Problem Statement

As climate and environmental problems are becoming more and more serious, in order to protect the home on which human beings depend, countries have proposed their own schedule of carbon neutrality and carbon peaking in their respective government work reports, and the Japanese government has proposed to achieve carbon neutrality by 2050 in October 2020 [1]. The Chinese government has also set a specific time frame for carbon peaking and carbon neutrality in the government work report [2]. According to Zhang [3], the measure of carbon emissions trading for manufacturing companies has been effective in reducing carbon emissions in China for many years, with car companies producing low-emission or no-emission products, such as Tesla and BYD, making huge profits from the sale of carbon emission targets, and car companies producing high-emission products, such as Volkswagen and Geely, actively developing low-emission products and promoting technological progress. A multi-win situation has been achieved. However, complete carbon neutrality is a universal goal that requires the participation of everyone, so consider how to allow ordinary citizens to participate in the carbon emissions trading system.

1. Government of Japan, “Carbon Neutrality”, Available from: <https://www.japan.go.jp/key_policies_of_the_suga_cabinet/carbon_neutrality.html>

2.Government of China, “Government Work Report”, Available form: <http://www.gov.cn/zhuanti/2021lhzfgzbg/index.htm>

3. Zhang, Wei, Jing Li, Guoxiang Li, and Shucen Guo. “Emission Reduction Effect and Carbon Market Efficiency of Carbon Emissions Trading Policy in China.” Energy 196 (April 1, 2020). doi:10.1016/j.energy.2020.117117.

Questions

1. In which area can ordinary citizens participate in the carbon market?

The electricity sector is a sector that every ordinary citizen comes into contact with every day, and the technology of clean energy power generation is becoming more and more mature, so the clean energy power sector can be an entry point for ordinary citizens to participate in the carbon market.

2. In what way ordinary citizens can participate in carbon emissions trading

Ordinary citizens can obtain electronic clean power certificates by subscribing to clean energy power, and the clean power certificates can be linked to carbon emission credits or carbon emission targets, and they can exchange the clean power certificates for carbon emission credits for carbon emission trading.

3. How to realize the issuance of clean power certificates

Based on blockchain technology, each clean power production terminal sells clean power and issues the corresponding clean power certificate to the seller.

Features comparison between power trading platforms

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Platform | Pricing Mechanism | Consensus Mechanism | Crypto- Currency | Mining Required |
| NRGcoin | Yes | PoW/PoS | Yes | Yes |
| Sunchain | No | PoW | No | No |
| GridSingularity | No | PoA | Yes | Yes |
| Excrgy | Yes | PoS | Yes | Yes |
| SolarCoin | Yes | PoS | Yes | Yes |
| Pylon network | Yes | PoW | Yes | Yes |
| Power Ledger | Yes | PoW/PoS | Yes | Yes |
| Proposed System | No | PBFT | No | No |

Features comparison between technologies

|  |  |  |
| --- | --- | --- |
| Features | Hyperledger | Ethereum |
|  | Preferred platform for B2B businesses | Platform for B2C businesses and generalized applications |
| Confidentiality | confidential transactions | Transparent |
| Mode of Peer Participation | Private and Permissioned Network | Public/Private and permissionless Network |
| Consensus Mechanism | Pluggable Consensus Algorithm: No mining required | Pow Algorithm: Consensus is reached by mining |
| Programming Language | Chaincode written in Golang | smart Contracts written in solidity(Implements by Golang in ETH2.0) |
| Cryptocurrency | No built-in cryptocurrency | Built-in cryptocurrency called Ether |