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# Bitcoin Mining & Energy

September 18, 2024





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# Bart Gnirk

- BSC Cybersecurity Student
- Went down the Bitcoin rabbit hole in 2020
- Founded the Bitcoin Research Club Fall 2023
  - Club President
- Former Helpdesk Security Analyst for Swan Bitcoin
- Started local meetup - Bismarck Bitcoin

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# What does the BSC Bitcoin Club do?

Study  
Bitcoin!

Bitcoin 101  
Presentation

Volunteering

Conference  
Trip

Club Fair

Stranded  
Screening

Mystician  
interview

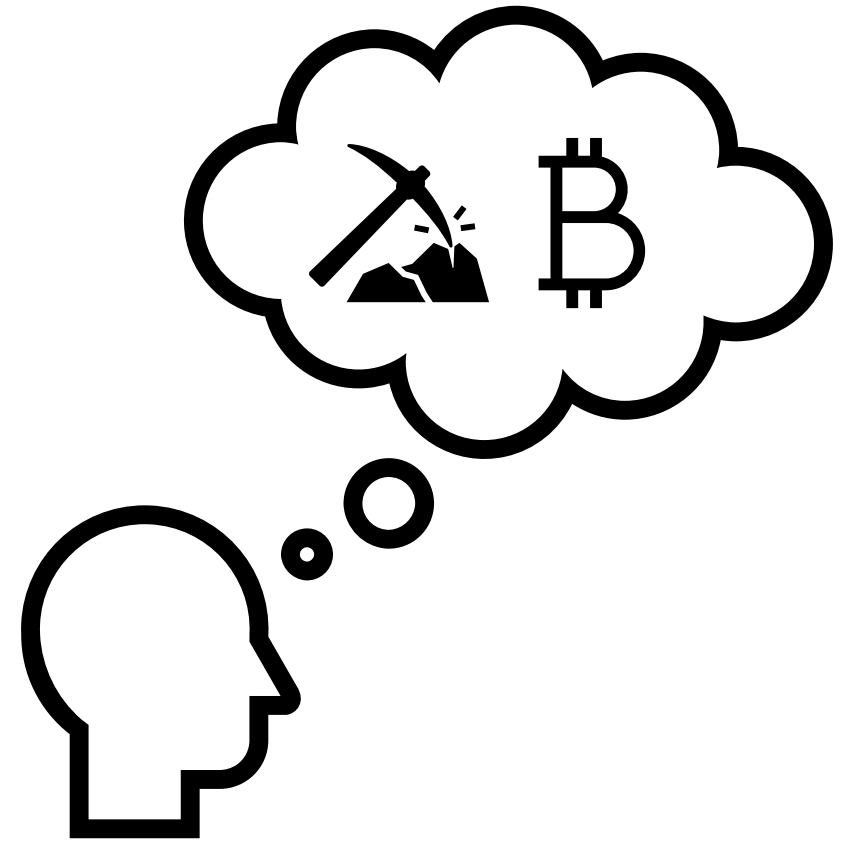
Financial  
Literacy week

Bitcoin  
Students  
Network



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# Why does Bitcoin Mining use Energy?

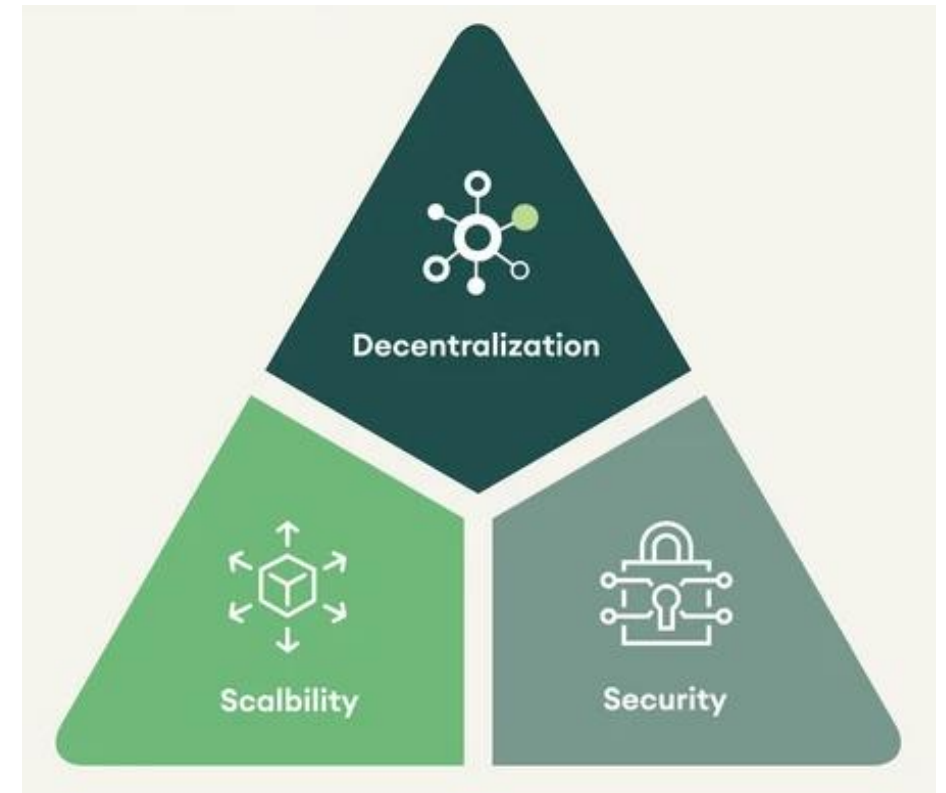


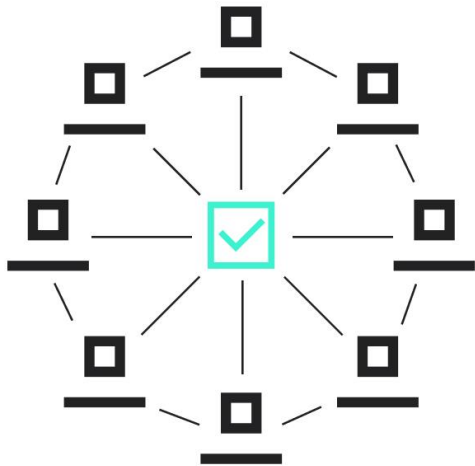


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# Bitcoin Mining Requires Energy

- Bitcoin mining requires energy for security
- Proof-of-Work algorithm necessitates energy consumption
- Energy trade-off for decentralization and security





Decentralized Consensus



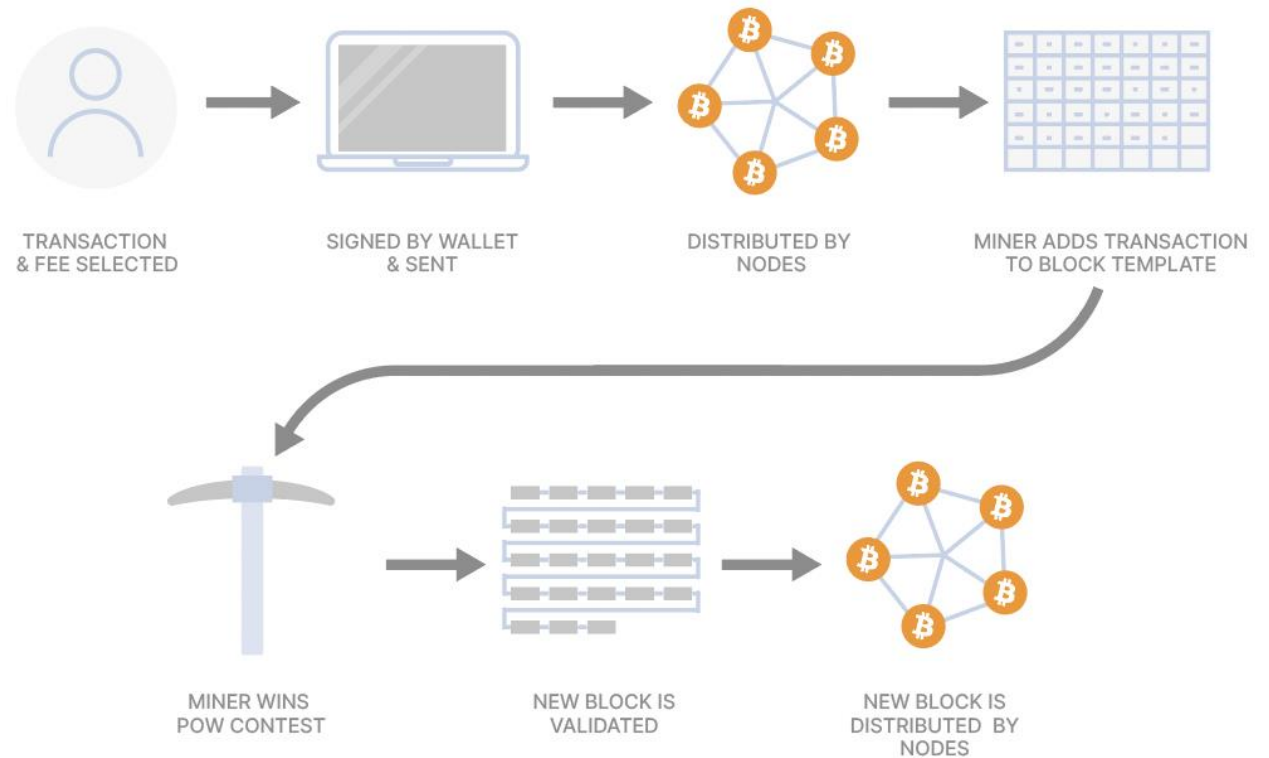
Centralized Consensus

# Proof-of-Work

- Miner creates valid block to be compensated
- Network detects rule violations
- No need for trust between participants
  - Consensus Mechanism

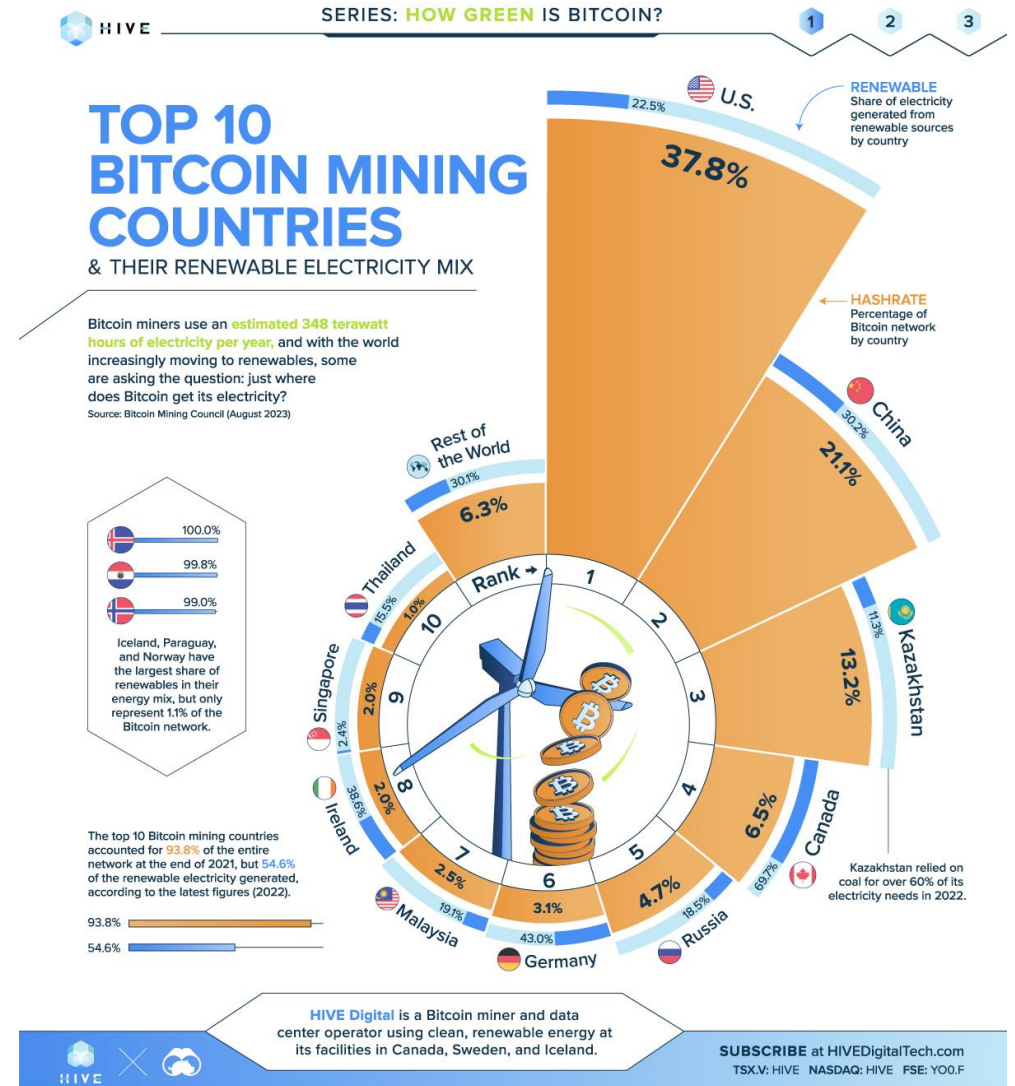
# What if Miners try to cheat?

- Nodes detect invalid transactions
- Cheating miners lose reward
- Investment wasted if miner cheats



# Renewable Energy

- Bitcoin mining: 58.4% renewable energy (Q1 2022)
- Cheaper renewables in remote locations
- Bitcoin miners have relocation flexibility



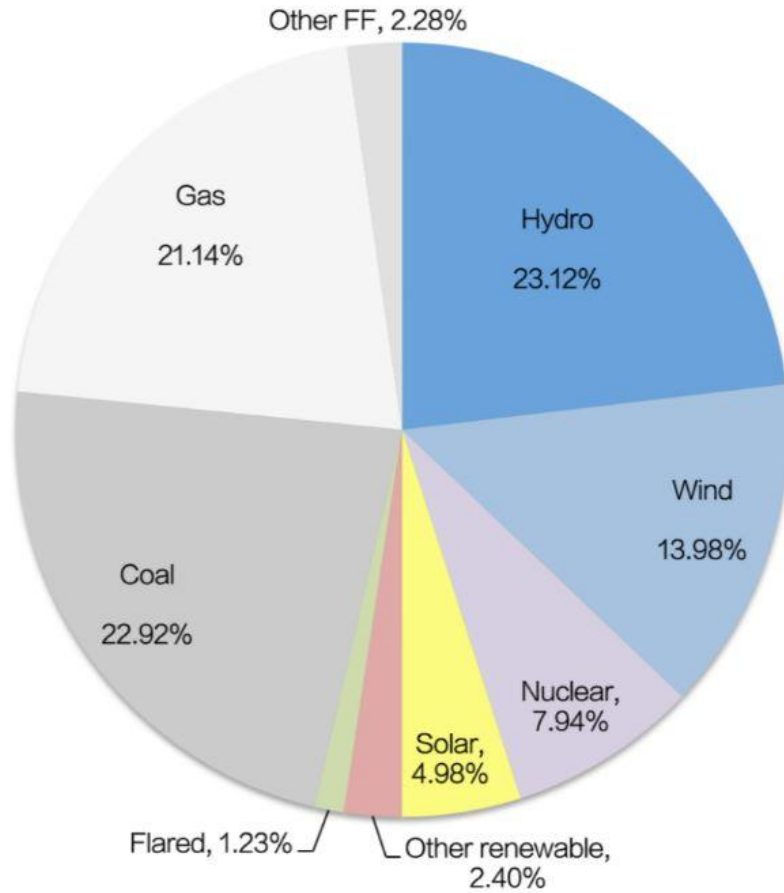
Sources: Cambridge Centre for Alternative Finance (as of Dec. 2021), Ember (2022)

(1) A country's total hashrate represents the aggregate computing power attempting to solve Bitcoin's proof-of-work puzzle. (2) Ember includes hydroelectric, bioenergy, solar, wind, and 'other renewables' in their calculation of renewable electricity share; as of 2022. (3) The Cambridge Centre for Alternative Finance uses geolocal data from several Bitcoin mining pools to estimate the country-level breakdown of the network.



## Bitcoin Energy Sources

source: batcoinz.com / @dsbatten



This pie graph is dynamic and reflects the network as of 30 March 2023. Changes in hashrate, power consumption, and mining activity will impact overall percentages.

## Energy Sources for Mining

- Flared-gas
- Landfill methane emissions
- Coal-based energy
- Solar
- Wind
- Hydroelectric
- Geothermal
- Nuclear



## Texas paid bitcoin miner Riot \$31.7 million to shut down during heat wave in August

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# Enhancing Energy Grids

- Boosts energy providers' income
- Strengthens grids for near-max capacity
- Funds upgrades and improves balance sheets
- Solves community energy problems
- Miners can quickly shut off as needed

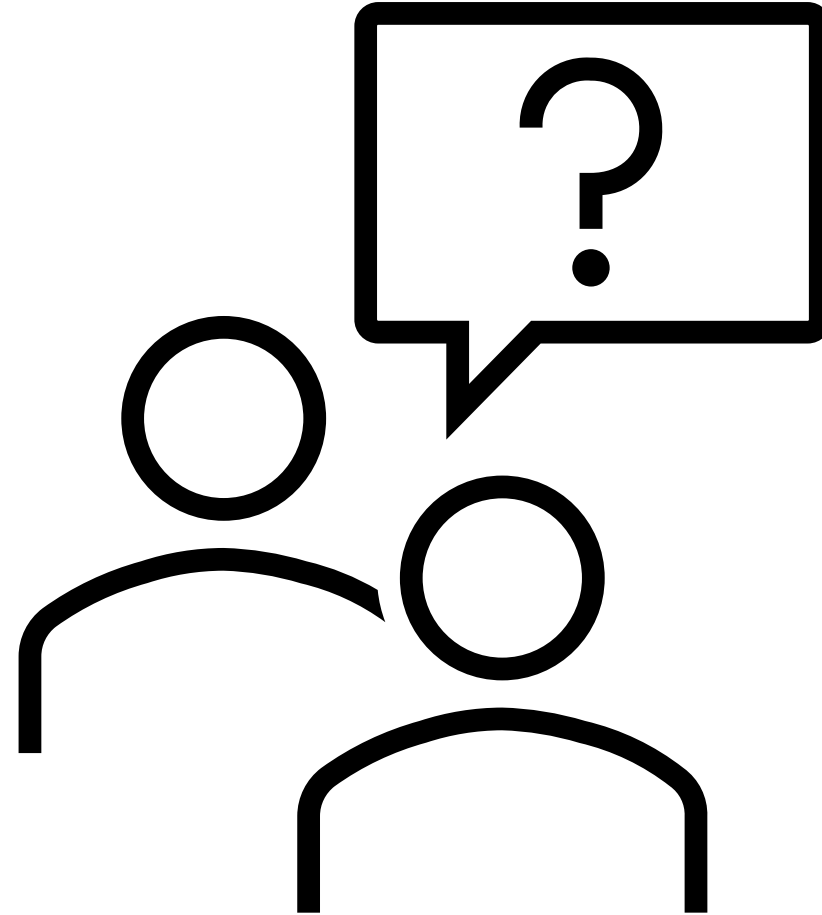


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## Key Takeaways

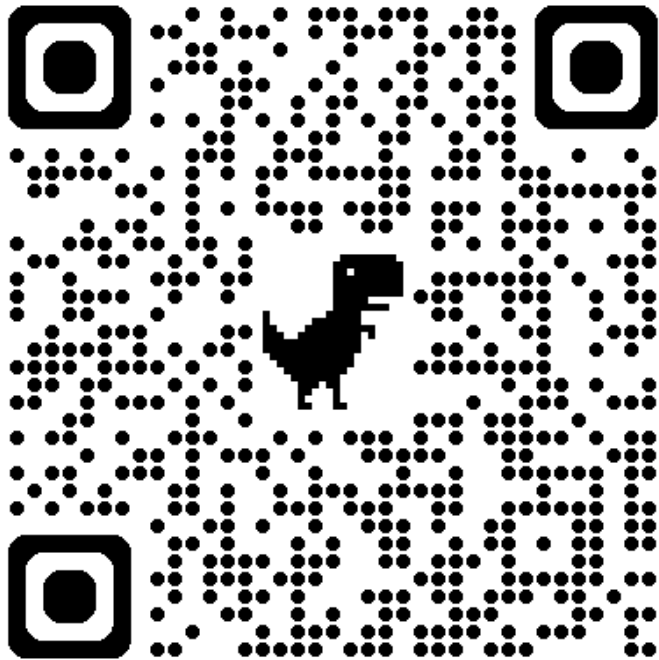
- Bitcoin secures transactions via energy consumption
- Energy cost deters bad actors
- Uses renewable energy and can strengthen grids
- AI and Bitcoin mining: A symbiotic relationship for the digital age

# Questions



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# Monthly Bitcoin Meetup



**BISMARCK**  
**BITCOIN**  
BITCOIN LIGHTBULB MOMENT



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# Thank you!

