ENERGY
ECO
CHAIN

# Energy Eco Chain

## Business Blueprint

Energy Eco Chain Foundation

# Summary

Energy Eco Chain is a distributed accounting and application development system for comprehensive energy systems and the green finance ecosystem. It is able to solve the current problems of inefficient use of resources during energy production, consumption, transmission, storage, and capital mediation, which arise in the process of revamping traditional energy systems into modern energy systems.

Powered by the digital currency of energy (via the digitization of energy production), Energy Eco Chain uses fundamental energy blockchains built from public, whole-internet collaborative blockchains to swiftly drive energy consumption as well as a digital energy economy system capable of sustained development and the motivation of compatibility. Energy Eco Chain will be built using a framework of many chains, and will be equipped with the benefits of both public and consortium blockchains, retaining the characteristics of public blockchains on the main blockchain framework while supporting the logic of consortium blockchains on secondary blockchains, hence realizing a "modularized plug- in".

The main applications of Energy Eco Chain are set to include energy supply chain financing, digital transactions of energy products, smart online payments and checkouts, etc. At the same time, there are also plans to expand into the areas of virtual free trade, financial insurance, and the building of Smart Cities and Smart Governance.

The main operator of Energy Eco Chain will be the Energy Eco Chain Foundation based in Singapore. The Foundation will collect the digital assets by crowd-sourcing for tokens (Energy Tokens, abbreviated as 'ET'). These will be used primarily for the research and development of Energy Eco Chain products and solutions, business development on the global market, reinvestment in blockchain

companies and projects, and the daily operations of the Foundation.

The Energy Eco Chain Foundation team consists of entrepreneurs, founders, and senior practitioners in industries that include energy, technology, media, and finance. Diverse backgrounds with a combined wealth of industry experience are what sets the Energy Eco Chain Foundation team apart and makes it an ideal partner for the provision of holistic service to clients and partners in the energy field.

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# 1. Values and Objectives

## 1.1 What is Energy Eco Chain?

Energy Eco Chain is a distributed accounting and application development system for comprehensive energy systems and the green finance ecosystem. It is able to solve the current problems of inefficient use of resources during energy production, consumption, transport, storage, and capital mediation, which arise in the process of revamping traditional energy systems into modern energy systems. Its core potential lies in the high efficiency, transparency, and safety due to being developed based on distributive databases. This makes it especially suitable for contemporary energy networks, which have a multitude of nodes, large data volumes, and a vast variety of types of data. Energy Eco Chain is able to mitigate issues arising from gaps in producer-consumer information in a distributive system (such as local demand-supply imbalances), therefore lowering barriers to entry and allowing more people to participate in the building of a green energy system.

Apart from this, various forms of digital currency modelled upon Bitcoin are unleashing a radical revolution in many industries. However, the lack of interconnectivity with an actual economic system has resulted in an enormous waste of calculation resources. These digital currencies, themselves, are also the source of much controversy. In contrast, Energy Eco Chain does not simply apply blockchains to energy systems. Instead, it further realizes innovation and completeness in the digital currency issuance and transmission framework. Therefore, yet another of our main objectives is to use energy tokens as our core to actively explore energy blockchain ecosystems that are based on crowdsourcing and open blockchains, and create a digital energy economic circle that motivates

compatibility in driving consumption and sustained development.

## 1.2 The goals of Energy Eco Chain

**Goal 1: Prosumption Synergy**

In the blueprint for a future where energy resources are highly decentralised and autonomous, the demand for division of labor will be an important feature of various energy nodes acting as prosumers. Meanwhile, a blockchain is essentially a decentralized consensus-building system. Therefore, Energy Eco Chain will be the key to resolving future bottlenecks in the energy industry. It aims to truly realize the reconciliation between production and consumption, increase the usage efficiency of energy, complete the merger of division of labor and cooperation, and therefore realize the goal of optimizing the energy supply chain.

**Goal 2: Exchange of Values**

In contrast with traditional information networks, the significance of blockchains lie in their completion of value production and transmission of precise records, which manifests in their traceability and resistance to tampering. Amid the ambitious goals of building an Energy Internet, these features enable the effective resolution of assignment and exchange issues in the energy production and consumption and transmission and storage processes. Besides that, energy itself can be a value-anchor due to its relatively stable value.

**Goal 3: Eco-currency**

Current electronic currencies have definite differences from digital currencies. The former is electronised traditional currency, whereas the latter is digital information made into a currency. Energy Eco Chain

digitizes energy output, which solves the issue of grey areas in digital currency standards by closely linking energy tokens with energy sources, thus endowing with a natural value storage function. It is not just a virtual digital asset, but also a historical record of the energy production and consumption behavior at a certain stage.

# 2. Technical Features and Value Models

## 2.1 Technical highlights of Energy Eco Chain

### 2.1.1 High-level applicability that satisfies the demands of the energy industry

With the development of a new generation of smart contract technologies, software applications and the entire business community have begun to adopt smart contracts. One example is Ethereum. There are already over 1000 third-party projects developing applications on the Ethereum blockchain. These applications cover a broad scope of genres such as food, social interaction, insurance, and gaming. However, the inadequacies of the Ethereum Virtual Machine (EVM) has caused inherent vulnerabilities in the latter during the setup of smart contracts, such as the inability to support floating points and complex mathematical computations, which makes it difficult to make engineering calculations; and the lack of standard library functions, which means that simple operations (such as the comparison of two strings) have to be carried out by manual code entry. These suggest a high "gas" cost. In some sense, Ethereum is, in practice, a "pseudo Turing machine".

The energy industry is different from other fields of application developing with blockchains. Its core applications (market transaction clearance, safety inspections, energy data analysis, etc.) are all related to large-scale modelling, optimization, and analysis and computing. At their current stage, there is no way these complex tasks can be completed on Ethereum. If the platforms were computer operating systems, Ethereum could be likened to the DOS system, and using Ethereum is akin to

reading and writing onto a hard disk on a DOS system. Meanwhile, the applications of the energy industry are equivalent to a kind of VR World of Warcraft"—impossible to run on a DOS system!

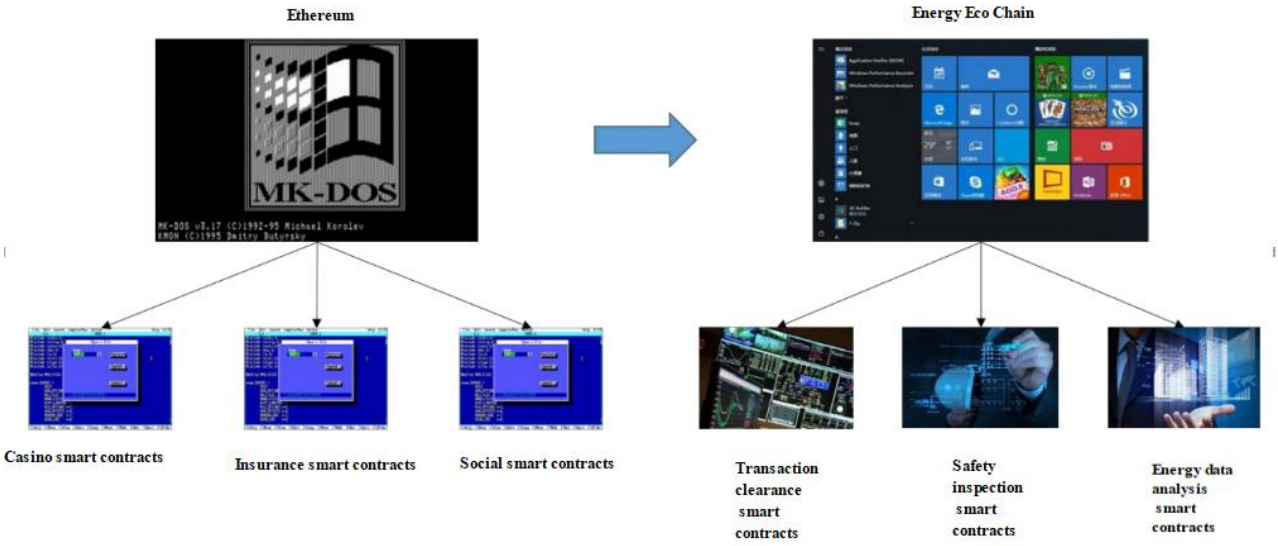


Diagram 1: From Ethereum to Energy Eco Chain—Changes in Quality

To create an ecosystem environment that meets the data storage and computing needs of the energy industry, Energy Eco Chain will:

- Be equipped with a more complete standard library that supports even more common functions, for added convenience in application development.

- Be able to realize mathematical optimization via processes such as linear programming and quadratic programming, thereby fulfilling the functional needs of mathematical optimization in applications such as energy market clearance and energy optimization.

- Set up a multi-chain parallel framework to support modular development

Energy Eco Chain will eventually allow developers to easily develop various energy applications on the blockchain platform, and ultimately realize the decentralization of the entire energy industry.

### 2.1.2 A multi-chain parallel framework

The blockchain is essentially a new generation of cloud computing service. On public blockchains, all the network nodes form a public cloud platform that provide a service to users; on consortium or private blockchains, one or multiple predetermined nodes form a private cloud platform. However, both technology roadmaps have their flaws. On public blockchains, computing and authentication needs to be executed jointly by tens of millions of nodes, which might lead to relatively coordination costs, resulting in low efficiency. In practice, many applications do not require combined authentication by all nodes on the network. Consortium and private blockchain services are limited in scope and they are less expandable, which makes them unable to be completely decentralized.

Energy Eco Chain will use a multi-chain parallel framework that features the advantages of both public and consortium blockchains to provide a set of reliable solutions. The unique characteristics of a public blockchain will be maintained on the main blockchain framework, but a secondary blockchain will support the logic of a consortium blockchain. On the main blockchain, the value token of Energy Eco Chain, the Energy Token (ET) will drive the entire Energy Eco Chain system and be used for reward and recognition, and for the payment of operation costs of applications on secondary blockchains, transaction service fees, and so on. At the same time, Energy Eco Chain will support “modular plug-ins” on secondary blockchains. The design of secondary blockchains will follow the following principles:

- The Energy Token will not only be able to be transmitted on Energy

Eco Chain, but also on other secondary blockchains. This will increase the Energy Token's scope of application and expand its potential for future application. Participation in computing and consensus on the secondary blockchain can be done using only the secondary blockchain nodes, which will increase operation efficiency and allow it to be attached to support high-level applications. At the same time, Energy Eco Chain will support applications developed by third parties, which will be negotiated with secondary blockchains and linked to the main Energy Echo Chain blockchain. This will further consolidate the status of Energy tokens.

- The operations and computations of secondary blockchains must be driven by the Energy Token. The Energy Token and the currency on secondary blockchains can be freely exchanged using a floating exchange rate system.

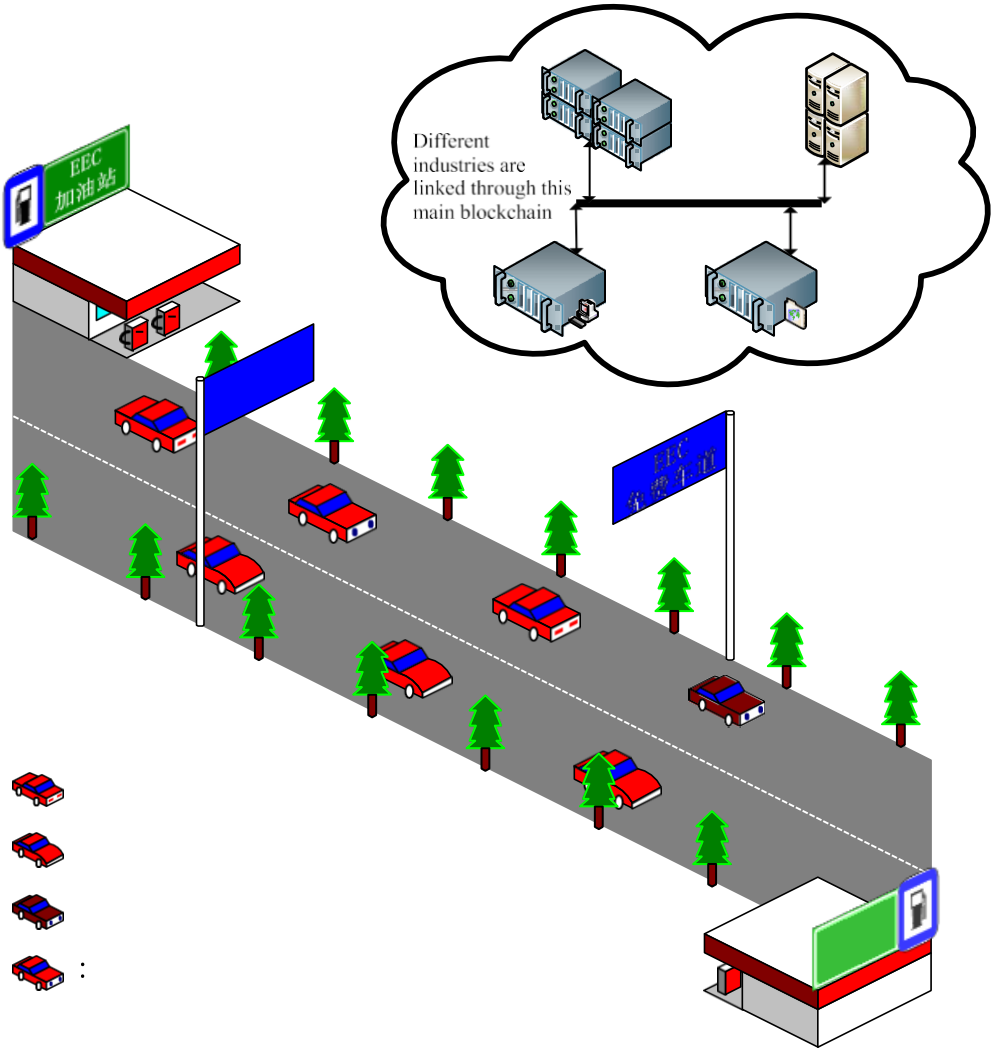


Diagram 2: Illustration of main blockchain logic

In the above diagram, the EEC toll-free lane stands for the Energy Eco Chain main blockchain. The cars on the road are the various secondary blockchains that symbolize different industries. The price for using the EEC toll-free lane is that the cars need to use the petrol in the EEC petrol kiosk, in other words, the secondary blockchains have to adhere to the side chain protocols and use the Energy Token. This will allow the Energy Token to circulate throughout the entire energy industry, realize industry decentralization, and increase the efficiency of the latter's information processing.

## 2.2 Energy Eco Chain – a value model

The economic value of the Energy Token will be supported by the following aspects:

- Participants conducting all kinds of transactions on the main blockchain will have to pay the authenticating party a certain amount of Energy Tokens. The Energy Tokens will not only be manifested as the transaction service fees for various transactions on the main blockchain, but also be the computed rewards on the nodes of the main blockchain, i.e., the "energy" of the main blockchain system. This will be the cornerstone of the Energy Eco Chain ecosystem.

- Putting secondary blockchain applications online will require the pledging of a certain amount of Energy Tokens on the main blockchain as collateral. The execution of secondary blockchain applications will also require Energy Tokens to act as energy, with the energy consumption rate to be collectively decided by the main blockchain community. The constant appearance of quality secondary blockchains will provide room for the sustained value appreciation of the Energy Token.

- To issue their own tokens, secondary blockchains will need to pledge a certain amount of energy tokens as collateral. The initial exchange rate of these secondary blockchain tokens will be set by the issuing secondary blockchain, and future exchange rates will be determined by market forces. Secondary blockchains will thus have a pool of their own tokens, and a pool of Energy Tokens. Those who have their own tokens may change them into Energy Tokens at any time at the latest exchange rate. An increase in the value of secondary blockchain tokens will result in a corresponding increase in the value of the Energy Token.

- The Energy Token will be the intermediary between various secondary blockchain tokens. Secondary blockchain tokens can be circulated only within the corresponding secondary blockchain, and cannot be used on the main blockchain or on other secondary blockchains. The Energy Token will be the bridge that connects different secondary blockchains, and the creditworthiness and value of all secondary blockchains will strengthen the credit value of the Energy Token.

# 3. Supporting Cross-Community Energy Transactions

## 3.1 Cross-community (Zone) Energy Transactions and Settlements

The appearance of distributed energy resources changed the existing operations model of power systems. From the measurement point -of-view, it simply involves the use of two-way measurement on the user's side to ensure consistency with settlements conducted by the power company. But in actual fact, we found some interesting issues during practical application, including the fact that the power from distributed energy resources is not consumed outside its zone. Under such circumstances, centralization of the measurement system and the billing system appears to be extremely tedious and cumbersome. Such an environment is extremely suitable for blockchain technology.

With the development of networking technologies, the calculation abilities of smart meters have already seen remarkable progress, and they now feature powerful computing and ad-hoc networking abilities. From an objective point of view, they have the ability to carry blockchain technology. Storing the energy measurement data from smart meters onto blockchains can ensure that the data cannot be tampered with, and this will safeguard the credibility of the energy measurement data. By providing energy market participants with strong credit endorsement via blockchain technology, they will be able to directly participate in the management of relevant transactions such as coal transactions, green certificate transactions, and energy efficiency management.

Intra-zone blockchain technologies are already being used in some pilot areas. These have achieved mutual confirmation, and provide technical support to direct transactions of energy within the same zone. Under such conditions, decentralized distributed energy resources accommodate to the decentralized blockchain technology, which naturally leads to decentralized settlements and the self- governing of networks. These are also incidentally the core trends in blockchain technology. Energy transactions are a key channel for energy networks to stimulate the market, and prices are a key means to achieve resource optimization. Building a decentralized energy transaction system with blockchain technology and providing it as a fair trading platform for various industries can ensure that it can be extensively applied to bidding transactions on the power market, as well as onto responses to demands, the payment of power bills, and on "charging" style payments, among others.

However, cross-zone applications have certain limitations on a physical level. The cross-chain technologies provided by Energy Eco Chain can provide technical support for cross-zone applications. By "cross-chain", we refer to the linking of different blockchains to enable the querying and sharing of data across different blockchains. More specifically, when different zones, when at their deploying blockchain platform, will choose different platforms to carry out construction. Cross-chain technology will break down the barriers to communication between different blockchains and enable cooperative operation between blockchains. This will allow power systems to abandon their fixed electronic communications logic, and realize computing accuracy via cross- chain communications between different smart meters, effectively marking losses in the system to provide physical evidence to verify that the power distribution price is reasonable.

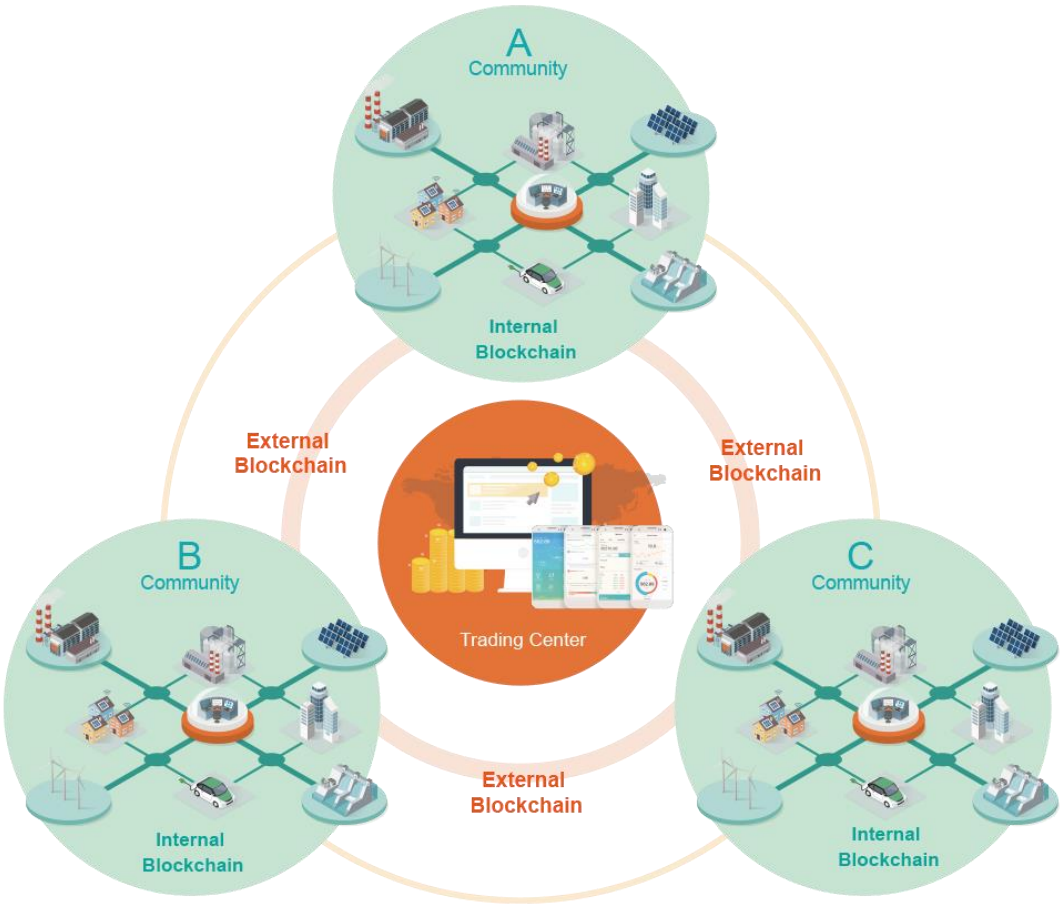


Diagram3: Cross-chain transactions

## 3.2 Trans-national Energy Trade and Trans-border Energy Payment

In 2017, the global energy market began a new round of adjustments. After over 2 years of turmoil in the global crude oil market, the situation of oversupply was greatly alleviated, and demand and supply gradually reached equilibrium as the result of stimulation by the Organization of the Petroleum Exporting Countries (OPEC) agreement to cut production concluded at the end of 2016. Following internal reshuffles within OPEC, countries such as the United States seized a greater share of the crude oil export market, and there was an acceleration in the shift of the bulk of

crude oil consumption to the Asia Pacific, leading to further diversification in the global crude oil import and export markets. The energy policies currently being formulated by the new U.S. government are also set to greatly affect global energy trends.

After the collapse of the Bretton Woods system, the U.S. dollar system, whose value was based on petroleum, had a far-reaching impact on petroleum-producing countries, countries that consumed large quantities of energy, as well as the entire world. It also indirectly lit the fuse for the conflicts in the Middle East and North Africa, as well as the worldwide terrorist attacks. This was because the inability of the balancing accounts of the countries using the petrodollar system to keep up with the US dollar resulted in world trade balances being heavily subject to the U.S. Federal Reserve and the U.S. Government. At the same time, as demonstrated by the 2008 subprime mortgage crisis, the facts proved that the departure of modern financial system, which had credit currencies at its core, from the real economy had resulted in a further increase in the risk in settling global energy in U.S. dollars. Subject to energy resource endowments, the petrodollar had another downside in that it was also subject to enormous fluctuations in the global market exchange rate and in energy trade settlement prices. In the past ten years, the global petroleum prices in U.S dollars have fallen from a high of USD110 to as low as USD30, a sign that the U.S dollar had long lost its stability, an important feature that had justified its use as a global foreign exchange standard of payment.

Meanwhile, as global environmental governance and reduction of CO2 emissions became a goal for all countries to work towards, there was the irreversible trend of reducing overall consumption of traditional fossil fuels such as coal, petroleum and natural gases along with an increase in efforts to raise their usage efficiency. In line with that, one of the methods of energy production with the highest growth potential lies in the utilization and development of renewable energy sources, particularly those with

electricity consumption at the core. China, the world's largest consumer of energy, has taken the opportunity to conduct the large scale development of wind energy and solar energy sources, and officially proposed building a global energy resource network at a United Nations summit in 2015. Under this proposal, intra- continental and inter-continental networks will be realized in phases between 2030 and 2015, and aims to fully utilize renewable energy resources in various regions of the world. Hence, it has become especially important to build an energy settlement and payment system that is applicable across countries and borders. With that, the current U.S dollar settlement system will become inapplicable, and a new-generation system for transactions will make it possible to maximize energy resource liquidity, and closely link to the development of the real economy. Even as this system fulfils high-frequency cross-border energy trade between countries and regions to the fullest extent possible, it will also minimize risk to the fullest possible extent, ensuring objective requirements such as transaction privacy, and the safety and independence of energy resources. In view of this, Energy Eco Chain will realize the following functions:

- Eco Energy Chain will make real-time distributed accounting of energy transactions possible. It will strictly adhere to energy production and consumption equilibrium principles to authenticate energy assets, and apply them to ultimately maintain balance between the overall volume of currency used in global energy trade and global energy production and consumption capacity.

- Energy Eco Chain will make coordinated, 24/7 uninterrupted transactions of multi-energy commodities possible. It will build a distributed accounting-based global, borderless platform for energy spots and futures, and capitalize on the multi-node participation and robust networks of blockchains to safeguard the public credibility, safety, and high effectiveness of the cross-border transaction

platform, as well as effectively reduce the risks, start-up capital, and time-cost involved in cross-border energy transactions.

- Energy Eco Chain will make the online tagging and tracking of energy flows in cross-border transaction, and will digitize physical processes such as the production, modification, transport and storage of cross-border energy resources through the use of blockchains. It will use and maintain the groups used in energy transactions to take flexibility and diversity into account, make it possible to effectively manage energy assets, and thereby significantly reduce the administrative costs of multi-national energy companies.

## 3.3 The Green Energy Label and Tracking

In order to develop renewable energy resources, the governments of countries are introducing various subsidies. Some governments give subsidies to energy producers, such as China's subsidies for solar energy; others give subsidies to users, through means such as the use of derivative financial instrument such as green certificates. All of these supports the development of renewable energy sources through the use of subsidies. However, subsidies to energy producers give governments enormous financial pressure. The marketization of renewable energy sources is progressing at a relatively slow place, and still has quite a long way to go. Under such circumstances, the markets are forced to look for a solution on the user side. China once used green energy policies, making use of premiums on the user side to subsidize costs at the producer's end, thus allowing the entire industry to make progress in a healthy, orderly manner. User side premiums are actually a form of initiative, encouraging companies and individuals to chip in to bear part of the expenses to work together to realize the green energy resource dream.

The electrical power of new energy sources often comes with inverters, and

objectively speaking, every inverter has its own unique electromagnetic characteristics, of which high-order harmonics are only one form of expression. We can use computing and selection to trace the inverters and tag them. The appearance of blockchain technology provides powerful support to energy flow and tagging within the same zone, and it is also in line with the needs of decentralization and the distribution method.

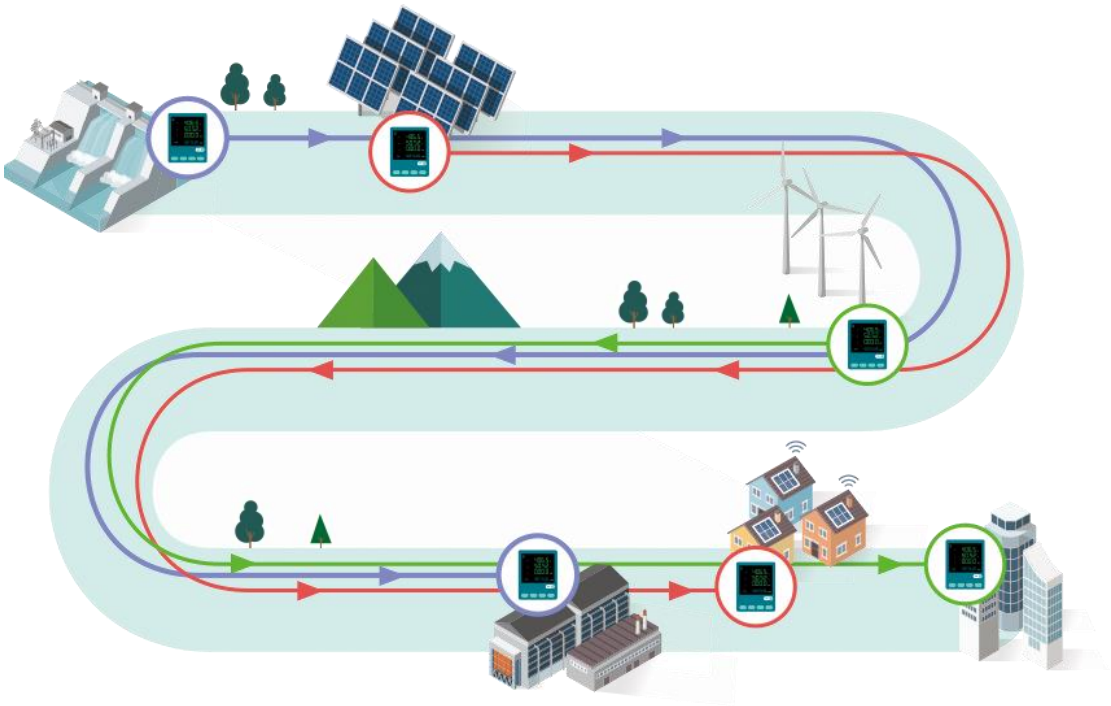

Diagram 4: Green energy tracking

The production of smart meters also produces computing and ad-hoc networking capabilities. As smart meters themselves also need to measure and record fees, they are equipped with cryptographic chips, which form an Internet of Things that is closely linked to power systems. With blockchain technology, it is no longer necessary to rely on currents and power grid topology structures, as smart meter handshakes and calculations can be used to effect the link the physical layer and the financial layer during power consumption. Using blockchain technology to reconstruct the physical communication structure of the power grid will fulfil needs of the latter such as self-organization, self-adaptability,

supercomputing, collaboration over a wide area, and safety and reliability. Blockchains have the attributes of distributed computing and distributed storage. Distributed computing can provide super computing capabilities, and distributed storage can provide enormous storage capacity. The blockchain system is a natural "long-living" system, and can continually and uninterruptedly ensure the operation of the energy system. Smart contract technology in blockchain can also make it possible for energy consumption and energy financing to correspond with each other. Blockchain technology is decentralized, trust-free, and unchangeable among other qualities, which means it can be used to track renewable energy sources. It thus has the potential to reconstruct the fundamental infrastructure of power financing.

## 3.4 Integration of Virtual Free Trade Zones and Regional Economies

In recent years, there has been closer economic cooperation between free trade ports and regions that conduct free trade following rapid development from the integration of the world's economies. Overall, the grouping and development model of this economic cooperation appears to be a plural, multilateral model where the "club" of capitalist, developed countries widely engages with even more developing countries. By "Free Trade Zones", we mean trade arrangements that provide more privileges for in trade and economics than those allowed under the WTO's relevant regulations, such as the designation of special zones outside the borders of a sovereign country or region where goods from foreign countries can be imported and exported without tariff. In practice, these are tax-free zones that are practicing free port policy using the modern sovereign currency system.

As a fundamental of economic cooperation between different zones, the

core of international trade theory requires the objective existence of comparative advantages and elements between trading countries. Regardless of whether the trade is in goods or in services, the entire global trading market is built upon this fundamental principle. This is true even though modern economists have built a model that integrates global trade with global finance that centers around the purchasing power parity theory, and then built a global foreign exchange market based on that. However, the enormous differences in financial systems and degree of globalization in different countries have caused global trade to become one that is unilaterally dictated by a few countries forming a trade oligarchy. It is therefore difficult for some emerging economic bodies with smaller economies to obtain a fair, reasonable trading environment in multilateral international trade. At the same time, developing countries often find themselves at a disadvantage as they may find it difficult to achieve effective bargaining power due to issues such as a lack of human talent, or language or legal barriers. The lack of an effective mechanism to reflect the true effectiveness of the country's trade industry already stands in the way of regional economic cooperation.

| Policy Trend | Type | | | | |
|---|---|---|---|---|---|
| | Free trade zone | Tariff alliance | Joint market | Economic alliance | Full economic alliance |
| Removal of tariffs and quotas | √ | √ | √ | √ | √ |
| Common tariffs for external bodies | × | √ | √ | √ | √ |
| Factor liquidity | × | × | √ | √ | √ |
| Coordinated economic policies | × | × | × | √ | √ |

| | | | | | |
|---|---|---|---|---|---|
| Completely uniform economic policy | × | × | × | × | √ |

Table 1: Types of groupings in integrated regional economies

For such reasons, free trade zones are very attractive to the increasing number of countries that are increasingly active in participating in international trade and globalization. However, there are many challenges to building a traditional free trade zone or integrated regional economies such as through a tariff alliance. These include cumbersome legal procedures that involve many links and can take a long time to complete; the different needs and requests of the countries or sovereign bodies involved, which may result in the limited acceptance of terms and conditions and difficulty in reaching a common understanding; or the sheer number of goods and services and industries involved, making it hard to decide on common settlement cycle for trades from port and resulting in higher economic and time costs. Differences in the amount of exports and demand could also lead to differences in concerns in each country's benefitting entities. All these issues lead to differences between predetermined policy and the actual effects upon execution, which explains the enormous cost of setting up a free trade zone (or port). Thus, Energy Eco Chain will achieve the following functions:

- Energy Eco Chain will enable the virtualization, digitization and platformization of free trade zones (or ports) that involve multiple transacting entities (nodes). It will use blockchain's unique distributed multi-nodal, mass participation features to ensure the common knowledge of tedious legal regulations and trading categories.

- Energy Eco Chain will enable free entry and exit in virtual free trade zones (ports), which will effectively help countries participating in an integrated regional economy to avoid the risks and costs arising from limited common understanding or disputes between participating

countries (such as Brexit).

- Energy Eco Chain will realize a participative system where all participating notes can take part in monitoring and administration. This will result in a more transparent and effective monitoring process, which will in turn safeguard the public credibility, complexity, reliability and scalability of the integration of the regional economies, exploring possibilities using trade in energy (goods and services) as its pioneering example.


Diagram 5: Illustration of the EEC free port that will strive for trade in energy, goods and services

# 4. Creating an Ubiquitous Energy Community

## 4.1 A Multi-functional, Mutually-complementing Energy Internet

The Energy Internet is a technical grouping that uses wide-area networks for the production and transaction of raw energy materials, the production of energy through various means, and their collective transport, distribution and consumption. This enables the exchange of energy and information, which aids the mutual accommodation and adaptation of various types of energy resources to each other, increasing the effectiveness and reliability of energy transmission services. The Energy Internet widely uses smart features that are capable of analysis and transmission, ensuring that the different types of energy sources complement each other, and that the information on the user and seller-sides correspond, thus making it possible to jointly optimize both open transactions and central control scheduling. By using its own decentralization capabilities, the smart transaction matching capabilities of blockchains and the latter's record traceability and inalterability, Energy Eco Chain is able to help the Energy Internet complete price recording and transactions in an extremely reliable and speedy manner.

**The decentralized nature of Energy Eco Chain**

In the previous generation of the Energy Internet (which was mainly in the electricity systems), energy (mainly electric energy) transactions were completed in the market transaction department of a dispatch center. This

powerful transaction department lacked external monitoring, which put it at risk of losing credibility. After Energy Eco Chain is implemented, data to be stored will be distributed onto nodes on the network which will jointly complete the storage. This not only decreases the cost to credibility, but also costs to the ultimate users of using energy.

### How Energy Eco Chain matches and executes smart transactions

Based on the ability of blockchain technology to generate smart contracts, raw energy materials, energy sellers (such as coal power plants, wind power plants and solar power plants) and buyers (such as industrial users, agents for residential users and users of stored energy or electrically-powered vehicles) can submit quotes and authorize transactions on the Energy Eco Chain application interface. The smart matching process of Energy Eco Chain will coordinate with its system's physical permissions processes to generate a transaction contract.

At a specified transaction time, the transaction logistics will automatically report the logistics execution information on the transaction subject to Energy Eco Chain and its secondary chains. Based on the execution situation, Energy Eco Chain will clear the transaction and execute the transfer of the digital currency. It will also automatically levy and settle the contract violation penalties for any party that fails to fulfil the contract. The transaction procedure is illustrated below:

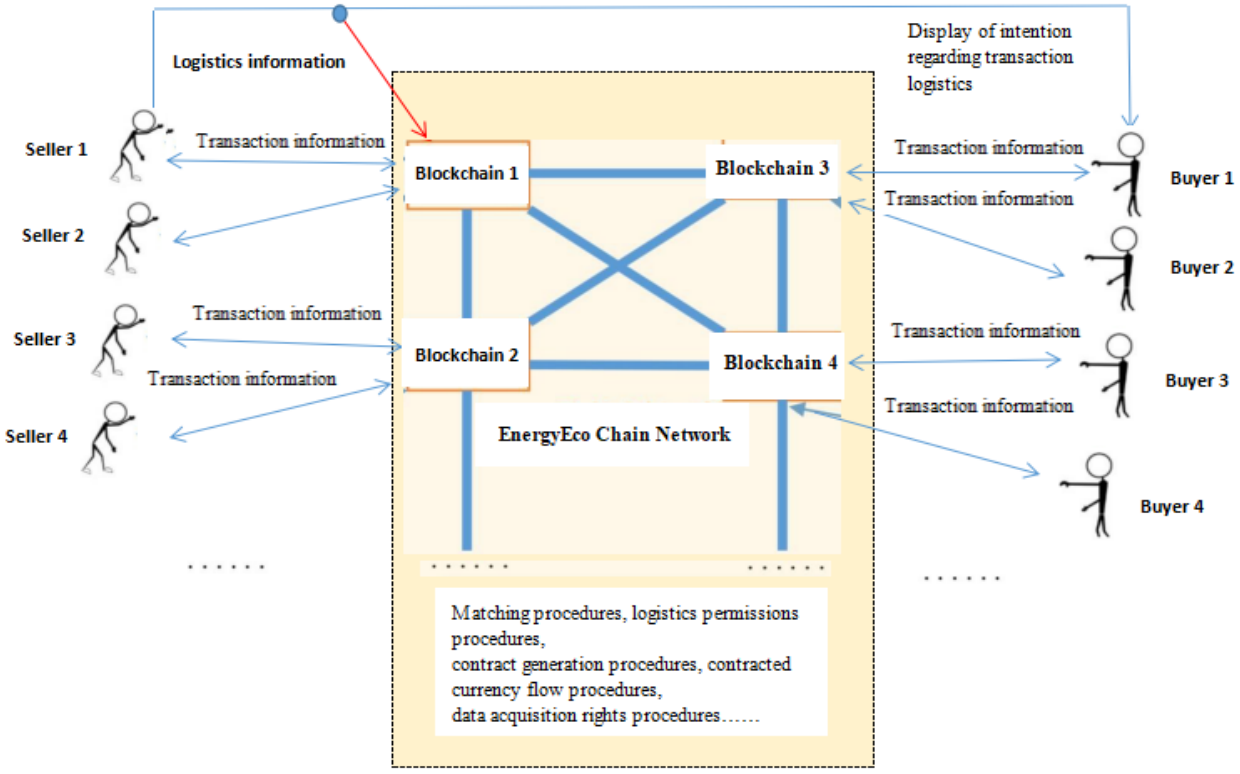


Diagram 6: Smart Trading Diagram

**Energy Eco Chain transaction methods: Traceable and unalterable**

Energy Eco Chain utilizes a time stamping system, using the blockchain system to carry out backup storage. Price information for raw energy materials and energy production and consumption, and information on contract generation and fulfilment status, logistics and currency flows can be safely committed onto the blockchain, providing an enquiry system for authorized users. This is possible because transactions on Energy Eco Chain are traceable, and issues such as hacker attacks will not cause the data to be lost or altered.

Based on its unique qualities such as decentralization, abilities to generate smart contracts, mediate transactions and conduct peer-to-peer transmissions, open and transparent transaction regulations and execution statuses, and ease of query into historical data, Energy Eco Chain is able to take on the role of mediating and executing Energy Internet transactions.

## 4.2 Game Optimization of Smart Power Grid Blockchains with Active Distributed Power Grids

As the base technology behind virtual currency—blockchain technology—continues to develop and advance, many sectors outside the finance sector have begun to consider and experiment on how they can use blockchain technology across different sectors. Even now, there are many cases where having one central energy system alone is hard to satisfy the needs of optimization and dispatch needs of the energy system. For example, in the United States, ISOs (Independent system operators) and many power distribution companies exist as independent entities. Even in China, with the production of new energy resources and the development of active energy distribution networks, the existing highly centralized system proves to be chaotic during the dispatch, operation, and optimization processes, resulting in the waste of resources and a lack of transparency in communications. These industrial ailments can be alleviated as blockchain technology is increasingly adopted. Energy Eco Chain will build an optimized model of a distributed smart energy network that is based on blockchain.

**Physical structure**

In this model, the physical structure of the electrical power system can be categorized into three (or more) layers. The topmost layer is the power transmission network which has the most units and is mainly responsible for transmitting and generating electricity. The middle layer is the power distribution network, which is mainly responsible for the distribution of electrical power. At the same time, the power distribution network has a small number of smaller units. The electrical power generated by these units is able to directly form a network near the substation, and therefore these smaller units also have a certain degree of ability to generate

electrical power. Besides these layers, the power distribution network is also responsible for contacting, communicating and interacting with the top and bottom layers. The bottom layer is the active power distribution network, which allows electric car stations, flexible loads and the like to conduct energy interaction with modern transmission and distribution systems. Managing the power distribution network and the active power distribution network layers in separate zones will result in the topological structure of the electrical power system to transform from the current centralized system into one that is distributed, multi-layered, and decentralized.

Besides this, the outer layer of these core electrical power network systems require the setup of multiple information storage and transaction centres, which will serve to administer and maintain the finance and communications parts of the entire system.

**Data storage and transaction systems**

Once you have a distributed physical model, you still need to actualize the data storage, encryption, reliability and communications functions of the various parts of the electrical system. The new electricity system can only function reliably, safely and fairly if it has support from mature, safe and reliable base technologies.

The advantages and unique characteristics of blockchain technology lie in its unalterable, decentralized nature. Such a model makes it precisely suitable for use for data storage and for keeping record of energy transmission transactions. In keeping with the principles of ensuring efficiency and minimum cost, this model could utilize the consortium model, in other worse, blockchains with multiple centers. Some nodes would have all read and write permissions and be set as full nodes or semi-full nodes. These will store all information on the network that has been

transmitted by all nodes, encrypted and then uploaded. The remaining nodes will have limited read and write permissions, and be set as lightweight nodes. These will only record all information from the leading blocks as well as optimization and transaction information related to itself. The layout and role of the nodes are as illustrated below:

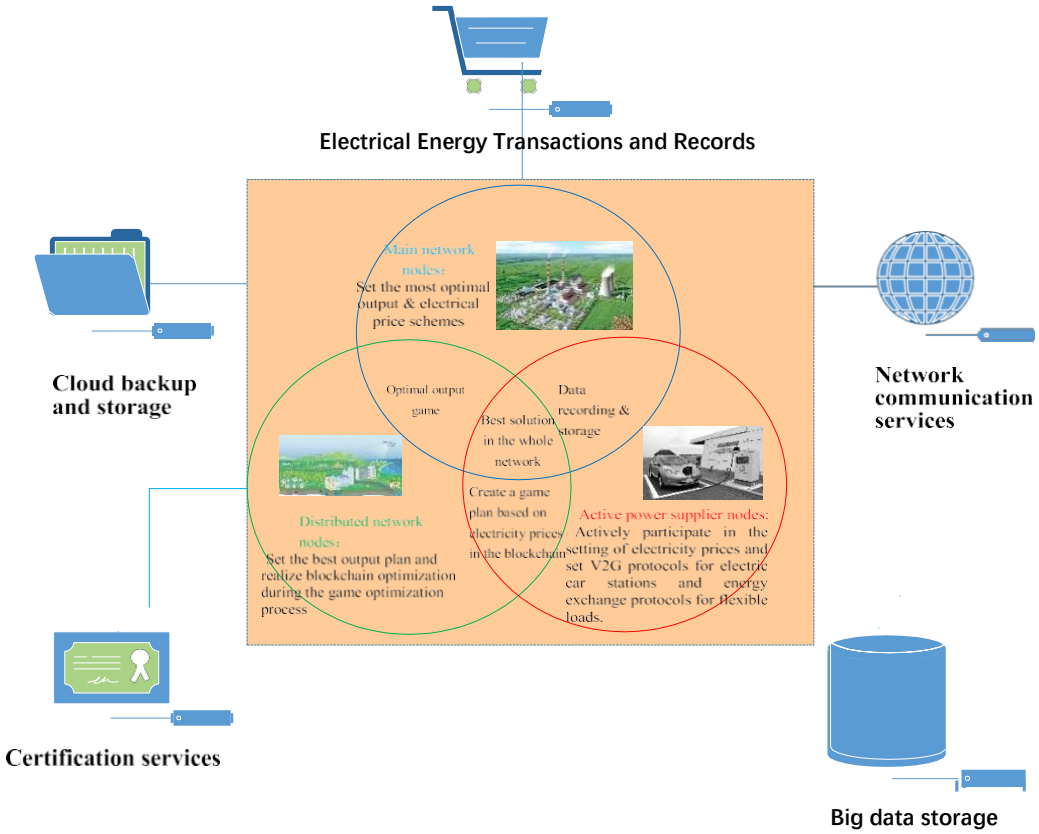


Diagram 7: Applications of blockchain and the storage roles of each node in this model

In this model, all nodes exist as transaction centers, and in substance, are a group of centralized systems with distributed authorities. These systems have two responsibilities:

- Record all information flowing through the blockchain.
- Use the information and parameters stored in the database to fix lie congestion issues.

### Game technology

In the new electrical power system of the future, the power transmission and distribution networks and the new active distribution networks will become independent. Much of the information that travels between entities are industrially sensitive, and their originating bodies will not want them to fall into the hands of other bodies. For this reason, the privacy of the data and information in the electricity network needs to be guaranteed. However, the existing centralized system makes it technically difficult to build trust or prevent fraud. This model combines the distributed model of decentralization with its own blockchain technology that is capable of building trust, which thereby solves the problem.

The three physical models in this layer form two interconnecting double-layered game optimization models. The first double-layered game optimized model consists of the power transmission and distribution layers, both of which seek to attain maximum optimization for their own objective functions (e.g. the least capital cost). However, at the same time, they also seek to fulfil the load demands. Both layers therefore need to apply game theory in order to confirm a result that will satisfy both parties on a fundamental level. Once the double-layered game model is complete, the game iteration process for the second double-layer starts. After this has attained optimization, it is reverted to the first game model to be optimized, and the process continues until the optimization results of the entire system are stable. The three-layered model can also be expanded into a multi-layered model. However, one needs to be aware that the more layers, the more iterations and cycles needed, and the costs of communication of the middle layers will also increase as a result, making it necessary for each layer to have the support of stronger computing, storage and communication technologies.

Blockchain technology can guarantee that no fraudulent data is

transmitted in the process of information transmission and iteration. In this computing method, the nodes in each layer do not just store the time-stamped blockchain data locally in the game optimization process, but also encrypt this data and upload it to the network. The nodes at the corresponding transaction center selectively record the necessary information and carry out cloud backup for the node. The transaction center is also decentralized, so every set of information is stored in a few different transaction centers to prevent any one transaction center from holding absolute authority, uploading fraudulent information, or falling victim to a network attack. All nodes on the network need to adhere to the endorsement policy when carrying out transactions. If any node has suspicions about the veracity of the iterative computing process of another node, it can use the fee payment method to apply for mediation to the entire group of nodes that saved the relevant information. If all the notes judge that the cloud backup data of the node under inspection is consistent with the data it transmitted, the transaction is deemed to be fair.

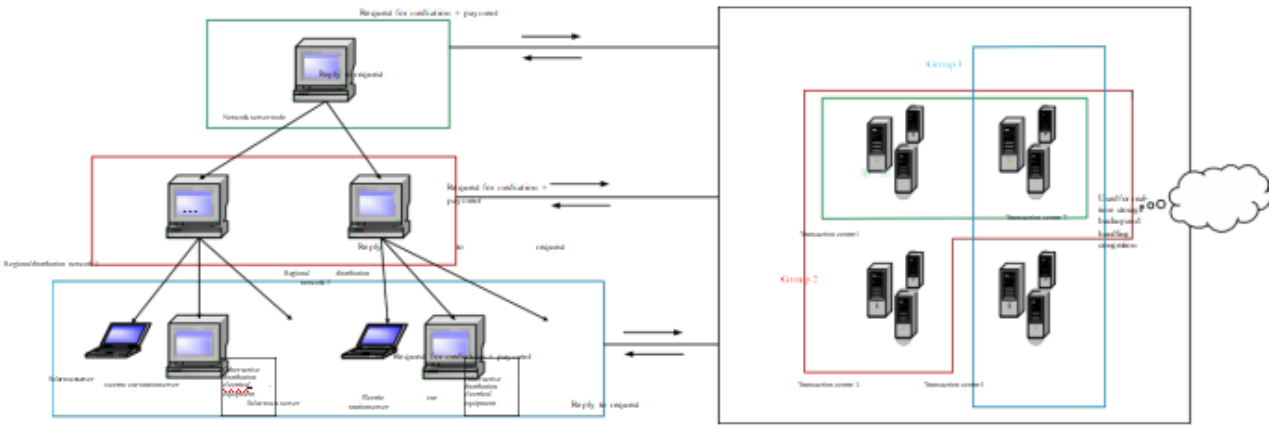

Diagram 8: The storage and trust system in a consortium chain model

# 5. Supporting the Application of Open Energy Sources

## 5.1 Energy Efficiency Management

In energy efficiency management, the key issues are whether or not it is possible to measure and audit energy data in a credible way, and whether or not the openness and transparency of the energy data can be guaranteed. There still exists flaws in current energy efficiency management processes with regard to the above. First of all, there are many participating entities in energy efficiency management, some of whom do not participate nor conduct audit as independent third parties. This results in a lack of trust between the various participating entities. Besides this, it is possible for the energy data to be altered during the measurement and auditing process. Thus, the openness and transparency of the entire measurement and auditing process cannot be guaranteed.

Energy Eco Chain provides a platform that solves the abovementioned issues that occur during energy efficiency management. Energy data is very precisely measured using smart measuring devices, and then uploaded to the Eco Energy Chain in real time. Energy Eco Chain packages and stores the energy data and timestamps it, forming a blockchain ledger of energy data. Energy Eco Chain will give query permissions to participating entities such as electricity users, energy efficiency companies, energy reform investors and government supervisory bodies. These participating entities can query the energy data on Energy Eco Chain in real time, and maintain it together.

The Energy Eco Chain platform has the following advantages:

- It makes it possible to manage the energy data in a credible way. Blockchains are decentralized, so using blockchain technology to store and manage energy data solves a number of issues of trust between the various participating bodies, thereby making it the trustworthy management of energy data possible.

- It makes energy data open and transparent. On the Energy Eco Chain platform, energy data is measured by smart measuring devices before being uploaded to the blockchain in real time. Authorized participants can query and find the data on the blockchain at a ny time.

## 5.2 Management of CO2 Emissions

Currently, where CO2 emission management is concerned, the approval efficiency of CO2 quota permits is low, and it is difficult to track CO2 assets. Firstly, there are many electricity producers, and for government environment supervisory departments to carry out one-to-one permit approval would require a huge expenditure in terms of time cost, resulting in a low approval efficiency rate. In addition, guaranteeing the authenticity of CO2 assets requires them to be tracked, but CO2 emission permits are frequently traded between many companies, which makes it difficult to do so.

Energy Eco Chain provides a platform that solves the above issues. Specifically, the CO2 emission quantities of companies with reduced emissions can be uploaded onto the blockchain, where Energy Eco Chain will carry out packaging, storage and timestamping. The smart contracts on Energy Eco Chain can be used to carry out automatic approval and verification on the CO2 quotas by comparing them against the CO2 emission data of reduced emission companies. When the transaction of CO2 permits is in process, the transaction information will be recorded in real time on Energy Eco Chain, and this information will be trackable. In

addition, the reduced emission companies and relevant government bodies are authorized to query the data on the blockchain, which guarantees the openness and transparency of the data.

The Energy Eco Platform has the following advantages:

- It improves the approval efficiency of CO2 quota permit applications. Data on the CO2 emission quantities of the companies are uploaded onto Energy Eco Chain in real time, which guarantees its openness and transparency. Smart contracts are able to ensure the automatic verification and approval of CO2 quotas, which saves government departments the time otherwise needed to carry out one-to-one verification and approval. Efficiency is therefore improved.

- CO2 assets can be tracked on the platform. When carrying out transactions of CO2 permits, Energy Eco Chain records information about the transaction in real time. Every signature and piece of verified effective transaction information on Energy Eco Chain includes information about the source of the transaction, which guarantees that every transaction is trackable and traceable.

## 5.3 Smart Meters and the Blockchain

A smart power meter has a microprocessor as its core installation, and bears the duty of collecting, measuring and transmitting raw data on electric energy. It is the base that realizes information gathering, the optimization of analysis and the display of information, and makes possible features such as bidirectional metering, remote/local communication, real-time data exchange, complex tariff charging, remote termination of electrical power supply, power quality monitoring, and user interaction. As technology advances and electric power becomes increasingly marketized day by day, traditional meters that require humans to read them are

gradually fading from history, and meters with communication features are increasingly favored by the market. New models of smart meters are not only able to carry out phase metering, but are also able to upload the parameters that they have metered onto an power server via a communication network, which makes the large-scale management of electrical energy data possible and data measurement that is faster and more accurate than ever. Smart meters also have powerful storage features, and can use historical data to compute demand for electrical power, come up with a reasonable analysis of electrical power levels, advise users to carry out time-based power management, and through that realize the unification of monitoring and management.

The next generation of smart meters will have embedded load identification algorithms, which will increase the precision and applicability of load identification. As long as they are somewhere with internet access, users will be able to find out about the status of their home power usage, analyze whether or not their power usage behavior is reasonable, carry out remote monitoring and control of their home electrical devices, and analyze whether their electrical power consumption is normal, all these at any time and any place.

When combing Energy Eco Chain with an electrical power system, smart meters are fundamental equipment and cannot be left out of the equation. Every single user of Energy Eco Chain has installed a unified Energy Eco Chain client that can provide quotes in advance. This client can record information and transmit information to other nodes. It is also able to link with the smart meters of users who are direct electricity producers and consumers, and automatically upload their electricity production or consumption data to be recorded on Eco Energy Chain via the communication network. When it is time for a transaction, a smart contract will automatically complete the transfer of funds based on the electric power data sent by the smart meters to the blockchain. If an electricity

producer generates a relevant volume of electric power at the stipulated time, the electricity charges will be automatically transferred from the user's account to the producer's account. If the producer fails to generate the relevant power, the relevant penalty will be deducted from its account. This process will be automatically executed beforehand by the smart contract. The smart contract is recorded on Eco Energy Chain, and the electric power data is also saved on Eco Energy Chain. Both are inalterable, which guarantees that the agreement concluded beforehand by the producer and user can be fulfilled, and solves the trust issue between the two transacting parties. On top of that, there is no need for a third-party system to participate in the process up to settlement, which lowers the cost of transaction.

## 5.4 Energy Eco Chain Will Unlock the New Era of Big Data

**Reconstructing big data interfaces**

Energy Eco Chain will break the data oligopoly that oligarchical firms in the energy industry have over energy information. In the traditional ecosystem of the energy industry, most of the production, consumption, and data transmission of energy is neither open nor transparent, and these are not easily accessible by third parties. However, in Energy Eco Chain, energy data that is hashed and encrypted is unalterably recorded on the blockchain, and also traceable. Third parties are allowed to deconstruct and analyze the energy data on the grounds that privacy is protected.

Energy Eco Chain will enable the fusion of data in the energy sector. The liquidity of energy resources involves many links, including production, consumption, transport, and storage. Data from different chains and different types of energy sources will usually fall into the databases of different entities in the energy resource world (e.g. petroleum mining firms will possess data on petroleum mining and crude oil import/export

transactions, and natural gas pipeline companies will possess fata on natural gas transport networks), which results in enormous data cost to big data searching. Energy Eco Chain will collect the data from the whole processes of energy production, consumption, transmission and storage, and enable the merging of data across industries and links in the energy sector.

Energy Eco Chain will eventually become the entrance to all big data. It will break the oligopoly over data, merge reliable energy resource data and restructure big data interfaces, and will drastically reduce time and manpower costs in the collection of big data and in data cleaning, improve data processing efficiency, and become the entryway to all future applications and innovations of big data.


Diagram 9: Energy Eco Chain will unlock energy big data

### Energy data maps economic trends

Ever since the second industrial revolution, humans have entered the age of electricity, with rapid developments in socioeconomics. In any phase of development, the level of energy production and consumption has directly

reflected the level of economic development. In other words, energy data can indirectly reflect economic trends and situations, and function as a guide to governments, firms and ordinary people in the aspects of policy, plans and lifestyle. When it has integrated energy big data, Energy Eco Chain will provide boundless possibilities to the application of big data. Below are a few scenarios where Energy Eco Chain big data may be applied:

- Energy Eco Chain big data optimizes the deployment arrangements of firms. The energy data on Energy Eco Chain reflects the level of economic development and development potential in a region. If a particular region has a low level of overall energy consumption, it suggests that the region is behind in terms of economic level, and therefore has comparatively higher investment potential. The reverse also applies. In addition, a region's energy consumption data also reflects its energy structure, energy utilization methods, and other extra information, which can provide a basis for government and company policies. The energy consumption data saved on Energy Eco Chain cannot be counterfeited, and is thus more capable of truly reflecting a region's economic conditions than traditional sources of data.

- Energy Eco Chain big data can analyze the business situation at user-companies. A company or industry's energy usage situation and trends can directly reflect the latter's production efficiency, and whether it is in the growth or recession phase. Analyzing data such as the consumption rates and electricity charges paid by an energy-using unit on Energy Eco Chain can provide direction for upstream and downstream business transactions, business negotiations, precision production, inventory reduction and other processes.

# 6. Currency Mechanism

## 6.1 The Limitations of Existing Credit Currency and Bitcoin

### 6.1.1 The limitations of traditional credit currency

Early currency was based on either the gold standard or the gold exchange standard. In other words, the value of a currency was based on a fixed quantity of gold, and the amount of currency issued was determined by the amount of gold in the reserves, which guaranteed the stability and reliability of the currency. After the Second World War, a system similar to a gold exchange standard system was established under the leadership of the United States, with the objective of maintaining the prosperity of the global economy and global trade. This was the Bretton Woods system. Under this system, various countries pegged their currencies to the U.S. dollar, and the U.S. dollar was in turn pegged to gold, with a fixed exchange rate. With this system, every unit of currency held by an individual could be exchanged for a fixed amount of gold, and the value of currency was thus adequately guaranteed.

As the growth in social wealth sustained, the U.S. Government had to continue to issue U.S. dollars to satisfy an entire society's demands for financial liquidity and transactions. There were inconsolable contradictions between the limited quantity of gold and the growing U.S. dollar. With the corresponding depreciation of the U.S. dollar, the rigid exchange rate system resulted in growing doubt over the convertibility of the U.S. dollar to gold. The central banks of various countries decided to brace themselves by converting the U.S. dollars they held to U.S gold reserves, which resulted in the amount of gold in the U.S dollar gold reserves to gradually decrease and caused a gold-buying craze. In

December 1971, the Federal Reserve began to reject sales of gold to central banks overseas. In February 1973, the U.S. dollar further depreciated, and the other key currencies in the world were forced to adopt a floating exchange rate system, leading to the complete collapse of the Bretton Woods system.

Following the collapse of the Bretton Woods system, the U.S. dollar was no longer pegged to gold; the U.S. dollar and the other currencies also no longer utilized a fixed exchange rate system. Instead, they switched to a "managed float regime". From then on, the world entered the era of credit currency. Under this system, the value of each country's currency would be guaranteed by its government's credit. Credit currency has no intrinsic value in itself; the gold base of the past no longer existed. A credit currency can flow and be accepted as a measure of value due to the country's commitment to pay for it as a value symbol.

Credit currency has its flaws. When the total volume of a currency in circulation far exceeds the volume required for the overall quantity of products, there will be currency inflation and the currency value will depreciate. In recent years, many countries have been experiencing currency credit crises. Currency inflation rates in Zimbabwe once exceeded 11,200,000%, and this vicious inflation ultimately caused the Zimbabwean dollar to be withdrawn from legal tender. Similar cases of vicious inflation have also occurred in Poland, Turkey, Peru, Argentina, Venezuela, and many other countries. Historical experience has shown that government credit is not necessarily reliable, and the collapse of government credit can cause the collapse of the country's currency system and immeasurable loss to holders of the currency. Even the United States, with its high credit rating is not spared—the recent oversupply of currency has shaken the confidence in the U.S. dollar of investors all over the world. China, for example, has lowered the weightage of the U.S. dollar in its basket of currencies in recent years. One of the campaign

platforms of Donald Trump, the new President of the United States, was to reduce the volume of newly-issued U.S. dollars, increase U.S. dollar interest, and restore the confidence of international investors in the U.S. dollar.

### 6.1.2 The limitations of Bitcoin

Bitcoin achieved decentralization through the use of blockchain technology, and freed currency issuance and circulation from the control of third-party systems, solving the confidence issues of credit currency through the principles of encryption. However, Bitcoin's own attributes have given it certain limitations.

From a short-term perspective, the vigorous fluctuations in the value of Bitcoin have significantly influenced its value storage function. As Bitcoin is not tied to any currency, its value is extremely unstable, making it more similar to a speculative product rather than a currency, and causing merchants to find it difficult to accept Bitcoin as a payment mechanism.

From a long-term perspective, the overall quantity of Bitcoin will reach a maximum of 21 million, and the reasons for the existence of an upper limit are similar to those for gold. When Bitcoin has been fully mined, its scarcity will inevitably bring about currency deflation and trigger an economic crisis in the Bitcoin world. It is foreseen that when that happens, the liquidity of Bitcoin will decrease drastically, and Bitcoin will be unable to assume the responsibility of being a currency and will gradually become no more than a collectible.

## 6.2 How Energy Tokens are Unique

The design of energy tokens will inspire new philosophies on an "energy

standard" and an "equity mechanism", abandon the flaws of credit currency and Bitcoin, and break through their stubborn limitations.

### 6.2.1 The energy standard

The Energy Token will be based on the "energy standard", where the value of every Energy Token unit will be equivalent to a fixed amount of energy and the exchange rate between the Energy Token and energy will be fixed. The overall amount of Energy Tokens will be fixed, and this will be pegged to the overall amount of energy resources in the world. Holders of the Energy Token will be able to exchange units of Energy Token for a fixed volume of energy at any time. In a human society that has energy as its room driving force, the Energy Token, which is based on energy resources, has extremely high stability. Therefore, the unique characteristic of the energy standard gives Energy Tokens the following major advantages over other currencies:

Compared to gold standard currencies: The rate of issuance of gold standard currencies was anchored to the rate of gold mining. However, in today's society, gold mining efficiency is already out-of-step with society's overall productive efficiency. On the other hand, the rate of issuance of the Energy Token is anchored in the speed of energy production, and the production rate of energy is largely proportional to the overall productive efficiency rate of society. Therefore, even if the society's productive power develops at lightning speed, the Energy Token, based on the energy standard, will not become like the gold standard currencies and obstruct free trade in market economics.

Compared to credit currencies, the stability of the Energy Token will be safeguarded by the energy exchange rates determined by the energy standard, The energy standard system will be stored forever on the blockchain, and the latter's unalterable natures maintained by the

principles of encryption. Therefore, users of Energy Eco Chain need not worry about the credibility of the Eco Coin.

## 6.3 Issuance Plan

### 6.3.1 Token issuance protocol

The total quantity of issued Energy Tokens (Code: ET) will be 600,000,000 (600 million) pieces. There will be no further issue in the future.

The distribution protocol of the token is as follows:

| Token Distribution Plan | | | |
|---|---|---|---|
| **Ration** | **Quantity** | **Uses** | **Remarks** |
| **25%** Issued overseas | 50,000,000 | Public offering | Announce the smart contract address on the official site |
| | 50,000,000 | Pre-sales | To register on the pre-sales namelist on the official site |
| | 50,000,000 | Private purchase | By invited investors from core organizations |
| **25%** To be managed by the Foundation | 30,000,000 | Team incentive | |
| | 30,000,000 | Commercial promotion | |
| | 45,000,000 | To sustain operations | |
| | 45,000,000 | Overseas investment | |
| **50%** For mining | 300,000,000 | Pre-mining | |

Table 2: Token distribution plan

## 6.4 Estimated use of funds

| Estimated use of funds | | |
|---|---|---|
| **Proportion** | **Use** | **Details** |
| **50%** | Development of technology | To be used for the tech team's R&D into the blockchain technology behind Energy Eco Chain (Main block technology payment and settlement in energy and electric power trades, applications of blockchain in distributed energy supply chain management, etc) |
| **30%** | Commercial development | To be used for public relations, publicity, promotion of commercial applications, training |
| **10%** | Re-investment | Re-investment in the Blockcha in companies/projects held in trust by the Foundation |
| **10%** | Operation of the Foundation | The Foundation's daily operating expenses |

Table 3: Estimated Use of Funds

# 7. Development Plan & Timeline

## 7.1 Development Plan

The strategic development plan of Energy Eco Chain is divided into the three phases below:

- **Crowdfunding phase**: Open crowdfunding to investors according to

the Energy Token issuance mechanism scheme, to support main chain research and development and application arrangements.

- **Research & development phase**: Complete development of the fundamental Energy Eco Chain code and upload it to the main chain. Develop parallel multi-chains, inter-chain identification, modular applications and other functions, and perfect the Energy Eco Chain ecosystem.

- **Application deployment phase**: Develop secondary chain applications on Energy Eco Chain, starting from energy industry applications. Includes multilateral transactions on the power distribution network, cross-country energy transactions, analysis of energy big data, etc.

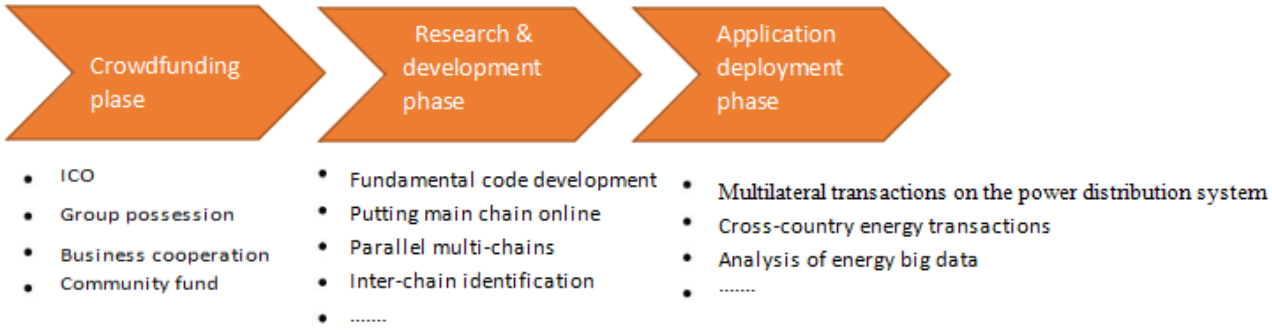


Diagram 10: Energy Eco Chain development roadmap

## 7.2 Timeline

The tactical work arrangements of Energy Eco Chain will be conducted as per the following timeline:

**Stage 1(Q4 2017 – Q4 2018)**

- Develop the Energy Eco Chain blockchain network. Design the

blockchain identification system and the core encryption method.

- Research and produce the prototype for the Energy Eco Chain end device. Design a smart end device that has stable operation, as well as network hardware for the blockchain nodes. Guarantee the stability of the development environment.

- Develop the client end-device for the Energy Eco Chain. Design an automated, smart client end-device. Ensure that the fundamental functions of the client device work, and leave an API interface for any future expansions.

- Build a green energy labelling mechanism. Track the production and flow of energy in the world of energy resources, and realize the "energy standard" feature of the Energy Eco Chain.

- Build a green energy labelling mechanism. Track the production and flow of energy in the world of energy resources, and realize the "energy standard" feature of the Energy Eco Chain.

| Milestones in the Energy Eco Chain Development Plan (Stage 1) | |
|---|---|
| 1 Nov 2017 | The Foundation is established; announces development plans |
| Dec 2017 – Jan 2018 | ICO completed |
| Feb – Mar 2018 | List Energy Token on the major transaction markets |
| Jun 2018 | Start usage of the main EEC chain |
| Jul 2018 | The corporate-class digital bank goes online |
| Aug 2018 | The project's distributed financing platform goes online; secondary chains for other commercial applications<br>continue to be developed |

| | |
|---|---|
| Nov 2018 | The Energy Eco Chain Foundation hosts a the World Blockchain Summit and pushes for the formation of a regional identification mechanism for digital energy trading |
| Dec 2018 | The digital energy trade transaction platform goes online |

Table 4: Energy Eco Chain Development Plan (Stage 1) Milestones

**Stage 2 (Q1 – Q4 2019)**

- Build a trial autonomous energy community. Choose a suitable power distribution network or smart city to act as a trial autonomous energy community, and install Energy Token end device prototypes and client terminals in the zone's energy interfaces. Make the settlement of Energy Tokens possible.

- Completion of the end-device hardware. Upgrade the functions and expandability of the hardware based on the outcome of the trial, so that the hardware will have production capacity.

- Continue to upgrade the client end-device. Design a variety of additional functions for the client end-device, including support functions for service clearance, smart optimized energy consumption, carbon emission management, etc. Perfect the energy resource ecosystem for the Energy Token network

**Stage 3 (Q1 – Q4 2020)**

- Mass production of the end-device hardware. Standardize the end-device production process, to support a larger scale of user demand.

- Build multiple ubiquitous energy communities. Gradually expand the clusters of energy users who use the Energy Token, increase market

share and gain market reputation.

- Deploy more API. Create a software development toolkit and increase the expandability of the network. Allow other groups to carry out secondhand software development on the Energy Eco Chain blockchain, to enrich the range of energy applications.

- Launch multiple support systems for energy applications. Make the application of the Energy Token in vehicle charge/discharge management, energy efficiency, emission reduction and carbon emission management, raw energy material transaction and supply chains a reality.

**Stage 4 (In the long run)**

- Full-speed production of hardware equipment. Further expand the scale of end- device hardware production, and provide support for the building of ubiquitous energy communities.

- Make the ubiquitous energy community design widespread. Deploy the Energy Token blockchain system in energy communities that possess certain fundamental conditions, and build a comprehensive system for the Energy Token and Energy Ecosystem to make energy production and consumption more eco-friendly, smarter, and more efficient.

- Revamp the software and hardware iterations. Upgrade the efficiency of systems operations, and maintain the Energy Token ecosystem.

# 8. Contact Us

You may contact us via the following social media accounts. Look forward to working with you!

- **Official Site http://energyecochain.com**

- **Twitter**

Energy Eco Chain https://twitter.com/EnergyEcoChain

- **Facebook**

Energy Eco Chain https://fb.me/EnergyEcoChain

- **Telegram**

Energy Eco Chain https://t.me/EnergyEcoChain

- **Weibo**

Energy Eco Chain https://weibo.com/EnergyEcoChain

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