CRYPTO & ESG

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Beneath the ESG label and crypto

Crypto is a history-altering tool for social equality and inclusion

Blockchain technology and crypto are going mainstream with lightning speed. There are many reasons why people are getting involved -- some embrace the concept of decentralisation and others are thrilled with the volatility of an alternative asset class. Some have been attracted by the cute Dogecoin, status-seekers have become obsessed with the Bored Ape Yacht Club NFTs, and more than a few are simply suffering from a bad case of FOMO. Crypto enthusiasts come from a cross-section of society, ranging from millennial tech anarchists to seasoned traditional market professionals.

Ever since Elon Musk's tweet about Bitcoin's electricity consumption, Bitcoin has been wearing a "dirty" hat, a narrative that has been amplified by media and sceptics. In this report, we wish to put crypto's **Environmental** narrative in a more balanced perspective. We also aim to highlight crypto and blockchain technology's contribution towards **Social** and **Governance** factors. We showcase real-life examples of how crypto helps meet numerous UN Sustainable Development Goals (SDG), such as Innovation, Reducing Inequality, Gender Equality, Sustainable Community, Justice & Strong Institutions.

Blockchain is a history-altering technology, enabling solutions previously thought not to be possible, especially from a social equality and inclusion perspective. Crypto is the byproduct of blockchain technology, as for a true market-driven ecosystem to be sustainable, incentives must be provided to the participants. Below is a summary of the relationship.

The relationship between blockchain and crypto

1. **Foundation:** Blockchain is an open-source public ledger on a network that runs on cryptographic consensus that allows trustless transactions. To scale the network and ensure the integrity of the ledger, participants validating transactions on the network are rewarded with additional crypto assets. The first well-known crypto asset was Bitcoin, but thousands more crypto assets have since been created.

2. **Building blocks:** Many blockchains feature "smart contracts," or self-executing digital agreements governed by software code. These smart contracts enable endless use cases, such as providing liquidity, lending and borrowing, and supply chain management. These contracts are executed through payments using the native tokens of that blockchain, so the value of those tokens increase the more people use its blockchain.

1.0 The (E)nvironmental Factor

Proof of Work (PoW) consensus requires computing power to ensure network security and to record transactions. The Bitcoin network has grown to such a scale that immense amount of computing power is now used to secure the network. This is both a feature and a bug. It is a feature as it means the Bitcoin network is probably the strongest network in the world, secured and maintained by thousands of independent people globally. It is a bug as unfortunately some of this computer power is run on electricity produced by burning coal.

The crypto community recognizes this shortfall and the criticism has hastened a move to Proof of Stake (PoS) consensus, which is much more energy efficient. A common misconception is that crypto uses a lot of electricity, and is therefore bad for the environment. We break down the elements of this simplistic approach, explaining why one can critically compare crypto's environmental impacts against those in the broader economy.

1.0 Energy consumption

- **PoW mining share of renewables is the key to determining the environmental impact -** "*This question has undoubtedly sparked a lot of heated debate since Bitcoin has come under public scrutiny for its enormous energy consumption on par with that of whole nations. The energy mix plays a vital role in finding a conclusive answer to this question. Until additional and better data on the network's power mix become available, strong assertions on either side of the debate should be considered with caution.*"

  <div align="right">Cambridge Centre for Alternative Finance</div>

- **Bitcoin can use energy that other sectors cannot** - Bitcoin miners are "energy nomads," quickly flocking to regions where electricity supply is greater than demand. For example, before China's mining ban, miners would move to Sichuan province to tap into the excess electricity production during wet season, then head to Northern provinces where electricity is heavily subsidised. In North America, Bitcoin mining has been powered by gas flaring from oil extraction, turning the undesired byproduct of a polluting industry into a valuable commodity. Bitcoin mining isn't necessarily competing with other industries and residential users. Instead, Bitcoin mining can monetise "stranded" energy.

- **PoW mining close to energy production sources is a highly efficient use of energy -** around 61% of electricity is lost during transmission from the point of production to the point of use? Bitcoin mining nomads are known to directly tap into energy at the point of production, rather than consuming electricity via the regular grid, saving a significant amount of carbon emissions.

- **Bitcoin energy use compared to gold** - According to the University of Cambridge, the gold mining industry uses around 30% more electricity than Bitcoin does per year. There's simply no comparison between Bitcoin's lifetime energy consumption with that of the gold industry during the same time period. We should also note the detrimental environmental and labour impact of gold mining outside of its electricity use, such as polluting water and land and displacing communities.


Bitcoin

99.79

TWh per year

Gold mining

131

TWh per year
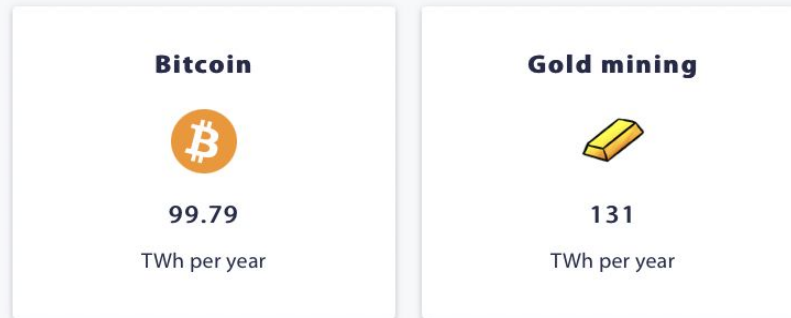
Source
Mudd, G., Global trends in gold mining: Towards quantifying environmental and resource sustainability (2007), 2019 est. based on own calculations

Note: energy intensity estimates of gold mining on a global scale are difficult to verify and can vary considerably. This figure is based on an older estimate from 2006 which may not be representative of the state of the gold mining industry today. It nevertheless provides a useful input for modelling a simple baseline scenario that assumes little infrastructural upgrades in gold mines over the last decade.

- **Proof of Work (PoW) vs Proof of Stake (PoS)** - Bitcoin is only one of thousands of crypto assets. The industry is developing rapidly, and solutions for maintaining network security while reducing the computational power to validate transactions have been developed. Non-PoW consensus mechanisms are becoming the dominant consensus mechanism (by market cap), and they use a fraction of the electricity of PoW networks like Bitcoin. PoW is a diminishing share of the crypto market and will likely fall to around 40 per cent of the overall market once Ethereum 2.0 launches, probably early next year.

- **Green mining -** Growing ESG focus has already led some crypto mining companies to actively incorporate sustainability goals into their business strategy. For example, Iris Energy, an Australian-headquartered company, owns and operates a Bitcoin mining operation in rural communities of British Columbia, Canada. Its new mining data centre is powered by renewable energy and it supports local First Nations people and creates long term jobs, meeting Decent Work and Economic Growth and Sustainable Communities goals (UN SDG).
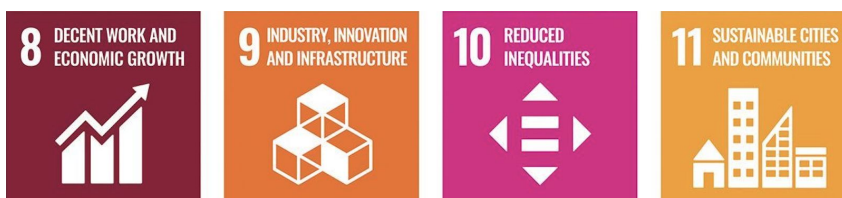
2.0 The (S)ocial Factor

Everyone is equal in the crypto world
Positive Social Impact

A research report from <u>Stanford University</u> highlighted case studies from 193 organisations where crypto and blockchain are making tangible social impacts. It covered a range of industries, initiatives and projects -- health care, agriculture and philanthropic aid management, among others -- that have already begun to demonstrate social impact.

We also see a significant social impact in financial applications, which we discuss below.

2.1 Financial Inclusion

1. **Unbanked population**: Over <u>2 billion people</u> are unbanked, often because their data is not held in traditional sources, or they lack formal identification. Via a smartphone, crypto can provide many of these people with access to basic financial services.

2. **Gender-neutral**: The majority of these unbanked are women. Providing women a means to access financial inclusion has a meaningful impact on equality.

3. **Permissionless**: Crypto can allow anyone with a smartphone to participate in Decentralised Finance (DeFi). Once only the domain of regulated financial institutions, activities such as borrowing and lending, market-making, futures have become open to everyone on a peer-to-peer basis.

4. **True equality**: Every participant is equal in the ecosystem, regardless if they are a billionaire or a refugee. Any individual can participate in the crypto ecosystem.

5. **Cost-efficient**: Crypto can lift vast numbers out of poverty by giving them access to global markets through cheaper remittances services. The current financial system makes it extremely costly to send money back home. In South Africa, traditional financial intermediaries charge a whopping 8% to send US$200.

2.2 Case Study: Increasing Efficiency of Philanthropy

Traditional aid programs have faced limitations in addressing problems affecting the economic infrastructure of communities in need. Much of the aid flows out of local economies too rapidly to have a lasting effect. Finally, many vulnerable communities may not have access to currencies, or their local currency is not sufficiently stable to use as a medium of exchange.

In Kenya, the Red Cross is pioneering Community Inclusion Currencies (CICs). CICs are blockchain-based eVouchers that community members use to buy and sell basic needs in the face of scarce national currency. CICs aim to eradicate poverty by creating connected, inclusive and sustainable local economies through community currencies and open-source blockchain technology.

The Red Cross can monitor the economic transactions on the blockchain and use this data to direct aid communities that are most vulnerable.

Initial studies indicate that the blockchain-based CICs have been 21 times more impactful than direct cash fund transfers.
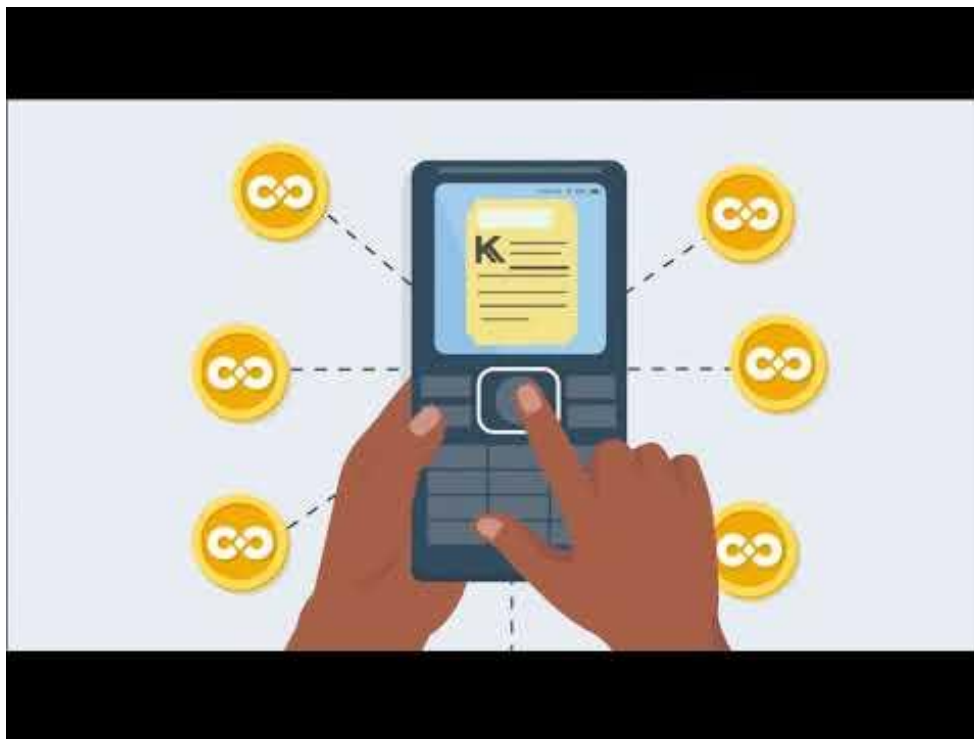
3.0 The (G)overnance Factor

**Objectivity is the beauty of crypto & blockchain
Code is Law**

Although there's no denying that the permissionless nature of crypto has enabled some forms of criminal activity, this has seen the whole crypto industry "tarred with the same brush." Numerous studies have shown that only a tiny amount of crypto transactions are illicit. As our objective is to provide a balanced view, we'd like to emphasize the positives that have been largely ignored. Blockchain technology could be the best tool to combat corruption, increase transparency and promote the efficient governance.

3.1 Crypto Governance vs Corporate Governance

Economic systems have been built upon corporate entities and legal frameworks that have served a purpose, but are subject to many limitations and shortfalls. Crypto assets can redefine the governance structure and effectiveness of organisations.

1. **Code is law vs legal ambiguity -** Under the existing corporate legal framework, there is a significant degree of ambiguity. This results in corporate entities and individuals heading to courts because of a lack of clarity of contractual conditions. Crypto assets and economic activities undertaken on blockchains are subject to the black and white nature of smart contracts. For example, if condition A is met, then action B is executed by the smart contract without corruption or ambiguity. The code is law.

2. **Inclusiveness of tokenholder rights** - The governance of a protocol is clearly defined, as is the process required to make changes. Many DeFi projects are governed via governance tokens, with all governance votes being transparent and visible on the blockchain. Governance tokens can be used to coordinate a community with the core protocol contributors and ownership of these tokens being permissionless and globally accessible. Governance tokens can also be easily distributed to users of the protocol to incentivise further network participation.

3. **Transparency and disclosure** - Each protocol is different, but the code is generally open source and every transaction that has ever happened can be viewed by anyone. There is not the opacity of black-box trading in traditional financial markets. Nor is the decision-making process shrouded in secrecy by a limited number of company insiders.

3.2 Blockchain Promoting Public Governance

Moving one step beyond crypto, the World Economic Forum has identified how blockchain technology can help promote better public sector governance and further meeting the UN Sustainable Development Goals:

1. **Public Procurement** - Government vendor selection processes are opaque and rely on a large degree of human discretion, which is the most significant source of corruption. Blockchain-based methods can provide an objective and transparent selection process.

2. **Land Title Registries** - Not only can blockchain be used to improve the efficiency of land title transactions and management, but in many countries, it can potentially provide a secure, decentralised, publicly verifiable and immutable record system.

3. **Beneficial Corporate Ownership Registries** - The aftermath of the Panama and Pandora papers and the widely reported use of blind trusts has highlighted the need for corporate ownership transparency. Opaque or undisclosed ownership can be used to pay bribes, launder money, or exert political influence. Using a blockchain, companies can develop registries to better track ownership, identify conflicts of interest, and improve transparency.

4. **Grant Disbursement** - The process of government grants disbursement is open to corruption, but blockchain technology can be used to disintermediate the number of actors involved and improve the transparency of how funds are used.

The Bottom Line

Crypto and blockchain unlock tremendous potential for ESG.

A simplistic narrative leads many to dismiss crypto as poor on the Environmental, Social and Governance issues because of exaggerated concerns about Bitcoin's energy consumption. It's important to realise that Bitcoin is just one of many crypto assets, it is not that bad on energy consumption (although it does need to improve) and crypto scores very well on Social and Governance factors. As our report has showcased, crypto has many use cases to help fulfil numerous UN Sustainable Development Goals.

	Blockchain & Crypto ESG Scorecard
E	+ Bitcoin mining < gold mining + Increasing proportion of renewables energy source + PoS and Layer 2, 3 solutions reduce energy consumption - Some coal-powered mining still occurring
S	+ Inclusion of unbanked population + Empowering women with access to finance and markets + Permissionless - open to all sections of society + Apolitical + Affordable remittance costs + Digital identity (political or climate refugees) + Philanthropy and aid distribution + Healthcare, food safety, agriculture applications - Lack of regulation with some bad apples
G	+ Code is law + Token-holder rights protected and executed by code + Corporate governance structures that are clearer than legal frameworks + Tackle corruption by increasing transparency of government spending + Land title registries/Electronic voting protected from manipulation - Scalability of private blockchains - Privacy coins may be used for Illegal activities

About the author:
Cici Lu is a Senior Portfolio Manager at Pilgrim Partners Asia (Pte.) Ltd. Cici has over 10 years institutional banking experience in FI & FX trading, and has been a proponent of using blockchain to enable UN Sustainable Development Goals. She recently took on a mission leader's role advocating blockchain applications in philanthropy with the Association of Family Offices in Asia. Disclaimer: The views expressed here are solely those of the author in her private capacity and do not in any way represent the views Pilgrim Partners Asia (Pte.) Ltd nor its principal officers.