

Introduction

Question 5 concerns the impact of blockchain on sustainability. This is really a complex question. One of the fundamental drivers in relation to sustainability in all areas is the age old issue of the Tragedy of the Commons. This issue is holding back sustainability efforts as individuals independently behave against the common good (i.e. sustainability) out of their own self-interest. One of the fundamental potentials of blockchain is its ability to align individual incentives with collective group incentives.

There are really two parts to the question of blockchain and its potential contribution to sustainability. These are

1. Blockchain allows efficient, novel processes which are not possible without blockchain
2. Blockchain may consume significant energy resources in facilitating these processes

Novel processes

There are many novel ways in which blockchain can help sustainability. These include:

- Management of Decentralised energy grids
- Supply chain transparency
- Facilitate EV finding charging stations so encouraging use of EV
- Use of on demand drivers without a gig economy
- facilitating peer-to-peer energy transactions
- Peer-To-Peer Investments for Sustainable Energy Infrastructure such as a [Security Token Offering \(STO\)](#) on the blockchain. Security tokens can bring much-needed immediate capital to sustainable energy projects particularly in countries where the Government may not be supportive of such investments
- Direct Energy Payment Channels where blockchain can be an entirely separate financial system for energy payments.

Significant energy resources

- Blockchain has a recognised problem for using significant amounts of energy. The primary cause for this reputation is extensive use of Proof of Work consensus methodology. This issue has become very well known as it is the methodology used by bitcoin, which is also widely used with bitcoin mining undertaken on a very large scale
- Solution: Move from proof of work to proof of authority or proof of stake or some newer methodologies. Two of those are
 - Algorand which claims transactions result in a significant reduction in emissions compared with Bitcoin and
 - Red Belly which is a radical new approach using concurrency from Australia which claims transaction speeds around 600,000tps
 - Powerledger which has recently moved to Proof of Stake Energy Chain that allows for 50,000 tps

Regulatory Impediments

There are also some regulatory impediments which are slowing the potential use of blockchain technologies. The principal ones of these are :

- Regulatory bodies lack an understanding of blockchain
- Bitcoin and Ethereum have given blockchain a bad name. Bitcoin is volatile and risky and consequently regulators view any blockchain application as volatile and risky
- Status of smart contracts. The legal framework for regulating smart contracts is still evolving
- Confusion over the relative merits of private and public blockchain networks

Conclusion

Blockchain technology has significant potential to improve sustainability – the challenge is constructive progress in its use and reducing energy intensiveness.

