New Energy Industry

Whitepaper

CONTENT

Summary

"Cryptocurrency can have a long-term commitment, especially when this innovative technology promotes a faster, safer, and effective payment system." ***— Federal Reserve Chairman, Ben Bernanke***

"Blockchain is technology. Bitcoin is only the first mainstream embodiment of its potential." ***— Bitcoin Chaser founder, Marc Kenigsberg***

Energy is the foundation and driving force for the progress of human civilization. It is related to the national economy, people's livelihood and national security, and the survival and development of mankind. It is essential for promoting economic and social development and enhancing people's well-being. After nearly 40 years of development, energy is the most important commodity in the world. Its trade has evolved from the beginning of the physical transaction form, and finally a corresponding complex financial market was born in this industry.

Until the emergence of new energy lithium batteries, major breakthroughs have been made in all technologies. Lithium batteries have the advantages of high voltage, high specific energy, long cycle life, environmental friendliness, and good energy density and power density. It is one of the best current comprehensive performance power batteries that have been widely used in electronic consumer fields such as mobile phones and notebooks, rail transit, new energy vehicles and other power fields, small energy storage power supplies, uninterruptible power supplies (UPS), communication base station energy storage, new energy storage, energy storage field and etc.

With its rapid development, the shortcomings of the industry are also obvious. The operation of many new energy projects lacks funds, project operations cannot obtain the return they deserve, investors cannot invest their own funds into valuable anchored new energy projects, and huge asset investment often raises the issue of corporate capital flow management challenge. With the access to diversified forms of mass distributed energy, microgrid, energy storage, and new energy vehicles in the energy Internet, the centralized operation mode of traditional energy networks will face high communication pressure, high computing costs, poor fault tolerance, and single point difficulties such as failure, these problems are bothering the healthy development of the industry.

NEI (NEI Group) new energy industry token came into being, based on the principle of blockchain technology innovation and the global big data system, to build a shared platform that helps new energy investors and project operators around the world. NEI is an intelligent peer-to-peer network and a decentralized peer-to-peer network that recognizes, disseminates, and records information presented by a unique blockchain decentralized technology in the field of new energy technology. The combination of cryptography principles, time series data, and consensus mechanism to ensure the continuity of each node in a distributed database is that information can be verified instantly, traceable, but difficult to tamper with and cannot be shielded.

Thus, creating a set of privacy, efficiency, and features of a secure shared value system.

The New Energy Industry (NEI) team hopes to realize the storage, verification, transmission and exchange of network data through its own distributed nodes of blockchain technology, effectively solving the problem of data sharing in the new energy field, promoting problems caused by insufficient credit, and integrating resources in the energy industry, enhance the value of scientific and technological data and maximize the value of participants in the chain. By allowing global investors to use NEI digital assets to invest funds into the new energy industry, the new energy industry can develop, and will also drive the value of digital assets NEI.

1.0 Background Introduction to the Blockchain New Energy Industry

1.1 Global Energy Industry Development

With the access to diversified forms of mass distributed energy, microgrid, energy storage, and new energy vehicles in the energy Internet, the centralized operation mode of traditional energy networks will face high communication pressure, high computing costs, poor fault tolerance, and single point problems such as failure. Due to the advantages of centralization, transparency and automation, blockchain technology has made the energy academia and industry regard it as the new frontier of technological innovation. However, it still has certain shortcomings in terms of business model, sustainability of innovation entities, technical bottleneck resolution and industry supervision. Besides, with the active participation and promotion of many innovative entities, the number of industrial case practices, innovative technological solutions, the amount of participating innovation entities, and the number of scientific research projects is increasing, which is bound to bring the innovation and development of the energy industry to a better tomorrow.

Changes in the energy sector have great significance to the development of the country's economy and society. It has now become a key issue of global concern. Many countries are committed to the development of the new energy sector and the promotion of technological innovation, and continue to create a new integration of power grids and communications infrastructure, seeking to achieve energy transformation through the Energy Internet. With the rise of technologies such as blockchain, big data, cloud computing, and artificial intelligence (AI) in the Internet, innovation in the energy industry is also developing in the direction of intelligent management, optimized control and etc. At the same time, the integration and penetration effect of information and communication technology has become more obvious.

Blockchain technology has a high consistency with the Internet of Energy. Smart contracts provide intelligent rules for the interaction of the blockchain among various subjects, thereby giving consumers a high degree of autonomy in purchasing and selling energy. The natural decentralized nature of the blockchain can support a

decentralized energy supply system and help simplify multi-layer systems. Among them, power producers, distribution system operators, transmission system operators and suppliers directly connect producers and consumers at all levels through blockchain networks to conduct transactions, thus shortening the energy trade cycle and creating a multi-party collaboration network. The non-tamperable feature of the blockchain effectively integrates energy production, distribution, consumption, transaction and management and other links, therefore significantly reducing power transaction costs and improving transaction efficiency.

The potential advantages of blockchain technology in the energy industry have caused the energy industry to pay more and more attention to blockchain, and the scale of investment will increase accordingly. Among them, the most anticipated is the lithium battery industry. In recent years, the output of lithium battery industrial products has shown a rapid growth trend, and with the rapid growth of the new energy vehicle market, power batteries have gradually become the main application direction of lithium-ion batteries. In addition, attention to the new energy industry and the lithium-ion battery industry has continued to increase, and new requirements have been put forward for technological breakthroughs in lithium-ion batteries with highly safety, long life, and high energy density.

1.2 The History and Current Situation of the New Energy Industry

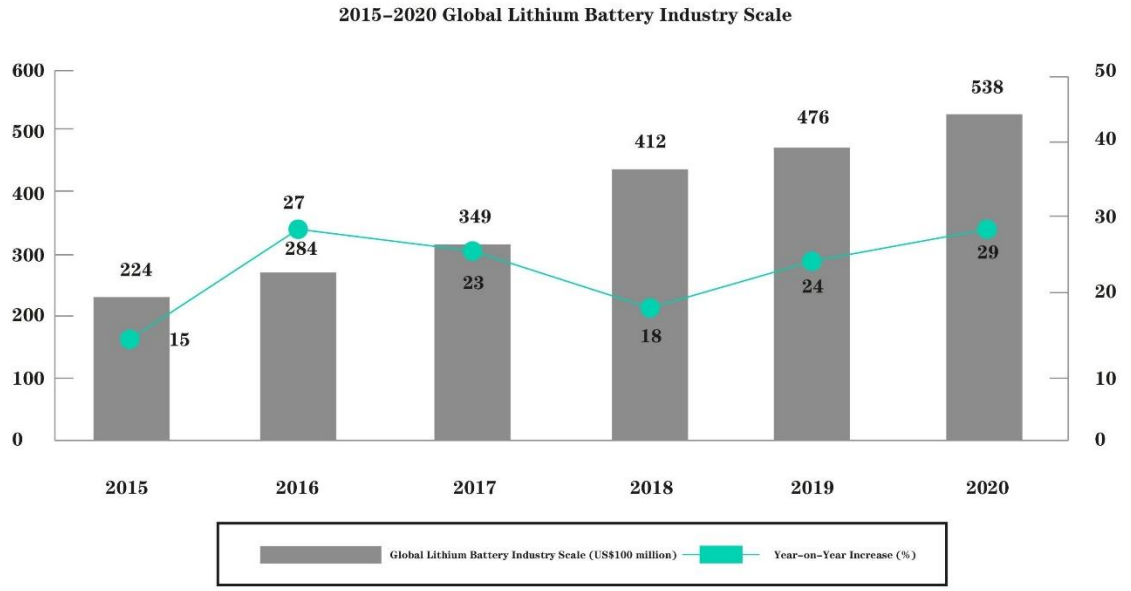

Figure 1.1: Scale of the Global Lithium Battery Industry

The global lithium battery industry is driven by the fast-growing new energy vehicle market and has developed rapidly in recent years. The production of lithium batteries is inseparable from the development of lithium resources. At present, the global lithium mining resources are abundant. From the perspective of lithium mining output over the years, from 2018 to 2020, the global lithium mining output has taken a big leap. Driven by the rapid growth of the global electric vehicle market, global lithium-ion batteries continue to maintain a rapid growth momentum. In 2018, the scale of the global lithium-ion battery industry exceeded US$40 billion for the first time, reaching US$41.2 billion, a year-on-year increase of 18.05%, and the growth rate dropped slightly by about 5% from 2017. According to preliminary calculations, the scale of the global lithium-ion battery industry will reach approximately US$60 billion in 2021.

Due to the gradual rise of environmental protection awareness in recent years and the gradual abandonment of high-polluting traditional fuel vehicles, consumers pay more attention to green vehicles and zero-emission travel, hoping to reduce carbon emissions and air pollution through new energy vehicles. The NEI team believes that by 2025, sales of new energy vehicles are expected to approach the level of 5 million units/year. The rise of environmental awareness, strong government subsidies and stringent emission policies will provide strong support for the sustainable development of new energy products.

Against the background of the overall global automotive market downturn, new energy vehicles represented by pure electric and plug-in hybrids are important for next-generation technology iterations, and their sales performance is very eye-catching. In the future, they are expected to became the main driver of sales growth gradually by replacing traditional power and become a promotion for passenger vehicles. At present, the global new energy market is still in the early stage of development, and the scale is still to be further increased. The growth and development potential of the overall industrial chain is huge. Investment in the development of new energy industries will be more and more important and has been included in the development strategies of many countries.

At present, a new round of technological revolution and industrial transformation are accelerating. New technologies, new applications, and new business formats such as artificial intelligence (AI), big data, and Internet of Things are in the ascendant. The Internet has ushered in stronger development momentum and broader development space. In the face of opportunities and challenges, the world's Internet development has continuously made major breakthroughs in digital economy, technological innovation, and network benefits. NEI believes that vigorously promoting new energy to the international stage will bring new energy to a new level.

1.3 New Energy Industry (NEI) Industry Chain

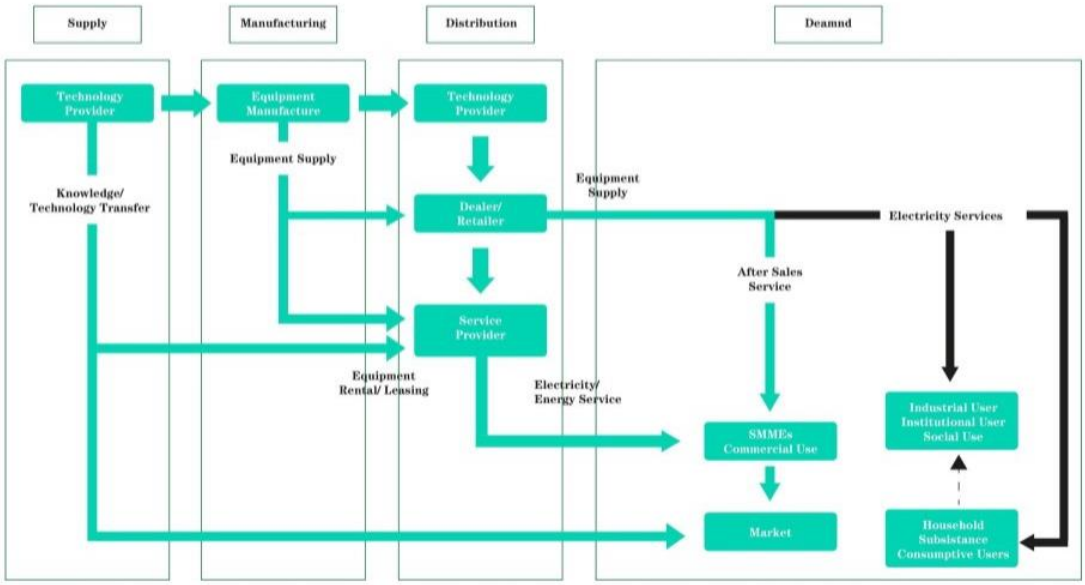

Figure 1.2: New Energy Industry (NEI) Industry Chain

The new energy industry (NEI) industry chain can be divided into upstream, midstream and downstream:

1. Upstream of the Industrial Chain: R&D, Collection and Development of New Energy Industry

Distributed energy is usually located at the user's location and connected to the power generation facilities of the regional power system, it includes lithium resources, thermal power generation systems, industrial energy recovery and utilization systems, and has a demand-side management function. Distributed energy has been successfully commercialized and is the most efficient way of utilization. Energy efficiency can reach more than 80%, transmission and distribution losses are significantly reduced, which can effectively reduce the probability of grid collapse and improve power supply reliability. Distributed energy technologies mainly include micro gas turbines, industrial gas turbines, hotspot co-generation systems, photovoltaics, wind power systems, lithium batteries, etc. Among them, the power generation efficiency of fuel cells may reach 80%, which is the most valuable technology for future development.

These technologies will be integrated with intelligent control optimization technology and integrated system optimization technology to become the core technology of the energy Internet. Research and development of lithium battery technology, strive to break through the technical bottlenecks of high-safety, long-life, high-energy density lithium-ion batteries in the field of power batteries, and breakthrough high-capacity positive and negative materials, high-safety diaphragms

and functional electrolyte technologies in key materials . It is expected that in 2025, new energy lithium batteries will be independently developed and applied, and system integration capabilities will be greatly improved. Distributed power generation market transactions need to follow the basic principles of information equivalence, sharing, transparency, and transaction decentralization. The blockchain technology itself is a special database structure, because it has the characteristics of decentralization and decentralization, it will be very effective in distributed power generation market transactions.

2. Midstream of the Industry Chain: New Energy Industry Trading Platform

The goal of applying blockchain technology in the new energy industry is to provide a completely decentralized energy system where energy can be directly communicated between producers and consumers. Blockchain technology helps to strengthen the market influence of individual consumers and producers, which also enables consumers to directly have a high degree of autonomy in purchasing and selling energy. Blockchain technology has shown strong application prospects in the energy field. In addition to performing energy supply transactions, blockchain technology can also provide the basis for metering, billing and settlement processes.

Blockchain technology and the concept of energy Internet have strong internal consistency, and smart contracts can realize unmanned intelligent energy Internet. Essentially, both the Energy Internet and the blockchain technology must be built on top of the universal smart device Internet of Things. The universal intelligence and Internetization of devices will be mutually exclusive with the development of the Energy Internet. The blockchain technology also emphasizes the interconnection and intelligence of the value network participants. The smart contract based on the blockchain is not just as it is literally shown, but also can achieve the function of physical or digital asset exchange. In fact, the real function of the smart contract is based on the non-tamperable and collective consensus features of the blockchain. The pre-written code can directly call the data on the blockchain and perform all the logical functions that its output can be calculated without human intervention or few human interventions and execute the results. Therefore, the true meaning of the smart contract is to provide intelligent rules for the interaction of the blockchain between the subjects, and can realize various complex logic functions without any participation. This feature is called Turing completeness. From this perspective, if the smart device network of the Internet of Energy is to achieve complete unmanned intelligence, it cannot be done without the help of blockchain technology, especially the smart contract technology deployed on the blockchain.

3. Downstream of the Industrial Chain: Terminal, Commercial, Industrial Users, Sales and Maintenance

On the perspective of the world, there is still a long way to go in using more efficient energy production and consumption methods. These alternative solutions include, but are not limited to, renewable energy and demand response utility projects, where energy is directed along the grid based on the unique needs and time of use of the household. So far, due to the electricity supply is always delivered to all recipients,

traditional grids have wasted 61% to 81% of energy. These wastes are worth a trillion dollars. The energy is used to pay bills and consumption, but is not used. It is also in the interests of individuals to create more and more efficient energy consumption methods that are determined according to needs. One of the ways to establish a smarter consumption system is through the digitalization of energy assets and decentralized transactions.

Digitizing energy assets to make it easier to exchange between suppliers and customers and through customer-to-customer networks may also encourage the use of renewable energy. Since renewable energy must be stored, but the benefits are declining, the ability of producers and consumers to trade based on changes in supply and demand will exceed the viability of non-traditional energy. In addition, even unsustainable energy can be used as a measurable asset for asset digitization and trading. The premise of these possibilities is the digitization of the energy itself so that it can become a tradable commodity with a certain unit value.

1.4 Analysis of Pain Points in the Traditional New Energy Industry

New energy industry generally refers to renewable energy developed and utilized on the basis of new technologies, including solar energy, biomass energy, wind energy, geothermal energy, lithium batteries, and the thermal cycle between the ocean surface and the deep layer, etc.; In addition, there are also energy known as conventional energy that include hydrogen energy, biogas, alcohol, methanol, etc., and the widely used energy such as coal, oil, natural gas, and hydropower. With the finiteness of conventional energy sources and the increasingly prominent environmental problems, new energy with the characteristics of environmental protection and renewable energy has attracted more and more attention from various countries.

With the adjustment of the industrial structure of various countries and the increasingly strict energy demand, the low-carbon economic development model will gradually replace the traditional high-polluting development model. The new energy industry will stimulate national economic growth, optimize industrial structure and make breakthroughs in the future. Due to the high R&D costs required for the development of the new energy industry that required with certain scientific and technological content, the transformation from experiment to actual production will face many constraints.

1. New Energy Management Model Issues:

In some specific links of the power battery industry, cross-industry and cross-field collaboration is very urgent. Take the echelon utilization of power batteries as an example. The echelon utilization involves multiple fields and industries, these including from the production of power batteries to the use of new energy vehicles, to electric power, energy storage, electric bicycles, automobiles and other fields, and finally to material recycling. Therefore, power battery recycling requires cooperation between

related industries and fields. With the increasingly diversified energy supply side, the traditional new energy management model has been unable to support the large-scale and systematic construction of new energy.

2. The Issue of Synergy between Upstream and Downstream Enterprises in the New Energy Industry:

Distributed new energy's preliminary planning, design, construction, operation, grid connection, transaction, subsidy and other links are scattered in the information system of each department. The authenticity of the source data is not guaranteed, the degree of data information sharing is not high, and the coordination efficiency of each link low.

3. New Energy Dispatch and Consumption Issues:

The information mismatch between the new energy supply side and the consumer side will affect the improvement of the level of new energy consumption, and building a multi-stakeholder information sharing mechanism has become the key to solve the problem.

4. The Impact of Economic Development on the Global Climate:

With the increasing demand for renewable energy caused by the global population growth, especially among the automobile industry which the demand continues to show exponential growth, the old traditional fuel vehicles currently pollute the world the most. The NEI team hopes to reduce carbon emissions through new energy vehicles and air pollution.

2.0 Design Concept of New Energy Industry Token

2.1 New Energy Industry Value Ecosystem based on IPFS Interplanetary File System Technology

NEI consists of two parts, NEI decentralized and distributed energy system and NEI new energy industry chain. The decentralized new energy industry system is used to carry energy data and can be shared safely and privately. The NEI new energy industry chain is used to carry the circulation of assets and the execution of rules. The clearing and settlement system allows assets to have high liquidity while ensuring high availability.

Through this structure, NEI can achieve a completely decentralized operation. Next, the characteristics or principles of each part will be introduced separately.

(1) IPFS Decentralized Distributed New Energy Industry System

NEI has developed a set of IPFS decentralized distributed new energy Industry system. The Inter Planetary File System is a distributed network, point-to-point hypermedia protocol which can make our Internet and data transmission faster, more secure, and more open.

NEI integrates the main chain network access, side chain nodes and cross-chain consensus technology to achieve fast and efficient full chain design. IPFS mining mechanism, POW (Proof of Work), Capacity of Work, and NEI block packaging on a safe and stable basis no longer be the main goal of mining. The main goal of mining is to reduce a large number of meaningless transactions by packing blocks for free, avoiding the consumption of a large amount of resources by miners, and objectively improving the transaction throughput of the system. Build a permanent storage mechanism for Internet data, allowing commercial organizations to more conveniently conduct self-operated business based on NEI, implement value interconnection, application circulation strategies, and build a new economic ecosystem for blockchain applications.

(i) New Energy Industry Asymmetric Encryption IPFS Technology

Due to the protection of the encryption algorithm, the address has the characteristics of not tampering and deleting (in a sense, if the password is cracked, it may be tampered or deleted, but the probability is extremely low), so once the data is stored in IPFS, the data will be permanent storage and it can effectively avoid the problem of inaccessibility after data deletion. Even if the site is revoked, the network of data stored in the site still exists, and the data can be accessed normally. The more distributed networks of storage sites, the stronger the reliability.

(ii) Confidentiality and Information Sharing

In asymmetric encryption, the private transmission of information can be realized through public key encryption and corresponding private key decryption. The private key makes a digital signature, and the corresponding public key verification can realize self-certified identity. Each communicating party needs two keys, a public key and a private key, which can encrypt and decrypt each other. If the data is encrypted with a public key, only the corresponding private key can be used for decryption; if the data is encrypted with a private key, only the corresponding public key can be used for decryption. Because encryption and decryption use two different keys, this algorithm is called an asymmetric encryption algorithm. The basic process of asymmetric encryption algorithm to achieve confidential information exchange is: Party A generates a pair of keys and discloses one of them as a public key to other parties; Party B who has obtained the public key uses the key to encrypt the confidential information then send it to Party A; Party A then uses another private key saved by itself to decrypt the encrypted information. The public key is public and does not need to be kept secret, while the private key is held by the individual and must be kept properly and kept secret.

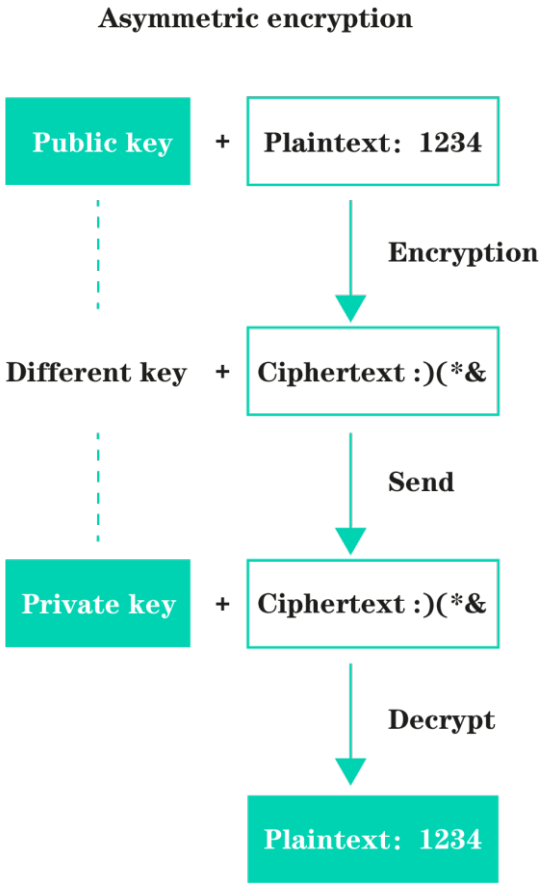

Figure 2.1: Asymmetrically Encrypted Storage

In the basic data layer, NEI stores new energy-sensitive data in asymmetric encryption to ensure the privacy of sensitive data. Of course, decrypted data can be obtained with a private key authorized digital signature.

(iii) Strong Client Node

The NEI system will provide client programs. Light wallet users can connect to the network by connecting to the full version of the wallet, or directly call the API, but the premise is that the owner of the full version of the wallet had open the permission for the API, and the full version of the wallet will pass through the peer-to-peer network from other full version wallets where the node downloads and complete blockchain.

Dapp users can use the light wallet to manage installed Dapps. Dapp API and node API are also available for developers to call, which allows developers to use Node.js to quickly and easily create JavaScript Dapp.

(2) New Energy Industry Chain

(i) NEI Cross-Technology

The cross-technology adopted by NEI refers to the fusion application of the underlying blockchain technology and other new technologies (such as the Internet of Things, artificial intelligence, and cloud computing). Blockchain technology needs to be deeply integrated with the Internet of Things and artificial intelligence technology in order to maximize its application in the physical industry.

In the new energy industry transaction, the use of the Internet of Things technology to track, locate and collect information, together with the capital flow and information flow, to form true and complete asset information is the prerequisite for the circulation of digital assets. Use artificial intelligence technology to deeply explore the value of data and bring digital dividends to the industry. The technological openness of the blockchain ecology can not only increase the flexibility and ease of use of applications/products, but also break through the original data and value islands, and promote the circulation of value, thereby expanding the boundaries of the blockchain ecology and gaining greater network effects.

(ii) NEI Distributed Storage

The news-oriented NEI on data breaches in the past few years showed that the frequency of such breaches increased by as much as 10 times between 2009 and 2019. In order to effectively prevent the risk of data leakage, NEI adopts a distributed storage method to protect the data transmission process, making data leakage more complicated than the current data center methods. In the NEI platform, a distributed storage network (DSN) concept is introduced.

The data network aggregated storage provided by multiple independent storage providers and self-coordinates provides data storage and data retrieval services to clients. Based on blockchain technology, all data will be fragmented before being sent to the tenant of the hard drive space (or user), and each fragment will be sent to a separate node. Even if someone has the key, it is already difficult to find all the pieces. Redundant fragments are created by a process called Reed-Solomon erasure coding. Even if a few fragments disappear, files can still be retrieved and new fragments can be redistributed.

At the same time, due to our 5G technology optimization, this also makes the download and storage speed of NEI at least 10 times faster than normal speed.

(iii) The Assistance of Intelligent AI

The new energy industry chain will generate a large amount of data and use artificial intelligence analysis to discover possible system failures, predict failures, identify performance bottlenecks, and adjust the performance of the new energy industry chain system. There are four different levels of data analysis, including: descriptive analysis, diagnostic analysis, predictive analysis and prescriptive analysis. At the same time, the descriptive analysis of smart log data helps to monitor the real-time performance of the blockchain system and identify possible failures. In addition to diagnostic analysis of new energy industry chain data, predictive analysis is also necessary to predict the performance bottleneck of the new energy industry chain system. Different from diagnostic analysis and predictive analysis, prescriptive analysis can simulate and optimize the new energy industry chain system, thereby improving the reliability of the new energy industry chain system.

2.2 Mission, Vision and Values of New Energy Industry Token

Prospects for New Energy Industry Blockchain Projects

(1) New energy industry is gradually developing towards distributed development. The Internet of Energy advocated today will change the development, transportation, storage, and financial transactions of the energy industry. With the demand for lithium mining energy and the transformation of lithium mining energy production models, the direction of lithium mining energy production is likely to gradually shift from centralized production. The model changed to a distributed production model. It is foreseeable that in the future, there will be a transition from a single centralized large-scale power supply to a mode in which centralized lithium power supplies and distributed power supplies exist in harmony. The power generation end of lithium mining will gradually develop towards distributed development, and the topology of the power grid will also change with the distribution of the power generation end.

(2) Consumers will become value promoters of the industry chain. Energy consumption will be the most important part in the energy Internet. Consumers will not only be consumers in the era of energy Internet, but will appear in a new form, both as producers and consumers. With the popularization of distributed power grids, consumers will have greater autonomy in purchasing energy services, and will prefer energy services with high flexibility and good economy. User energy trusteeship and energy efficiency trusteeship may become a new profit model. Consumers can actively participate in community demand-side response projects through demand-side response plans. They can also join virtual power plant projects as virtual power plant members. At the same time, they can resell lithium batteries to the grid through new energy vehicles and lithium energy storage facilities. The value of consumers in the industry chain will become greater and greater, and they will become value promoters of the industry chain.

(3) Combining artificial intelligence, Internet of Things and other technologies to jointly develop electric power, and through the application of emerging technologies to the lithium battery industry is the future development trend. Blockchain technology can work with artificial intelligence and Internet of Things technologies. With the development of the Internet of Things, hundreds of millions of assets and data information need to be recorded and traded online. Energy and power companies can obtain customer energy consumption data in real time through the blockchain Internet of Things, and on this basis use big data and cloud computing to analyze and predict customer energy demand, and provide customers with energy efficiency management services. Through a decentralized, autonomous and efficient system to record equipment ownership and operating status, automatically read smart meters, and use artificial intelligence technology to predict energy demand, it can make future energy consumption smarter. Realize real-time connection and real-time interaction with customers through intelligent hardware, explore the needs of customers in a variety of work and life scenarios, and grasp the business opportunities of consumption upgrades.

2.3 Technical Features

NEI is a blockchain asset platform that promotes global energy to promote energy-saving, environmentally friendly and energy-efficient blockchain projects. By using blockchain technology, NEI can provide safe, reliable and fast data exchange.

1. Develop a New Intelligent IoT Chip

New energy Industry implants or connects the smart IoT chips developed to mobile phones, home appliances, new energy vehicles and other energy-consuming terminals, so that the terminal devices become nodes (mining nodes, data nodes) of new energy industry. The node can synchronize the energy consumption data and energy saving data of the terminal equipment to the new energy industry data system. The node builder or end user can view the energy data of the terminal through the APP, and can use the data to exchange for NEI token.

The new energy industry team will develop its own unique IoT chip module (the module consumes almost negligible power), which can be implanted in commonly used power-consuming equipment, so that the device has the function of power compensation, and all energy consumption. The data is recorded into the new energy industry data system, and the compensation benefits are distributed to users through POEF incentives. In the process of using this daily equipment at home, users enjoy the energy consumption compensation brought by new energy industry at the same time, so that users can realize the existence and value of new energy industry, so as to join the new energy industry family and participate in the construction of new energy industry ecosystem and development.

2. Credit and Certification System

In order to create a complete credit environment and provide participants with a fairer, more impartial, and fraud-free credit experience, NEI proposed a credit evaluation system based on the block layer. Before the transaction occurs, you can check the credit status of the credit account. After the transaction is completed, participants can make a credit evaluation for the transaction. Once the evaluation is in the chain, it cannot be tampered with.

In the new energy industry certification system, different organizations or institutions will be granted different block-level public keys, and when the user is authorized, the digital signature of the user's private key can obtain the authentication data.

In order to facilitate the use of different environments and different users, NEI will provide client tools based on web, mobile, and PC. Users can use NEI's tools in their familiar environment.

Figure 2.2: NEI's Certification System

3. Smart IoT Support

The Internet of Things closely integrates the virtual economy and the real economy. The Internet of Things is an important means for the development of the real economy to the smart economy. Blockchain technology provides point-to-point direct interconnection for the Internet of Things for data transmission. The entire Internet of Things solution does not need to introduce a large data center for data synchronization and management control, including data collection, instruction sending, and software update operations. The blockchain network is used for transmission. Based on this, NEI integrates energy + Internet of Things + blockchain to provide integrated services and standards.

4. Quick Search

The transaction process in the traditional Internet involves the joint realization of supply, demand, and intermediary. By using blockchain technology, the “intermediary system” in traditional Internet transactions can be completely abandoned, and the supply and demand parties can be directly connected to achieve supply and demand based on optimal matching of requirements. Due to frequent matching processes between energy products and users in the new energy industry lightning transaction scenario, blockchain technology is a very ideal solution for realizing lightning transactions. In order to make the supply and demand more efficient, NEI will add AI technology to the blockchain to improve the efficiency and intelligence of matching. All energy products can be quickly connected to NEI's matching system to provide users with convenient matching services.

3.0 Economic Theory of New Energy Industry Token

3.1 Token Model

NEI (New Energy Industry)

NEI is the value token of the new energy industry system. All NEI system participants can participate in new energy industry development projects by holding NEI digital assets, make contributions to the vigorous development of new energy industry projects, and enjoy related rights and benefits.

In addition, the more NEI a user holds, the greater the proportion of their equity, that is, the revenue of the system is closely related to the amount of NEI cryptocurrency held by the user. NEI is about to realize the circulation in the new energy industry system. At this stage, once the new energy industry digital asset token is launched on the exchange, the withdrawal function can be activated immediately.

3.2 NEI Circulation Method

(i) NEI's Token Model

Based on the data support provided by the energy data system, the new energy industry transaction system incorporates new energy industry holders, new energy industry demanders, and NEI miners into the main body of the transaction system, and solves the cumbersome process, high cost, and low efficiency of the traditional transaction process through smart contracts and other issues.

Through the trading system, energy holders can quickly convert sellable energy into NEI. The energy demander obtains NEI from NEI miners or third-party agencies, and can quickly convert it into the required energy in the trading system through NEI.

NEI miners assume the responsibility for the construction of the new energy industry network to ensure the normal operation of the entire system and promote the development of the NEI node network. Part of the transaction fees generated during the transaction will be used to motivate NEI miners.

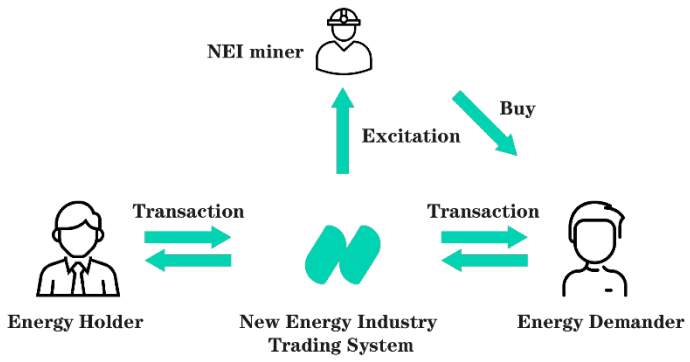

Figure 3.1: New Energy Industry Trading System

(ii) NEI's Token Circulation Mechanism

The NEI platform has a new energy industry service provider qualification certification system. In order to ensure the value of the energy submitted by the NEI platform, the regulatory agency must be certified by the NEI team. If it is a relevant science and technology institution, it is also necessary to confirm whether it has passed the qualification certification. The energy consumption data of certified energy industry service providers also naturally have higher value.

NEI adopts a hybrid certification system, which combines a centralized certification method directly certified by a trusted authority and a P2P decentralized certification method certified by the NEI team. In order to improve the credibility of P2P certification, the certifier needs to pay a certain NEI as a deposit and registration fee when participating in the certification. The user who completes the task will get a partial return, otherwise a part of the deposit will be frozen as a fine.

- Authentication and accessibility of public keys are owned by authoritative institutions and organizations to ensure the credibility of data and the privacy of sensitive data.
- Individuals can view their own data with the private key, and they have no right to write. Certified assets can be certified and verified under authorization.

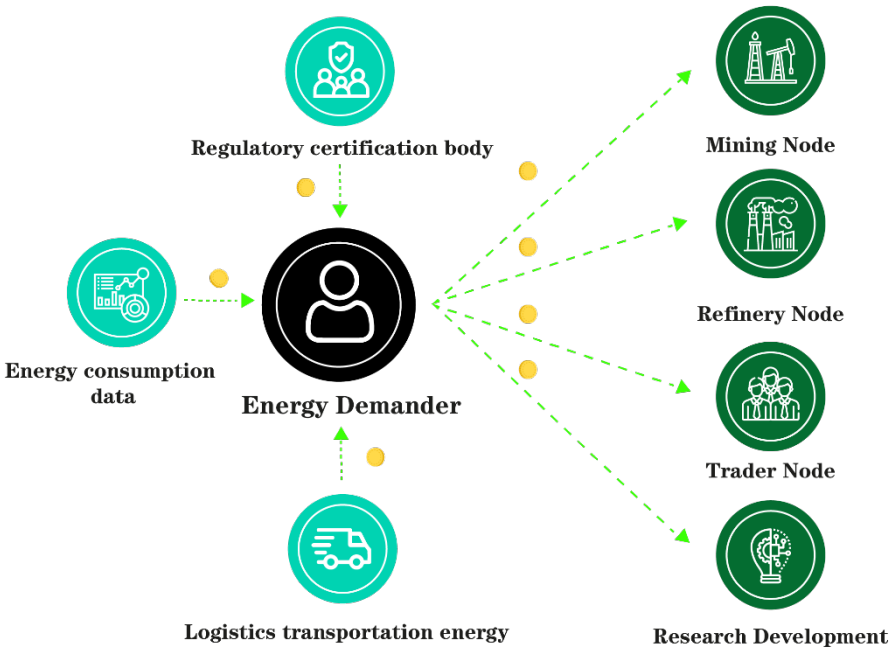

Figure 3.2: NEI's Token Circulation Mechanism

(iii) Distribution Channels of NEI

According to the energy blockchain application scenario screening model, the data application scenarios and transaction application scenarios of energy companies are filtered, and the following two scenarios with the best adaptability of the energy blockchain can be obtained:

- **Trusted Collaboration on Energy Data**

First, the availability of the data is judged according to the judgment criteria in the availability judgment stage, energy companies have network infrastructure and data storage infrastructure to meet scene availability. Secondly, to judge the efficiency, according to the criterion of the efficiency judgment stage, it also has high social value, authentic, and satisfies the principle of efficiency. Finally, the best fit is judged. Because energy data has privacy and non-disclosure, its requirements for a trusted environment are very high, and the value of energy data can provide incentives to the parties participating in the collaboration and satisfy the requirement of best fit.

- **Green energy trading ecosystem**

First of all, the availability is judged. According to the judgment criteria of availability, the blockchain application areas that green energy transactions such as carbon trading and green energy transactions are allowed to develop, and energy companies have network infrastructure and data storage infrastructure to meet scene availability. Most energy companies currently have a small green energy transaction scale, and their metering equipment and transaction records are well stored, with obvious digital features. The transaction involves multiple parties, and the transaction information needs to be authentic and traceable, has the need for information authenticity, and meets the principle of efficiency.

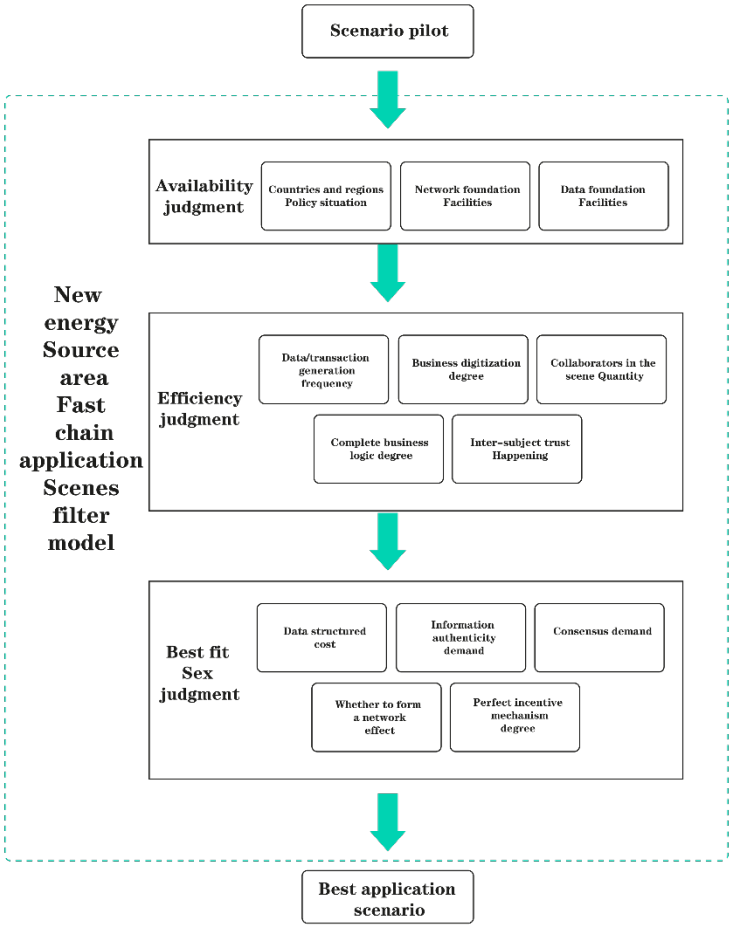

Figure 3.3: Application Scenario Screening Model of Energy Blockchain

4.0 User Rights Redistribution Model

4.1 NEI Allocation Mechanism

The total amount of NEI's ecological rights is 100 million.

The NEI team and the ecological construction part will enter a closed period of 3 days. After the expiration of the period, it will be released in accordance with the contract, and the NEI obtained by mining can be freely traded. NEI adopts the model of never adding issuance, and will be issued in a way that all is released after the closed period.

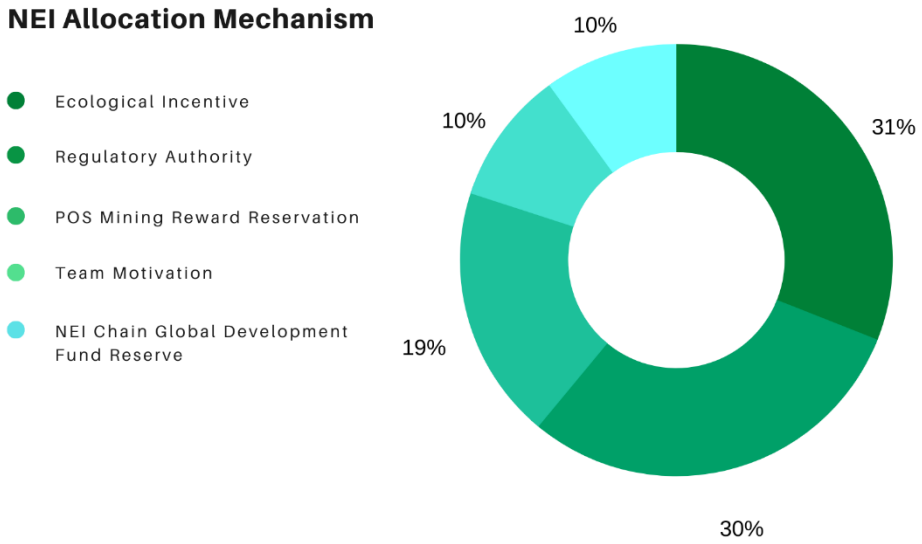

Figure 4.1: NEI Allocation Mechanism

Project	Percentage	Quantity	Closed Mechanism	Unlock Instructions
Ecological Incentive	31%	3100 million	Yes	NEI will take out 31% of the profits to be airdropped to community builders based on the contribution of community contributors. Incentive methods are gradually released to the community through investment mining and computing power mining models.

Regulatory Authority	30%	3000 million	Yes	5% will be unlocked before going online, and will be unlocked for 6 months, 15% will be unlocked in the seventh month, and 10% will be unlocked monthly.
POS Mining Reward Reservation	19%	1900 million	Yes	Reward miners who participate in mining.
Team Motivation	10%	1000 million	Yes	NEI will reserve 10% for team incentives. In order to ensure the stable and good development of the new energy industry system, the team needs to unlock the part of team incentives based on time and performance.
NEI Chain Global Development Fund Reserve	10%	1000 million	No	As the NEI Development Fund, this part will be used to invest in the research and development of blockchain technology in the field of new energy industry.

4.2 Consumption and Mining

NEI redistributes user rights through a multi-dimensional mining mechanism design. The essence of “mining” as we understand it is to gradually transfer the ownership of the system to the long-term feedback behavior of users.

According to the distribution method of rights and interests, once a user participates in a certain scenario and uses tokens for transactions or exchanges, then he can become one of the "shareholders" of the ecology. Its behavior will be defined as a mining action, providing benefits and contributing energy to the community as a whole. At the same time, transactions and participation behaviors are essentially a combination of blockchain technology and blockchain economic system, and become a quantifiable energy conversion process.

4.3 New Energy Industry System Users Pull New Mining Mechanisms

In the NEI system community, as long as one user can effectively promote the community evaluation, help other users form an independent thinking and participate in the decision-making system, and help other users understand the economic system of the NEI system, recommending new users to join the community is known as pull new mining.

Therefore, in order to stimulate the enthusiasm of users to pull new, eliminate the barriers and barriers of the blockchain, and develop the concept of autonomous organization in the future energy field of the new energy industry system, the new energy industry system has set up a new economic system of "pull new mining". Users are motivated in the form of making information contributions and obtaining rewards, rewarding all recommended behaviors, and as the ecosystem users expand, a multilateral value spiral model is constructed.

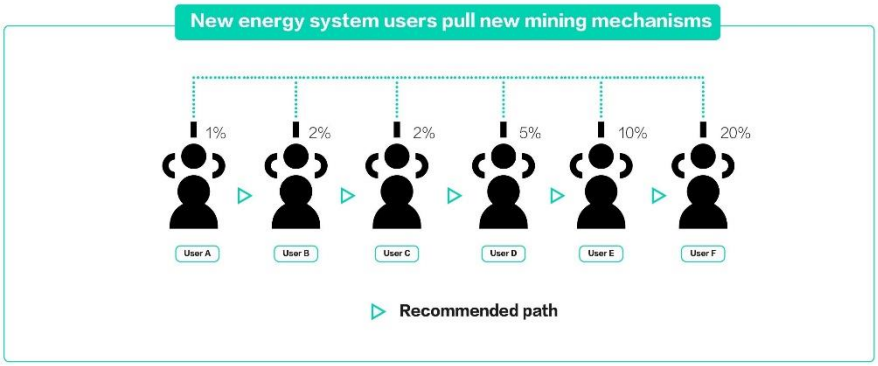

Figure 4.2: New Energy Industry System Users Pull New Mining Mechanisms

5.0 Technical Solution

5.1 Infrastructure Design

NEI intends to incorporate all business systems in the energy sector into the new energy industry chain for overall construction and management based on IPFS, and set up a private chain to connect to the grassroots.

IPFS is like a distributed storage network (similar to SIA). Any resources stored in the system, including text, pictures, sounds, videos, and website codes, will generate a unique address after hashing through IPFS. In the future, just use the address to open it and share the address.

5.2 Technical Architecture Design

(i) Protocol Layer: This layer represents the core content of the blockchain. It is the underlying technology that is generally called on the market. It contains the structure of data storage, consensus algorithm, encryption mechanism, network communication protocol and so on. All of this content is wrapped in this layer for operation, and the upper layer calls are provided in the form of APIs or services.

(ii) Extension Layer: The extension layer is more like the V layer in the traditional MVC architecture and handles part of the business logic. Smart contracts are built on this layer. Therefore, at this layer, NEI can extend blockchain technology to various scenarios through smart contracts, such as AI artificial intelligence, VR/AR, Internet of Things <IOT>, ERP/MES, big data <Bigdata>, the cloud platform <Cloud> can be implemented here.

(iii) Application Layer: The application layer is for end users. For those who have been exposed to digital assets, various "electronic wallets" belong to this layer. However, in practical applications, due to the limitations of blockchain technology itself. The development of the application layer must not only face the needs of users, but also take into account the logic and technical requirements of the extension layer and the protocol layer. This leads to a blockchain development project that will require more complex teamwork.

(iv) Resource Layer: Provide computing power and resource layer, provide computing power, storage space and bandwidth, and provide basic hardware facilities and virtualization services for the entire ecosystem.

(v) Component Layer: The component layer provides basic software capabilities based on blockchain technology, including aggregate payment, business volume engine, artificial intelligence module, blockchain-based digital identity authentication, distributed ledger and all of the alliance chain business software technology foundation.

(vi) Business Layer: By combining the capabilities provided by the component layer, complete specific business units in the ecosystem and provide various business capabilities including commodity management, logistics management, promotion, payment, and message push.

(vii) Client Service: Based on the above three tiers, launch direct-to-customer application services, including online mall systems, promotion alliance systems, micro mall systems, and supply chain management systems.

5.3 NEI Core Technology

5.3.1 Cross-chain Communication

Through the transaction flow across the entire system between the main chain, the data side chain (DSC) and the computing side chain (CSC), NEI can examine the communication protocol at a high level. Through innovative Blockchain Multi Tunnel (BMT) protocol, Hyper Exchange Axis, Indicator, smart contract and other blockchain technology achievements and innovations, NEI has realized the value interconnection between blockchains, laying a foundation for the realization of complex distributed commercial applications between the chains.

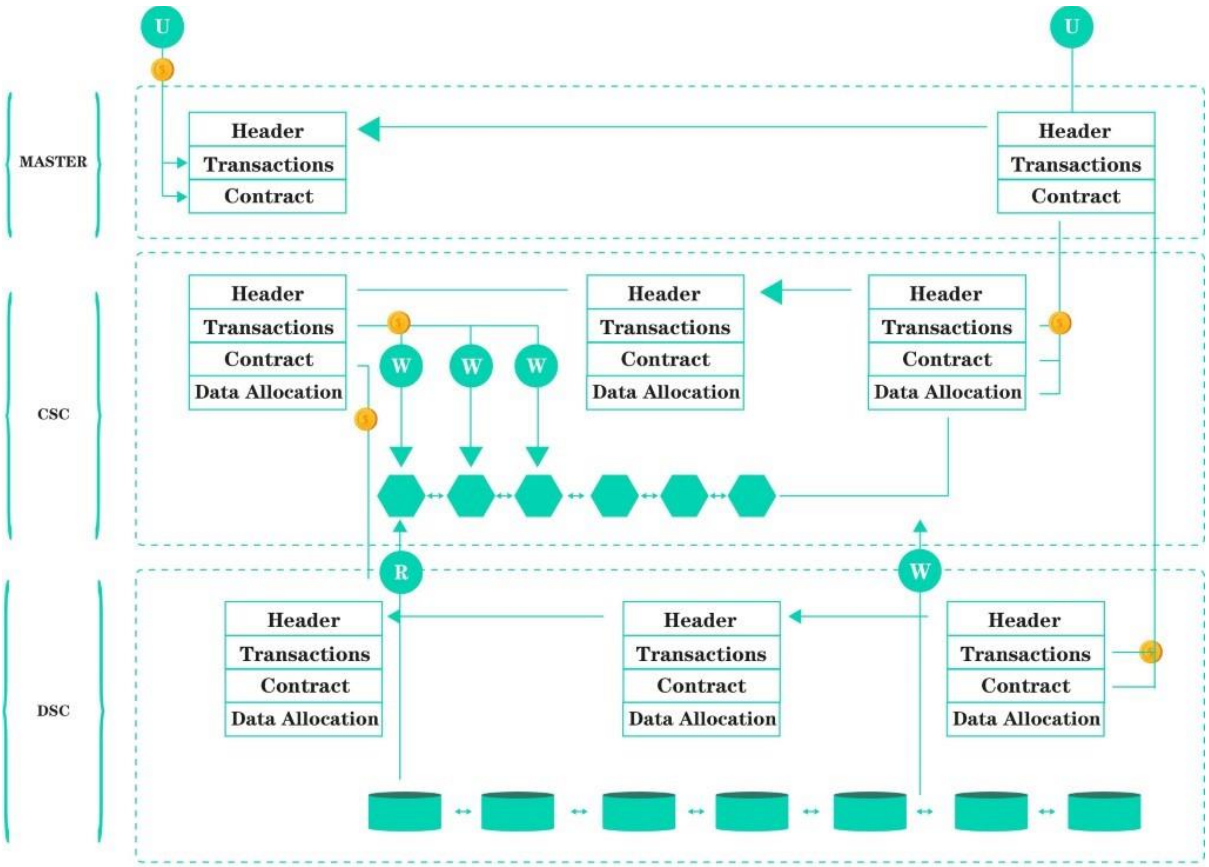

Figure 5.1: Transaction Process of Cross-chain Communication System

5.3.2 Calculating the Side Chain

In NEI, the computing side chain (CSC) has a structure similar to DSC, which is also linked by hash, and also includes block headers, transaction sets, NEI network contracts, and data distribution. The transaction still uses the “Merkle Tree” structure. The client sends a calculation request to the network, and this request is propagated through the network. Every miner uses a computational side chain (CSC) to obtain tasks. When a task is completed, the working miner sends a confirmation to the computing side chain (CSC) to update the task status and get rewards.

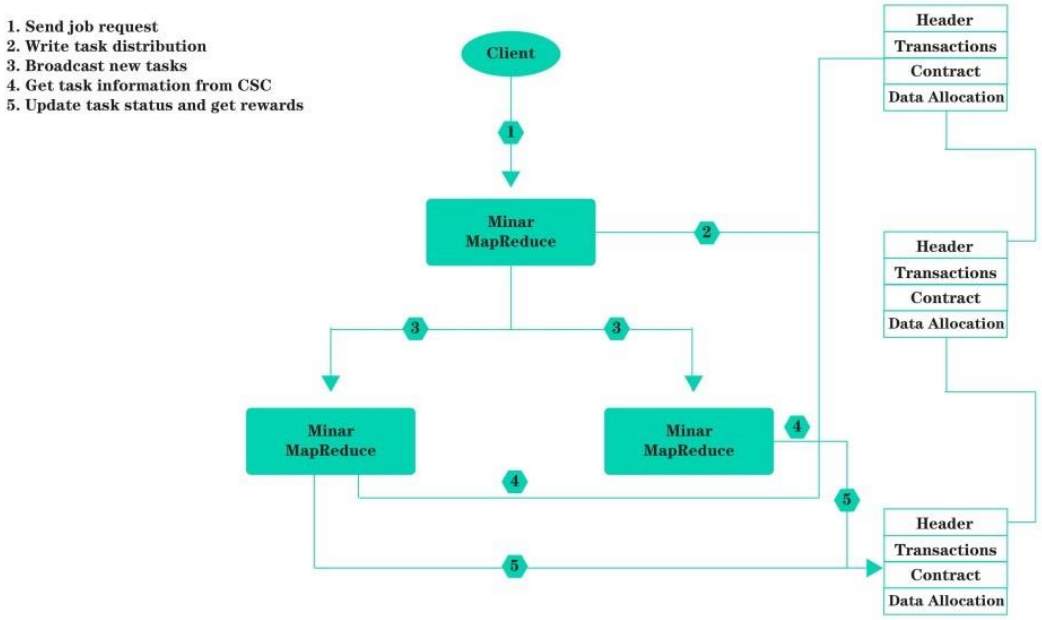

Figure 5.2: Calculation of the Transaction Process of the Side Chain System

The solver and verifier in the computing side chain (CSC) will load the code and data into the NEI virtual machine (DVM) and execute the code in the FE virtual machine (DVM). These codes include parallel computing tasks and verification tasks. Miners who calculate the side chain (CSC) need:

- Check the format of the block;
- Check the deduction, the deposit is valid;
- Check whether the data and codes related to the task are valid;
- If necessary, verify the task results;
- If necessary, read/write data from DSC;
- Summarize transactions and send them back to the main chain;

5.3.3 Data Holding Certification

In order to allow customers to store data on untrusted servers and verify whether the server stores their original data without retrieving the data, a proof of data ownership is introduced. This model provides the first provably-secure solution for remote data inspection.

The Provable Data Possession Scheme (PDP) is defined as a collection of four polynomial time algorithms (Key Gen, Tag Block, Gen Proof, Check Proof). Key Gen (1k) → (pk, sk) is run by the client, using a probabilistic key generation algorithm to establish the model. It takes a security parameter k as input and returns a pair of matching public key and secret key (pk, sk). TagBlock (pk,sk,m)→Tm This algorithm is run by the client to generate verification metadata. It takes a public key pk, a secret key sk and a block m as input, and returns verification metadata Tm. GenProof (pk, F, chal, ∑)→V is run by the server to generate a proof of ownership.

It needs a public key pk, an ordered set of blocks F, a challenge chal, and an ordered set of verification metadata ∑ corresponding to the blocks in F as input. For the block in F determined by challenge chal, it returns a proof of holding V. Check Proof (pk,sk,chal,V)→{'success','fail0'} is run by the client to verify the proof of possession. It needs a public key pk, a secret key sk, a challenge chal, and a proof of possession of V as input. For the block determined by chal, it returns the proof that V is correct.

5.3.4 Data Side Chain

The data side chain (DSC) is built on P2P storage networks, such as IPFS and Swarm. The data side chain itself serves as an incentive layer and is not used for data storage. The data side chain (DSC) has its own digital assets (data side chain), which can be transferred back to the main chain at a defined exchange rate. The data side chain (DSC) uses Proof of Spacetime (PoSt) as a consensus method for microtransactions. The data side chain (DSC) provides the foundation for the decentralized storage network.

In this case, the advantages of the data side chain (DSC) include faster time settings, lower transaction fees, faster transaction speed, higher privacy protection and the ability to maintain transparency. Data and files are broken down into many small pieces and stored in a P2P storage network, such as Inter Planetary File System (IPFS).

The metadata and hash of each small block are stored in the chain using a structure similar to Merkle Patricia Tree, which is called the file state. In addition to the hash value of each block and file itself, NEI also designed a cross-chain URI (Uniform Resource Identifier) for the file itself, so the data can be easily accessed through the network and the chain.

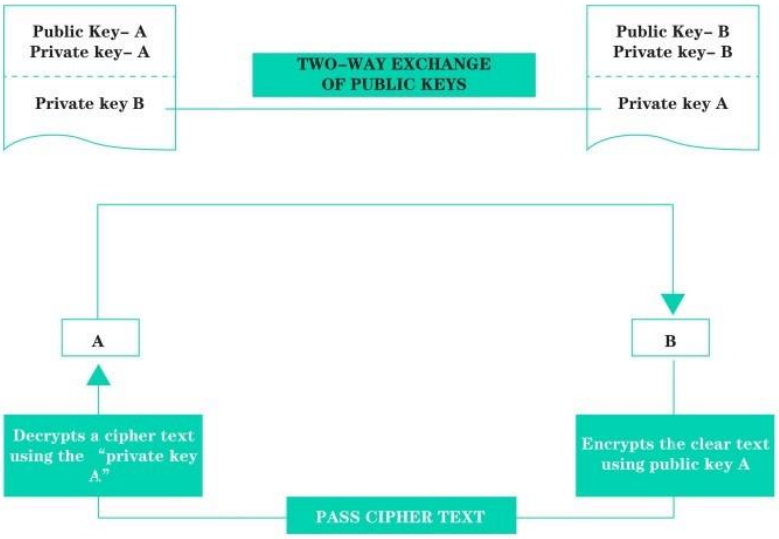

Figure 5.3: Calculation of the Transaction Process of the Side Chain System

Perry Keenan
Chief Executive Officer（CEO）

Based on his unique insights into the blockchain, Perry has a keen intuition that is comparable to that of others, which helps the NEI brand directly reach the terminal merchants. He graduated from Ecole Polytechnique in Paris and holds an MBA from Massachusetts Institute of Technology. Perry worked for Pernod Ricard for 8 years.

Christopher Farman
Chief Operating Officer (COO)

Chris is mainly responsible for company operations. Six years of work experience at Bain & Co. has given him outstanding talents in consulting and project management. In addition, he has also worked for Gdansk Radio and has excellent speaking skills and communicating. Chris graduated from the University of South Hampton in the United Kingdom with a bachelor’s degree in international business.

Sergio Andrés Perea Camacho
Chief Product Officer (CPO)

Sergio is mainly responsible for product sales and investor relations. Sergio worked for the online education platform iTutorgroup and the well-known commercial design company IDEO, and has extensive Internet digitalization and commercial design experience. Sergio graduated from Nottingham University.

Bruno Ariel Vignale
Chief Marketing Officer (CMO)

Bruno is a well-known computer engineer and mortgage consultant. Bruno has been providing vision and leadership to technical staff for more than 5 years. He is rich in leadership experience, unlimited passion and professional ethics. Besides, he is also a CDH certified administrator.

Muhammad Mustaqeem Essani
Chief Technical Officer (CTO)

Muhammad is responsible for products and technology, leading the company’s entire product research and development team. He has extensive experience in the enterprise management software industry. He has worked in SAP for 5 years and has served as the product development leader of SAP risk management and audit management solutions.

7.0 Legal Compliance and Disclaimer

Announcement on Preventing the Financing Risks of Cryptocurrency

The public should be highly vigilant against the hidden risks of cryptocurrency issuance financing and trading. There are multiple risks in cryptocurrency issuance financing and trading, including false asset risks, business failure risks, investment speculation risks, etc. Investors must bear the investment risks themselves.

Disclaimer

This white paper has clearly stipulated that the NEI team does not make any representations or guarantees (especially for their marketability and specific functions) for NEI new energy industry digital assets. Any investor participating in NEI digital assets is based on his own understanding of NEI new energy industry digital assets and the information in this white paper.

If you have any questions about the measures taken, please consult your legal, financial, tax or other professional advisors. New Energy Industry Digital Assets (NEI) does not intend to constitute securities offering in any jurisdiction. This white paper does not constitute any form of prospectus or offer document, nor is it intended to constitute securities offer or securities investment invitation in any jurisdiction.

Risk Statement

The NEI digital asset development and operation team believes that there are countless risks in the development, maintenance and operation of the NEI blockchain and digital assets, many of which are beyond the control of the NEI digital asset development and operation team. In addition to the other content described in this white paper, each NEI participant should carefully read, understand and carefully consider the following risks before deciding whether to participate in this public participation plan. It is deemed that participants have fully understood and agreed to accept the following risks: inadequate information provision, source code defects, cryptography, security weaknesses, "distributed denial of service" attacks, and insufficient processing capabilities.

Force Majeure

Due to force majeure conditions, activities related to NEI may be interrupted, suspended or delayed. In this white paper, force majeure refers to special events and circumstances that cannot be prevented, including natural actions, wars, armed conflicts, large-scale civil disturbances, industrial actions, epidemics, shutdowns, sabotages, long-term shortages of energy supplies or communication services or other failures, The actions of municipal, state, or federal government agencies and other circumstances beyond the control of the NEI team did not exist at the time of the publication of this white paper.

Representations and Warranties

New Energy Industry will not make or claim to make any statement, guarantee or promise to any entity or individual in any form, including any statement, guarantee or promise related to the authenticity, accuracy and completeness of any information in this white paper and hereby declare that it does not bear any responsibility.

No Recommendation Statement

Any information provided in this white paper about new energy industry, NEI digital assets, NEI digital asset initial sale and NEI wallet (see the white paper for all) should not be regarded as commercial, legal, financial or tax advice.

For advice on new energy industry and its business and operations, NEI digital assets, NEI digital asset initial sale and NEI wallet (see the white paper for all), please consult your legal, financial, tax or other professional advisers. You should understand that you may need to bear any financial risk of purchasing NEI digital assets for an unknown period of time.

Risk Management

Digital asset investment is a new investment model that involves multiple risks. Potential investors need to carefully evaluate investment risks and their own risk tolerance. The development of the blockchain needs to overcome the problems of speculation by holders, difficulty in market training and staff training, and time-consuming system migration. The development process may also be lower than expected. Blockchain technology has not yet undergone extensive financial testing, and there are potential safety and performance risks. The current legal system has not yet provided specific explanations for blockchain and decentralization mechanisms. In addition, this project also involves compliance legal risks, including:

Judicial Supervision Risk: Blockchain technology has become the main regulatory object of the regulatory agencies of major countries in the world. If the judiciary exerts influence, the development of the entire project of the Ripple Exchange may be restricted, causing the process to be blocked or even terminated.

Technical Risks: NEI is constructed based on cryptographic algorithms. The development of cryptography may also bring potential technical risks, and there may also be technical loopholes in the project development process.


New Energy Industry