

Cryptocurrency Mining: As a Green Energy Drive

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Abstract

In this paper, a new insight of cryptocurrency mining usage related to renewables, reuse of excess heat from mining rigs into heating, drying, energy generation and growing crops in greenhouses as well as defining green-coins are presented. Finally, possible energy harvesting case for boosting mining energy economy and efficiency is suggested for the first time in literature and open web.

As the effects of climate change are increasing, environmental awareness, actions towards energy economy and emission reduction are increasing. Meanwhile, unless renewables are subsidized by government, collaborative projects and feed-in-tariff, implementation of renewable power plants is facing difficulties due to long period of redemption. Cryptocurrency mining is commonly indicated as giant source of energy consumption and one of the greatest sources of resulted greenhouse-gas emissions due to traceable structure based on transparency of blockchain. However, cheap energy is the fundamental step for mining to cover mining costs and generate profit. The chronological shift to receive cheap energy started from: (i) Locating in cold regions to both cool mining hardware and receive cheaper electricity; (ii) to locating in hot regions with solar power plants to achieve self-sustaining energy generating mining farms where the cooling energy is also covered and profit upon mining. Meanwhile, another trend is that (iii) localization of mining farms near renewable power plants. The latter two (ii and iii) opened a new financially sustainable model for renewable energy. Cryptocurrency mining reduced the period of redemption of renewables from 5 years to a year as well as tripling the profit. Additionally, the option (i) is also evolved into: (1) mining rig heaters for households (brands such as Hotmine and Qarnot), (2) novel bio-generation plant, (3) heating greenhouse crops like strawberries and tomatoes ("cryptotatoes") and (4) Canadian well ventilation together with heating greenhouses. Novel bio-generator (2) consumes biofuel, has trigeneration that feeds mining, adsorption unit upon waste-heat and heat pump. Eventually, energy distribution is looped to feed mining, heat the building, cool mining rigs; and mining results in financial profit stem from mining reward, transaction fees and minimized maintenance cost due to efficient cooling. UnitedCorp's BlockchainDome (4) collect rising waste-heat and feed greenhouses via well ventilation. Rejected heat is then exchanged to subsoil which is chilled underground and pumped to cool the mining rigs without the need of fan or air conditioning.

While the green-coin definition started as a metaphor due to cryptocurrency mining empowered by renewable energy sources, green-crop producing sustainable mining models are introducing additional layer for the real meaning of green.

Pioneer application suggestions of this study are: (A) Thermo-electric generator (TEG) implementation on mining hardware (application-specific integrated circuit chips, ASICs) as energy harvesting from cryptocurrency mining; and finally, (B) Desalination of salt water from the waste-heat of mining. Reuse of waste-heat from cryptocurrency mining for desalination and greenhouse heating together would also provide irrigation of the crops in greenhouse. Therefore, fully sustainable profit-making green mining model is projected.

Keywords: Blockchain, Cryptocurrency Mining, Mining Rigs, ASICs, Renewable Cryptocurrency Mining, Green-Coins, Climate Change, Green Mining, Energy Harvesting, Energy Harvesting from Mining