. On the Ethereum blockchain, these calculations must be performed offline. The results need to be validated through a complex request/response process and recorded on the blockchain.

The Echoin Foundation is working with the CyberMiles Foundation to create a comprehensive function library of high-performance cryptographic functions for virtual machines deployed on the Echoin blockchain. The functions are written in C++ and run at a cost of very little Gas, i.e. EC.

Using the encryption capabilities of these high-performance cryptographic libraries, Echoin developers and users can write smart contracts for trusted and confidential transactions on the public chain.

Trusted oracle machine

Since many traditional energy businesses exist off the chain, one of the main challenges faced by the Echoin blockchain is to introduce the off-chain data into the blockchain in a trusted manner, including data from the following cases:

- IoT data for electricity meters, charging stations, and gas stations.
- Fiscal transaction records of financial institutions.
- Deposits from traditional financial institutions.
- Energy product data.
- Ratings and statistics from third-party providers.

In a completely decentralized system, it is difficult to reach a consensus on the exact state of the off-chain world at all nodes. Since each node has different timers, hardware, and network conditions, different results may be obtained when querying external data sources. Oracles is the “authoritative” source of data off the chain. They collect offline data and act as a source for smart contracts on the chain; however, in traditional Ethereum, these oracles must be set up as centralized services (i.e., FedEx running oracle machines provides the FedEx running status) or community-involved cryptographic economic games (i.e. Ethereum timers or BTC Relay). Neither of these options are optimal.

The Echoin DPoS Consensus mechanisms may create special smart contracts that can only be updated by the current block generation node. Since DPoS block generation nodes are defined as trusted organizations in the network and are penalized for improper behavior, they act as “Predictor Machines,” able to import chain data into smart contracts.

The Echoin blockchain oracle machines are semi-trusted and semi-decentralized. They are not fullproof, due to possible programming faults and malicious behavior. They do not rely on either party to provide trust, instead, they are maintained by the DPoS block generation node at any given time.

Automated trading of cross-chain assets

Owing to the many participants in the complex energy industry, it is important for the Echoin blockchain to support asset exchanges across different blockchain ecosystems. There are two situations that must be taken into consideration.

First, Echoin must support asset exchange on its own Plasma data sidechains. While all Echoin sidechains are smart contracts with mutual interoperability, the Plasma protocol usually imposes additional requirements for security reasons, such as prohibiting the cancellation of deposits and exchanges between sidechains. Plasma data allows regular traders to exit the side chain after the transaction without having to disband the side chain itself. This provides great flexibility for asset exchange between different side chains. In addition, since all side chains on Echoin use Echoin tokens, it is easy to exchange ECs between side chain participants.

Second, the Echoin blockchain must be able to exchange assets with other public chains. We can use at least two methods:

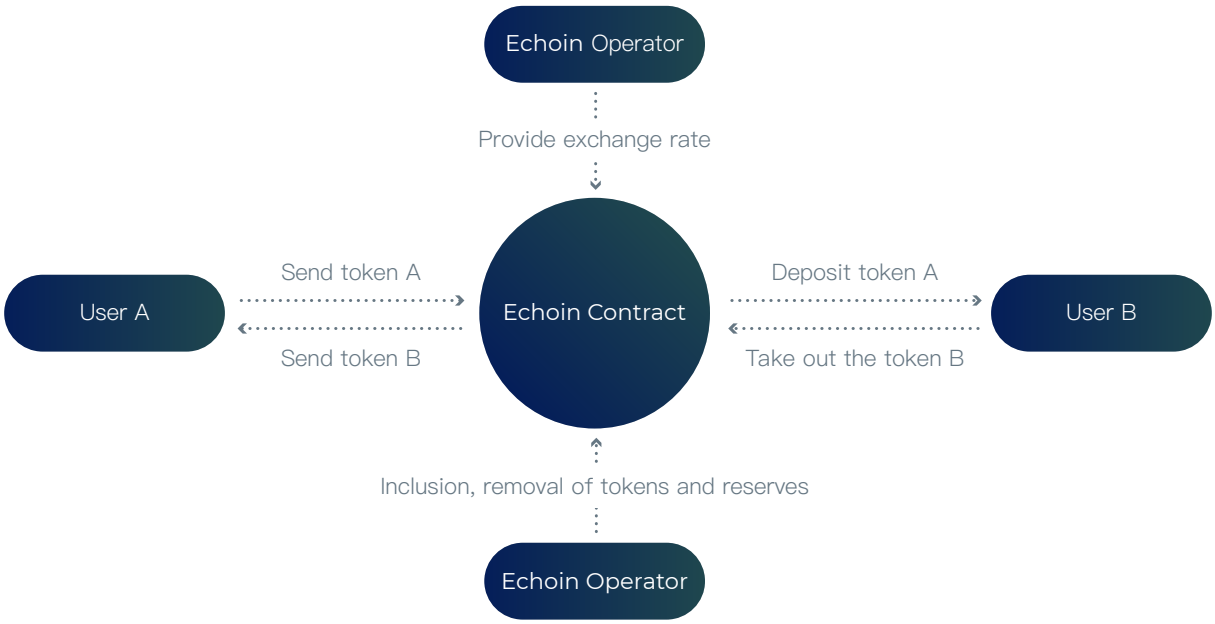
- Transaction verification contracts can be built on the Echoin blockchain through trusted Oracle machines and high-performance encryptions in smart contracts. For example, we can build a fully automated version of BTC Relay to monitor and verify bitcoin transactions on the Echoin blockchain. The automated version can react to Bitcoin transactions but cannot initiate Bitcoin transactions on its own.

- Cross-chain solution such as Cosmos InterBlockchain Communication (IBC)

Automated cross-chain asset transfer remains an active field for research. The Echoin blockchain has contributed to the implementation of the experimental design outlined in this section.

Decentralized transaction

In the world of application protocols and industry-specific public blockchains, encrypted transactions are basic infrastructure services that everyone uses. Encrypted exchange provides a super set of the functions of the cross-chain asset transfer center described above. For the sustainable development of the ecosystem, the Echoin Foundation will run decentralized transactions driven by its own protocol. The Echoin Foundation will operate as a community service with two types of decentralized transactions.



First, any foundation or business entity on the platform can create a series of smart contracts to match the trade order, then execute the matching order. This form of decentralized trading includes the Kyber network and ByteTrade. Together with the DAPP UI, cryptocurrency users have the ability to trade through these transactions; however, these decentralized exchanges lack transaction depth. Matching and executing pairs of buy/sell orders can be time-consuming. This problem can be alleviated by focusing the exchange on energy-related transactions, as institutional transactions tend to have high transaction volumes and tightly matched prices. For exchanges created by the Echoin Foundation, trading pairs related to EC and EUSD will always be supported.

Second, the foundation will deploy an algorithmic contract to capture the long tail of the transaction. The algorithmic contract utilizes the Bancor protocol and takes EC as a margin. Then, the Bancor contract will implement algorithmic pricing for all tokens in the system, without needing to trade counterparty orders. The agreement is new and is still developing the appropriate market validation. The Echoin Foundation will use the latest and most advanced Bancor protocol updates in the upcoming months to develop its own long tail trading system.

Decentralized transactions supplement centralized energy trading, providing more liquidity to energy trading partners in the Echoin ecosystem.

Stable coin

The EUSD stable currency is a large component of the Echoin block chain economic system's design.

The EUSD can be exchanged with USD at a 1:1 ratio at any time, guaranteeing value stability. EUSD are issued as an "ERC20" compatible token on the Ethereum-compatible Echoin blockchain. The security and

integrity of the EUSD is supported by the Echoin blockchain ecosystem. The Echoin council members and block producers receive a small gas fee in EC for every EUSD transaction.

The EUSD is fully collateralized, backed by the USD deposited into the system by Echoin users to support energy transaction settlements. The chief advantage EUSD has over USD is the lower transaction fees and faster trade settlement speeds along the long and complex energy supply chains. In order to be successful, EUSD currency must have a variety of use case scenarios; otherwise, EUSD recipients will redeem the EUSDs for USDs as soon as they receive them. When a seller receives EUSDs as a payment, they can use the EUSDs to:

- Sell EUSDs to buyers and other users in the Echoin ecosystem. Exchange services are a critical component of the Echoin ecosystem. Since the users can trade EUSDs against other cryptocurrencies such as EC, BTC, ETH, and even USDT, the EUSDs traded on Echoin ecosystem's crypto exchanges incur much lower transaction fees compared to flat currency exchanges.

- Use EUSDs to pay suppliers. The sellers at the end of the supply chain still need to exchange to USDs either through redemption of the EUSD or by selling EUSDs to other participants in the Echoin ecosystem through the above-mentioned exchanges. The long and complex energy supply chain enables this functional use of EUSD.

The Echoin protocol encourages sellers and recipients to hold EUSDs for further use and encourages investors to convert their USDs to EUSDs by depositing them on the platform. The exact parameters, such as shared transaction fees and asset management profits, will be set by the Echoin council. The mechanisms to encourage EUSD holding are as followed:

There is a small transaction fee for each EUSD transaction. The EUSD transaction fee is much lower than what banks charge for USD transactions but is not zero. The EUSD holders are entitled to receive a portion of these transaction fees. If the USD deposit is used to generate income as part of the asset management, the EUSD holders are entitled to receive a portion of such profits as well. There is a banking fee for redeeming EUSD for USDs.

A key characteristic of a fully collateralized stable coin system is the Proof of Solvency (PoS). The system requires audibility so that:

- Users who deposit USDs to create EUSDs can be assured that their deposits are not misused.

- Users who accept EUSDs in energy trading can be assured that the EUSDs can be redeemed for USDs at any time.

The Proof of Solvency is achieved by utilizing trusted Oracle services on the blockchain platform. Only the auditors authorized by the Echoin council have the right to access and make changes to the EUSD issuance smart contracts. The auditors have access to the bank accounts that hold the USD deposits,

as well as the operations of the entities set up by the Echoin Foundation to manage the redemption of EUSD to USD. The auditors publish solvency reports through those smart contracts and can change the parameters or even algorithms governing the EUSD issuance as needed. The technical architecture of the EUSD smart contracts are as followed:

There is a public ERC20 interface exposed by the EUSD contract, but all function executions are delegated to the implementation contracts. Only current block producers, as elected and specified by the council members, have the authority to specify which implementation contract will be used for the interface contracts. This is done through the use of Oracle technology on the Echoin blockchain, discussed earlier in this paper. The implementation contract is provided by the auditors. There could be multiple versions, but at any given time, only one of the implementations is selected.

The EUSD is a crucial piece of the Echoin ecosystem. The foundation aims to implement a stable coin system that is optimized for energy trading and marketplaces.

Token Economy

Similar to ETH on Ethereum, EC is the token of Echoin's public chain's trading, pledge, and execution of smart contracts. It is both a medium of exchange and asset for storage.

Trading medium

In the Echoin ecosystem, the fees for all public chain services, including transactions, pledges (participation in public chain governance, issuance of stable currencies), and execution of smart contracts must be paid in EC tokens. The EC is the trading medium for all services in the energy market.

Storage value

All parties in the Echoin ecosystem must hold EC tokens to perform operations in the ecology. Position locking can increase the cost of the members' infractions. The unit price of the EC depends on the total trading volume of the ecosystem and the circulation speed of EC. The regulation of position locking will play a role in limiting the circulation speed of EC, which effects the value of EC tokens, creating a stable monetary system. The value exchange equation is as follows (Bordo 1987).

$$M \cdot V = P \cdot Q$$

- M is the size of the asset base, which is the value of the U.S. dollars, represented by the tokens.
- V is the currency circulation speed. For the U.S. dollar, M2's currency circulation rate is about 1.5. We choose M2's currency circulation speed here because the M2 money supply is composed of savings accounts and money market accounts and is most similar to the EC's lock-in mechanism.
- P is the price of digital services, and Q is the number of digital services. In the Echoin ecosystem, we will combine PQ's commodities as the "GDP" of the total network transaction.

We believe that the future application scenarios of the Echoin public chain are in the "advanced energy market", so we calculated this section of the market rather conservatively. In 2015, the scale of the advanced energy market was $1.4 trillion per year. According to the annual growth rate of 7%, it is expected to reach $1.96 trillion per year by 2020. We believe that Echoin can eventually occupy 1-10% of the energy market's advanced energy market share. At the same time, we estimate that the various service revenues of Echoin Energy Trading Platform account for 5% of its trading volume (total turnover or GMV).

Since the value of future funds are lower than current funds, we converted the market value in 2020 into present value, assuming a benchmark interest rate of 8% and n = 2.

$$\text{Discounted} = \frac{P_n \cdot Q_n / V_n}{(1+r)^n}$$

Based on this formula, used to estimate the market value of EC, the figure for 2018 is calculated to be $490 million (1% market penetration) - $4.9 billion (10% market penetration).

Target Market for Echoin

Echoin's potential market involves all participants in the energy industry. Echoin integrates surplus power generated by solar power, small hydropower plants, small-scale fossil fuels, energy from organic/biogas generators, and surplus energy from personal and institutional users. In doing so, Echoin reduces waste and increases the proportion of new energy in total energy consumption. The energy data trading market built by virtual machine algorithms and smart contracts will greatly improve energy data utilization and break the trend of user transaction information islands, leading to higher market efficiency.

In the initial market development phase, the Echoin Foundation will focus on building a public chain ecosystem, which aims to ensure a more reliable, safer and more affordable decentralized ecosystem.

Energy will always be closely linked to people's lives. The development of blockchain technology has given energy a new means of production. Echoin public chain solves the inherent shortcomings rampant in the energy sector and re-allocates non-utilized and decentralized energy to supply the market demand. Simultaneously, Echoin provides services to energy companies, creating an ecological bottom layer for the fair, free, and convenient circulation of energy by economic participants in different roles such as individuals, companies and developers.

The Foundation will cooperate with CZB and other partners to actively expand the ecological participants. The Echoin Foundation is confidently building the first energy chain, significantly reducing energy industry costs, improving energy supply and demand structures, and empowering small organizations and individual participants.

Echoin Roadmap

February 2018 . . . . . Project launch

Q2 2018 . . . . . Launch of test-net and blockchain browser

Q3 2018 . . . . . Launch of decentralized wallet

Q4 2018 . . . . . Launch of test-net of decentralized energy exchange

Q2 2019 . . . . . Launch of main-net, decentralized energy exchange, docking virtual machine and DPoS consensus governance

Q3 2019 . . . . . Facilitating ecological scene template and implementing solutions for CZB 365 and EDF

Q4 2019 . . . . . Developing side chain platforms to adapt to high frequency trading scenarios

Q1 2020 . . . . . Docking Cosmos cross chain technology

Q2 2020 . . . . . Begin running off line market analysis data

Core Members

Gavin Zheng CEO & Chief Scientist

Co-author of Blockchain for Dummies, Mr. Zheng received a B.S. in Computer Science from Huazhong University of Science and Technology, a master's degree in Information Science from McGill University, and an MBA from Rotman School of Business at the University of Toronto. He has design and development experience in blockchain-based quantitative trading platforms and served as a technical product manager and technical architect at Bell Company for 10 years. In 2012, he began researching Bitcoin, Ethereum, LeoCoin, Ripple, and Hyperledger and developed a payment gateway based on Ripple, and Ethereum-based smart contract products.

Wang Xiao CTO

He graduated from Xi'an Jiaotong University and served as technical director of Huakaixing (Kaspersky). Later, he served as technical director of UC business unit of Alibaba Mobile Group. He has rich experience in technology management of large-scale projects. In 2016, he entered the blockchain industry and led a team to develop a decentralized wallet project. He is personally proficient in the Rust and Go technology stacks.

Liu Caihe Chief Scientist

He graduated from Beijing University of Aeronautics and Astronautics and served as the technical director of Tencent Interactive Entertainment. During his stay with tescent, he led the team to construct a number of large-scale online game engines, designed multi-domain and cross-platform commercial infrastructure. After joining the well-known permissioned chain project in China as an architect, he is familiar with security protocols and encryption algorithms, and has in-depth research on btcd, fabric, and ethereum.

Jiang Shengqiu **Core Developer**

The former technical director of CZB. Later he entered block chain industry. He led large-scale exchange wallet system, back-end secure payment system design, and construction, and is expert indata structures and algorithms.

Consultants

Daive Dai Consultant

Dai Zhen earned a duel undergraduate degree in engineering and literature and an MBA from Dongbei University of Finance and Economics. His major focused on hydrogen fuel cells and hydrogen storage of carbon nanotubes. He was previously employed at Zhengyuan (600321,A shares) and Red Star Macalline (01528, HK) (601828,A shares) Enterprise. Currently, he is the founder of China's largest energy Internet company CZB365, which links nearly 100 cities of refined oil supply channels with roughly 200,000 charging piles, serving more than 100 mainstream logistics and commercial vehicle companies (including Didi, SF, etc.).

Yuehua Wang Consultant

Mr. Wang holds a master's degree in telecommunications engineering from National Chiao Tung University and is a partner at the DFJ Dragon Fund China (now DraperDragon Fund). He has 18 years of experience in the semiconductor industry. After three ventures, he joined the DFJ Dragon Fund, transforming from an engineer to investment. His investment portfolio focuses primarily on artificial intelligence, financial technologies, and blockchain.

Robert Mao Consultant

Mr. Mao is a technology innovator and entrepreneur. He is classified as an outstanding talent by the US government and was invited to be an expert speaker at the World Wide Web Consortium. He was previously employed at the Microsoft Research Institute and now serves as the chief technical architect at ArcBlock, a blockchain application ecosystem service. He is the founder and CEO of ArcBlock Inc. and the co-founder and chairman of the Seattle Entrepreneurship Association.

Lucas Lu Consultant

Dr. Lu earned a PhD in Particle Physics from SMU in 2005. He worked at CERN, where he participated in theoretical and experimental research of Higgs Particles. Dr. Lu was the co-founder and CTO of Light in the Box, eventually taking the company public on the New York Stock Exchange. Prior to that, Dr. Lu was the first GM of Alibaba's Taobao Mobile platform. Lucas founded 5miles in 2014.

Andy Li Consultant

Andy Li, the founder of ELONCITY and POMCube Inc., is an expert in traffic network engineering and edge node entrance/exit queuing. He was previously employed by Cisco, China Cache, and Alibaba Cloud Computing. At the end of 2014, Mr. Li founded POMCube, which utilized ToU arbitrage to reduce taxpayer's electricity bills and developed more efficient battery energy storage systems (BESS). In 2018, Li founded ELONCITY, a company dedicated to using block-chain technology to develop sustainable renewable energy and providing affordable electricity to consumers globally.

Michael Yuan Consultant

Mr. Yuan earned a PhD in Astrophysics from University of Texas at Austin. He has authored five books on software development, published by Prentice Hall, Addison-Wesley, and O'Reilly. He was an active code committer in large Open Source projects such as Firefox, Fedora, and JBoss. He is an expert in enterprise and mobile software and was a Principle Investigator for multiple research projects funded by the U.S. government.

Weizu Ni Consultant

Mr. Ni obtained his Ph.D. from Johns Hopkins University and is the Vice President of the University of Massachusetts. He is an "American Science Celebrity." At the University of Massachusetts Dartmouth, he founded the unique high-tech center and became the center's first director. In addition, he founded the Applied Engineering Research Laboratory at the University of Notre Dame. Dr. Ni has published 54 professional papers and is the owner of 52 patents. He is employed as a consultant to 25 different governments, organizations or private companies in Europe, South America, Japan, Taiwan and Mainland China.

Yibo Wang Consultant

Dr. Wang is a Doctor of Engineering and is currently working as the director / lead researcher in the Renewable Energy System Research Department at the Chinese Academy of Sciences. Dr. Wang has been engaged in research on renewable energy system technologies for more than 20 years and led a team to obtain the world's first ±10kV/200kW photovoltaic DC-boosted grid-connected converter and China's first 200kW self-synchronous voltage source inverter. In the past five years, he has presided over the implementation of national key research and development projects in China and has obtained fruitful scientific research results.

Ecological Strategic Partners

CZB 365 is the world's largest online energy retail enterprise and has established partnership agreements with China's TOP 100 commercial vehicle platforms. Currently, China's public charging piles integrated into the system of CZB 365 account for 75% of the total public charging piles, covering 306 cities and 30 million commercial vehicle end users.

Echoin has developed a strategic cooperation with CZB 365, and Echoin will provide services for more than 10000 gas stations and 200,619 charging piles in CZB 365's ecosystem. CZB 365 will be the first application in the Echoin public chain. These 30 million users will jump start the Echoin ecosystem.

EDF: Electricite De France, founded in 1946, is a state-owned enterprise responsible for the development, transmission and distribution of electricity in France. EDF controls one of the world's leading energy markets and is one of the world's largest power suppliers.

The Echoin Foundation has signed a partnership with EDF. Echoin will provide community microgrid solutions to EDF. In the future, EDF will become an Echoin side chain and contribute to ecological construction, in the aim of promoting the development of the global energy industry.

Ecological Co-construction Partners