A Peer-to-Peer Energy Trading System

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Abstract. Bitcoin innovates our lives. Bitcoin and all cryptocurrencies lead humankind to a brighter new future. **That is why** our project will address the significant environmental issues Bitcoin faces from energy consumption. Our experiment will extend to all other cryptocurrencies. Today, many animals and plants including the Komodo dragons that have existed since prehistoric times, are in danger of being extinct due to climate change. Climate change has and will always have a critical impact on the people living in poverty around the world. Millions around the world are suffering from large financial losses arising out of natural disasters from climate change. What's even worse, our neighbors are losing their beloved families and friends. Climate change is an issue directly related to our survival. Therefore, if cryptocurrency overlooks its environmental issues from energy consumption, it will not be able to maintain its core values or duty to humankind. Our project supports bitcoin with the efforts to overcome its environmental issues so that it can revolutionize our lives and change the future, thereby fostering further cryptocurrency and spread of the value of decentralization across the world.

1. Introduction

This project will be the first experiment in human history where cryptocurrency takes the initiative to respond to climate change and where we perform and succeed in the low-carbon transition. At the same time, the project will support the pioneer's innovative experiments that establish and connect the global native currency of the internet in financial networks in underdeveloped countries, such as Africa. So we will build an open developer platform and the voluntary energy marketplace, making them accessible to anyone who wants to accelerate the world's transition to sustainable energy.

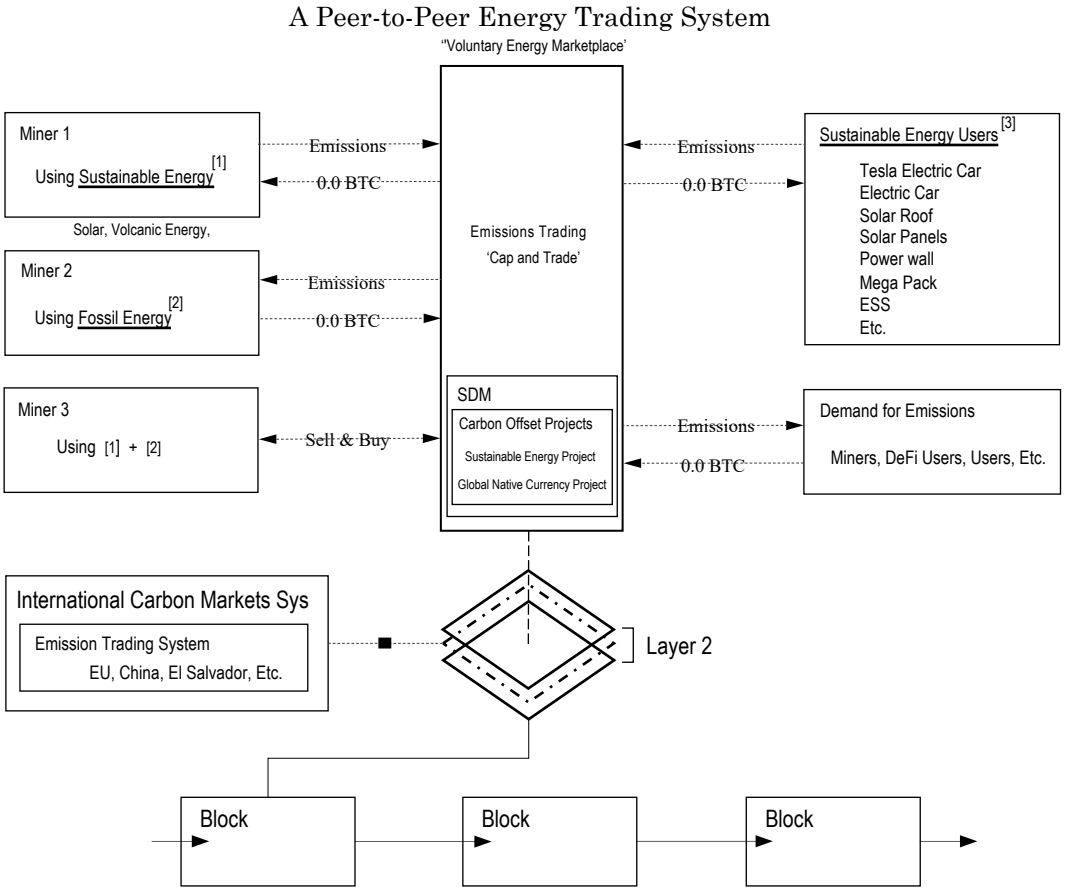
Our experiment will be realized through the voluntary participation of individuals and groups worldwide.

We will dedicate all necessary authorities to the bitcoin community after development is complete. In addition, we will expand our experiment to all cryptocurrencies so that everyone in the cryptocurrency ecosystem can participate.

In this paper, we have defined sustainable energy as a wider concept of renewable energy in line with our philosophy that humanity should turn to sustainable energy as the ultimate source of energy. As numerous papers written by experts and research thesis on the environment including Square's Bitcoin Clean Energy Investment Initiative show various statistics and data, we noted only the essential elements in this paper.

2. A Peer-to-Peer Energy Trading System

Greenhouse gases mix throughout the atmosphere, so reducing them contributes to the overall climate protection. This is why climate change is not only a local issue but a global problem. Therefore, we can address it with carbon emission trading through a voluntary energy marketplace.

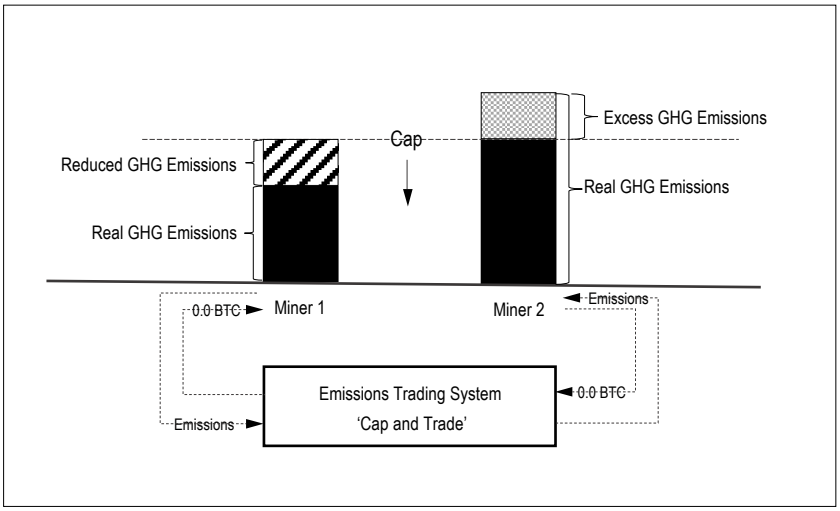


A peer-to-peer version of energy trading system we establish will enable individuals around the world to participate as members in the sustainable growth ecosystem to address climate change. In addition, those participating in our sustainable growth ecosystem who are implementing the transition to sustainable energy will be rewarded through the voluntary energy marketplace.

This experiment is designed to be compatible with the mechanisms of the Paris Agreement and the Kyoto Protocol. This experiment is also designed to be compatible with international carbon markets. The experiment is designed to achieve climate neutrality of 55% or more within 5 years of establishment and 100% within the next 10 years. It is an effort to accomplish a carbon-neutral world by more than 20 years earlier than 2050 as specified in the Paris Agreement.

2-1. Emissions Trading

Emission Trading works on the 'cap and trade' principle. Trading in emissions refers to trade in emission capacity: the right to emit certain volumes of greenhouse gases. Emission Trading System(ETS) refers to the carbon emission trading amongst miners after the emission allowance is allocated for each miner within the cap of the total carbon emission allowed by the community or a third-party non-profit organization certified by the community. The emissions cap is gradually lowered, reducing the total volume of emissions. Within the cap, miners and users buy or receive emissions, which they can trade with one another as needed.

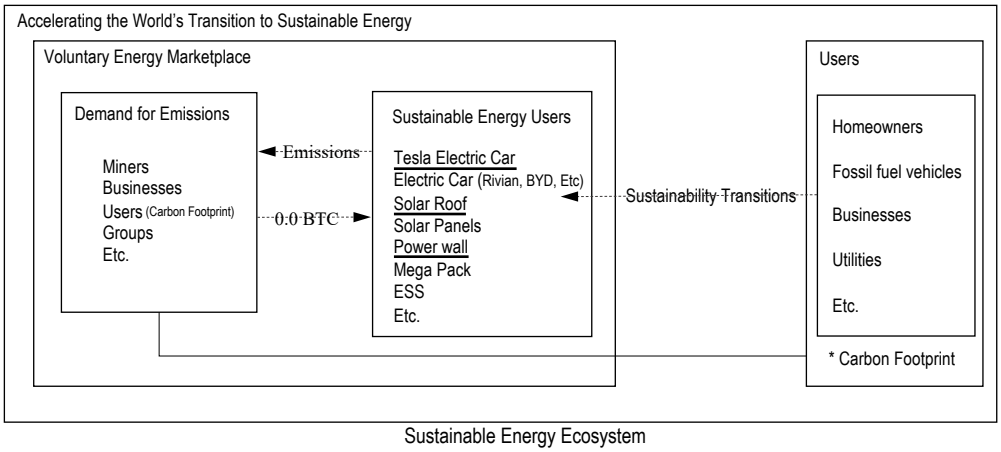


Transactions Among Emitters and Participants

Each of the groups and individuals involved in mining in the voluntary energy marketplace will be allocated with carbon emission allowances. Miners are most likely to have to trade emission allowances with other Miners depending on the type of energy they use for mining. Miners that use renewable energy, for example, will have emission allowances to spare as their greenhouse gas emissions are reduced and will make profits by selling these surplus credits to the voluntary energy marketplace. On the other hand, miners that use fossil fuel energy will have their greenhouse gas emissions exceed the quota and will need to purchase emission allowances, thereby being responsible for their emissions and contributing to the sustainable growth ecosystem. This system will encourage miners and groups to switch to sustainable energy voluntarily, to ultimately help solve environmental problems caused by energy consumption and make positive contributions to climate change. To this end, reliable verification of transition to sustainable energy by miners will be established through the community or a third-party non-profit program certified by the community.

2-2. Sustainable Energy Users [3]

Users who have set up ways to source sustainable energy are given a certain amount of carbon emission allowance when they participate in the voluntary energy marketplace. For example, a user who has purchased and owned an electric car from Tesla and a user who has installed Tesla solar panels or solar wall at his home is part of a sustainable energy ecosystem. So when they decide to participate in carbon trading, they are then given a certain amount of carbon emission allowance. The assessment and certification of the participants' sustainability can be done by the market, the community, or a third-party program that has been vetted by the community. Examples of such certification process may include a purchase certificate issued by Tesla to a buyer of its electric vehicle and a certificate of installment issued to a user who has purchased Tesla's solar panels for his home. There will be some controversy of course. However, the fact that people own electric cars and install solar panels, solar walls, and ESS in their houses means that a change is in progress to turn to sustainable energy and such change is contributing a lot to reducing carbon emission.



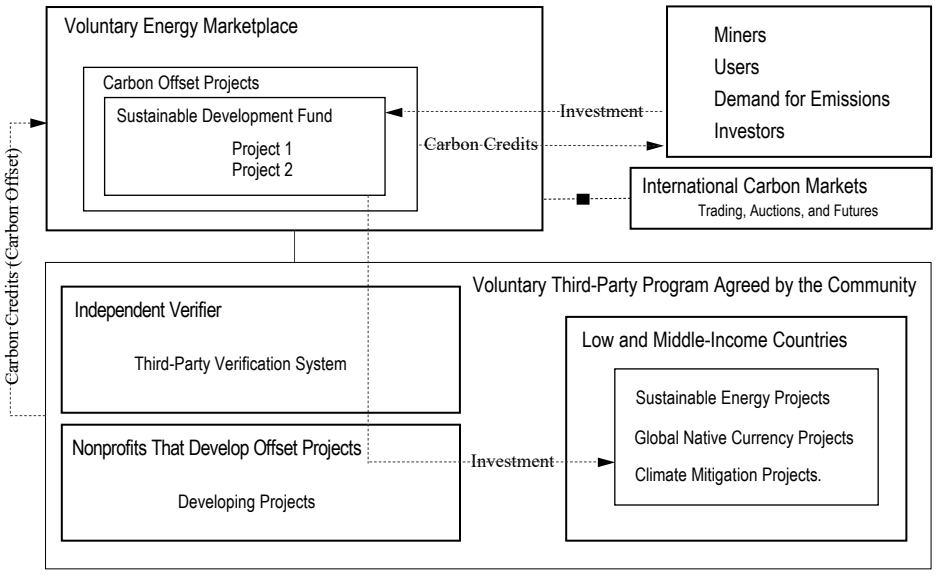
*Carbon Footprint : The global average annual carbon footprint per person in 2014 was about 5 tones Co2eq.
The Nature Conservancy suggests that the average carbon footprint for a U.S. citizen is 16 tons.

Therefore, we can reward those who turn to sustainable energy with more tangible compensation in our voluntary energy marketplace Additionally, we can have the progress made through such transition and its rewards facilitate a healthy flow of trade in the voluntary energy marketplace consistently which in turn will facilitate the international carbon trade market. In the end, our voluntary energy marketplace will attract more people from all over the world to make the transfer to sustainable energy voluntarily which will ultimately help the world achieve carbon neutrality earlier than planned.

The ultimate goal and meaning of our experiment are that we lead individuals around the world to make a positive contribution to climate change through voluntary participation in a sustainable energy ecosystem rather than through compulsory regulation by governments and countries. Indeed, the sustainable energy ecosystem will be firmly rooted in the lives of all those participating in our program across the world.

2-3. Sustainable Development Mechanism

The SDM is a project-based GHG offset mechanism. In the voluntary energy marketplace where voluntary participation and trading are ensured, individuals and groups can invest in carbon offset projects to balance off their carbon footprints. These projects are usually based in less-developed countries like those of Africa and are usually designed to reduce future emissions. What may be included in the project are the introduction of clean energy technologies to convert conventional carbon energy to sustainable one and developing a mature financial system. In particular, developing outdated financial system(e.g., waste of paper and plastics from printing money) into a global native currency system will have a positive impact on the environment as well as on the industries and lives of the people in the underdeveloped countries in the long run. All carbon credits are designed to be confirmed and verified by a voluntary third-party program agreed by the community. This mechanism generates carbon offset credits provided that an emission reduction project meets all verification program requirements, applies an approved project protocol, and successfully passes third-party verification.



Sustainable Development Mechanism

Every individual of the world participating in the voluntary energy marketplace can purchase carbon credits by investing in carbon offset projects. This is a very important cycle in the sustainable energy ecosystem, as it can help individuals or groups to offset the carbon footprints they've created during cryptocurrency transactions, services, and use of other services, for example. In addition, individuals can also buy carbon offset credits to counterbalance air travel emissions. They will offset their carbon footprints by an equal reduction in emissions in other parts of the world in the voluntary energy trade marketplace. Eventually, our experiment will be realized through the voluntary participation of individuals and groups worldwide.

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