

# The Fiat Standard – Lecture 16 (Bitcoin and Energy Markets) • Study Notes

## Introduction

This lecture addresses one of the most misunderstood and controversial topics in Bitcoin: **its relationship with energy**. Ammous argues that Bitcoin mining is not wasteful, but rather the most efficient and peaceful way to anchor monetary truth. Proof-of-Work (PoW), backed by electricity, provides consensus without rulers, eliminating the violent “proof-of-work” of fiat—wars, political struggles, and coercion.

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## Fiat vs. Bitcoin Consensus

- **Fiat system:**
  - Value is politically determined.
  - Governments and central banks arbitrarily assign or confiscate wealth.
  - Control of the ledger requires political power, maintained through war, coercion, and violence.
  - “Proof-of-work” in fiat = **military might and political dominance**.
- **Bitcoin system:**
  - Value anchored in physics via proof-of-work.
  - No authority can change balances without private keys.
  - Consensus emerges automatically through the expenditure of electricity and mining hardware.
  - Cheating is impossible because invalid blocks are **expensive to produce but cheap to reject**.

**Key insight:** Fiat spends energy destructively (wars). Bitcoin spends energy constructively (securing consensus).

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## Proof-of-Work & Difficulty Adjustment

- PoW requires miners to solve mathematical puzzles (hashing).
- Nodes verify solutions cheaply; miners bear the costly work.
- **Difficulty adjustment** ensures:
  - Blocks are mined every ~10 minutes.
  - Supply issuance remains predictable regardless of demand.
  - Mining profitability always hovers near equilibrium with energy costs.

**Implication:** Bitcoin is the only liquid commodity with a **perfectly inelastic supply**.

- Increased demand does not increase supply (unlike gold, oil, or fiat).
  - Instead, demand increases the network's **security** (higher hash rate).
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## Energy: Scarcity and Abundance

- **Energy is not scarce in absolute terms.**
  - Solar input in 1 hour > total human yearly consumption.
  - Wind power  $\approx$  4x human usage.
  - Hydroelectric  $\approx$   $\frac{1}{3}$  of global consumption.
  - Hydrocarbons & uranium are effectively abundant.
  - The **scarcity lies in converting and delivering energy** as power when/where needed.
  - Energy is a **human product**, not a fixed endowment.
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## Bitcoin's Unique Energy Demand

1. **Portable buyer of energy:**
2. Can monetize stranded or wasted energy.
3. Needs only an internet connection, not wires or pipelines.

4. **Waste energy consumer:**
  5. Mines where energy has low opportunity cost (flared gas, remote hydro, unused nuclear capacity).
  6. Turns waste into monetary value.
  7. **Constant drive toward cheapest energy:**
  8. Difficulty adjustment ensures only miners with the lowest costs survive.
  9. High-cost miners are culled in bear markets.
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## Implications for Energy Markets

### 1. Mining on Waste Energy

- Stranded hydro, flared methane, excess geothermal, or curtailed renewables.
- Converts unused energy into economic value.

### 2. Incentivizing Energy Generation

- Bitcoin creates **global demand for cheap, reliable power**.
- Encourages capital investment in energy infrastructure.
- Unlike fiat subsidies for unreliable sources (wind, solar), Bitcoin incentivizes **efficiency and reliability**.

### 3. Reliability vs. Intermittency

- Miners prefer 24/7 uptime to maximize ASIC usage.
- Solar/wind (intermittent)  $\approx$  uncompetitive for mining.
- Hydroelectric, nuclear, and flared gas  $\approx$  highly competitive.
- Analogy: Running modern grids on wind/solar is like forcing cars to be pulled by horses part-time.

### 4. Future of Bitcoin Energy

- **Unlikely:** Grid-connected hydrocarbon plants (opportunity cost too high).
- **Likely:**
- Remote hydro dams.
- Nuclear plants with excess capacity.
- Flared/stranded gas operations.
- Abandoned oil fields.

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## Fiat Fuels vs. Bitcoin Fuels

- **Fiat fuels:** Subsidize unreliable renewables, destabilize grids, raise costs.
- **Bitcoin fuels:** Reward cheap, reliable energy, strengthen grids, lower marginal costs.
- Bitcoin effectively **redirects seigniorage away from governments** toward productive energy investment.

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## Conclusion

- Bitcoin does not “waste” energy—it **redirects it toward peaceful consensus.**
- Fiat’s proof-of-work is war; Bitcoin’s proof-of-work is computation.
- Mining ensures that only low-cost, reliable energy is monetized.
- Over time, Bitcoin will:
  - Incentivize abundant, reliable power.
  - Consume waste and stranded energy.
  - Demonopolize energy markets globally.

**Final insight:** Bitcoin transforms the world’s energy markets from tools of war into engines of prosperity.

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