What the Heck is Blockchain Technology?

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Presentation Outline

• About NCSEA

• How Blockchain Works

• Misconceptions and Concerns About Blockchain

• Connection Between Energy & Blockchain
Who is NC Sustainable Energy Association?

Founded in 1978, the NC Sustainable Energy Association is a 501(c)(3) non-profit membership organization of individuals, businesses, government and nonprofits interested in North Carolina's sustainable energy future.

*NCSEA drives policy and market development to create clean energy jobs, economic opportunities and affordable energy to benefit all of North Carolina.*
What Is Blockchain?

• Distributed and open network that allows different parties to verify transactions with one another

• Next level of the Internet of Things which will revolutionize way we exchange value without third parties (i.e., financial institutions)

• Security through encryption technology

• Consists of series of connected blocks, where each block has:
  • A hash
  • Data
  • The hash of the preceding block
What Is Blockchain?
How Does Blockchain Work?

There are four distinct steps:

1. A member of the network enters a transaction

2. Details of the transaction are sent to the other members of the network

3. If the network members verify the transaction, it is approved

4. After it is approved, a new block with the transaction details is added to the most recently created block
Misconceptions & Limitations of Blockchain

• Bitcoin is an application of blockchain, but blockchain is its own technology

• Blockchain has unclear regulatory authority which is difficulty in regulated markets such as banking and utilities

GREAT SCOTT!

New study quantifies bitcoin’s ludicrous energy consumption

Bitcoin could consume 7.7 gigawatts by the end of 2018.

Nobody Knows Exactly How Much Energy Bitcoin Is Using

New research suggests that Bitcoin will account for 0.5 percent of the world’s electricity demand by the end of this year. But one researcher says he still isn’t getting the whole picture.
Energy & Blockchain

• Allows people to trade energy between themselves like Venmo for money transactions

• Creates a local renewable energy market that allows extra energy to be sold to others through peer to peer trading eliminating the middle man
Example:
Blockchain will coordinate EV and consumer battery charging and discharging in Germany and the Netherlands

Energy & Blockchain Cont’d

Example:
Better tracking of renewable energy credits

https://www.greenbiz.com/article/blockchain-bluster-and-beliefs
Energy & Blockchain Cont’d

Example: Peer to peer energy sales

In a posh Bangkok neighborhood, residents trade energy with blockchain

Energy & Blockchain Cont’d

Share of blockchain initiatives in the electric power sector

Global, as of July 2018

- Peer-to-peer transactions: 36%
- Grid transactions: 24%
- Energy financing: 12%
- Sustainability attribution: 11%
- Electric vehicles: 11%
- Others: 6%

Adapted from Livingston et al., 2018, "Applying Blockchain Technology to Electric Power Systems"; Chart: Axios Visuals

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