

Market Notes: Bitcoin... a battery, a bond, a lifeboat?



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Bitcoin is a battery. Bitcoin production transforms energy into a store of value that can be transferred to a future use in time. Bitcoin is a bond. Evaluating bitcoin production also reveals that bitcoin cash flows can be transformed into a bond – even a green one. Not bad for a bunch of math. Bitcoin's value as collateral is underutilized.

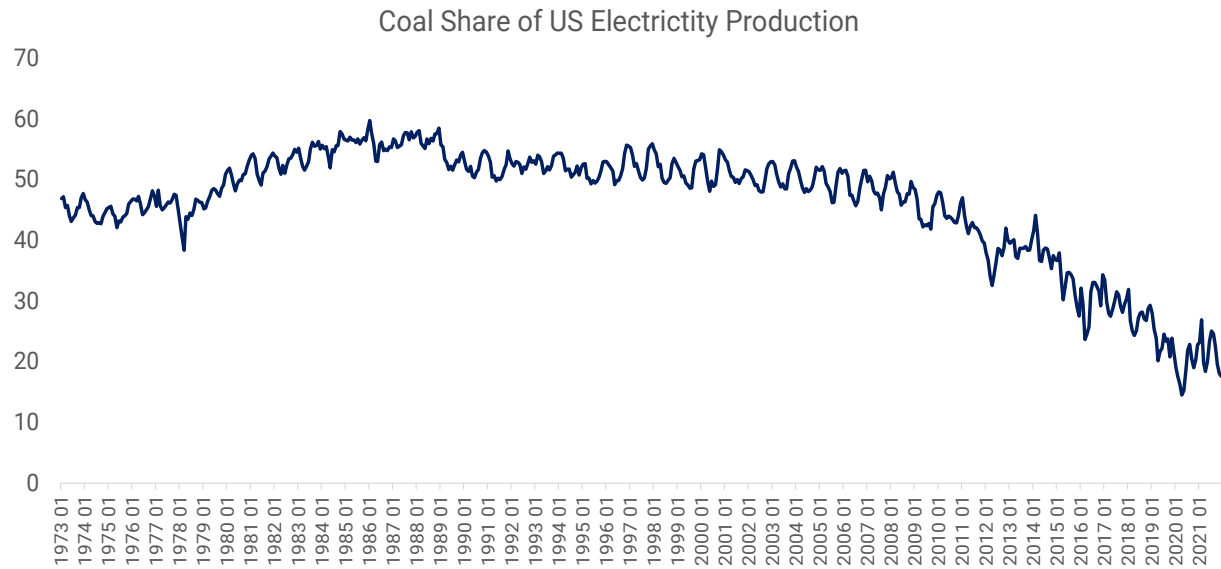
Marcel Kasumovich
(Head of Research)
and Doug Wilson
(Portfolio Manager),
One River Digital

1. One of the most controversial elements of the Bitcoin protocol is the energy it consumes through its proof-of-work mechanism. Bitcoin's proponents are unapologetic about this feature, reasonably. Its energy consumption is the surety of its security. For opponents, there is great excitement about the [reduction in energy usage](#) with Ethereum soon migrating to proof of stake and hopes that Bitcoin can make a similar pivot. After all, reducing energy consumption by 99%, as will happen with Ethereum, is attractive. Realistically though, it is not going to happen with Bitcoin, at least not in the near future.
2. Bitcoin is built around decentralization in the purest sense. Nobody is in charge. This also informs potential changes to the protocol. Anyone – regardless of credentials – can submit a [Bitcoin Improvement Proposal](#) to change the core protocol. It requires the appropriate formatting, code implementation for the proposed changes, and 95% mining support over the equivalent of 14 days. It is not only that Bitcoin's energy is its key feature, but also that a complete proposal for change would require immense investment. The bar for change is exceptionally high.
3. This is all by design, not a flaw. It may very well limit the roles that Bitcoin can play in the future digital ecosystem. And yet, the market still ascribes to bitcoin the highest asset-value in the ecosystem, based on the security and reliability of the protocol. Store of value is at the core of financial intermediation. Bitcoin has been up and running [99.99%](#) of the time since its launch and more than 3,300 days without downtime. In the past 24 hours, more than [270 thousand transactions](#) will have cleared the Bitcoin network, at a value of around \$40 billion. All from a protocol built around incentives and trust in math. It is working.
4. On the other hand, Bitcoin is also inefficient. The inefficiency of the Bitcoin protocol is the foundation of its durability. Take the sudden stop in mining activity in China last year. The computational power used by Bitcoin network fell by more than [50% in May 2021](#) without any loss of service. It is inconceivable to imagine such a shock to any industrial activity without an interruption in output. Bitcoin had none. Of course, this highlights the redundancies in its design. The global economy cannot, and should not, be redesigned to such a protocol. Not everything needs such redundancy. But it makes perfect sense for the gold standard of the digital ecosystem.
5. The friction and frustration with potential adverse consequences of new technologies are to be expected. The standards set for a new generation are always higher than the ones before it, evidenced in the grandfathering of fire codes in homes. We know better, and we demand better. Bitcoin advocates should expect and welcome the scrutiny. It is a sign of relevance. Inconsequential ideas are the least scrutinized. Bitcoin is consuming nearly [16 gigawatts](#) (GW) of power a day, equivalent to a small, rich country. It also defies ordinary context – 160 million ordinary lightbulbs running for an hour, or 507-times the number of streetlights in New York City. It is natural to shine a light on the issue.
6. Bitcoin proponents are not blind to the obvious, nor are they dismissive. Several organizations, including the [Green Bitcoin Project](#), are focused precisely on solutions. They are looking beyond the connection between energy consumption and carbon emission. The electrification of the economy imagines a world where power is led by renewables. It is a current megatrend in the United States that has been reinforced, not derailed, during the rise in bitcoin usage. Twenty years ago, coal accounted for 51.5% of [US electricity generation](#); ten years ago coal fell to a 39.6% share; it was 17.6% at the end of last year (Figure 1). The electrification of finance will do no more to interrupt this trend than the electrification of cars. It may help accelerate it.
7. The positive externality of Bitcoin is shortchanged. The inability to effectively store electricity means that electricity supplies must have substantial redundancy, like Bitcoin. Production is geared to satisfying peak demand. As a result, the average utilization rate of electricity is 40-60% over a year (Figure 2). The redundancy in electricity production is subsidized in one way or another, such as with the [Production Tax Credit](#). During

periods of limited power demand, it is routine (and profitable) to sell power at negative rates to earn the tax credit from production. The mobility of bitcoin production makes it uniquely positioned to utilize excess energy production. It improves the incentives to invest in renewable energy.

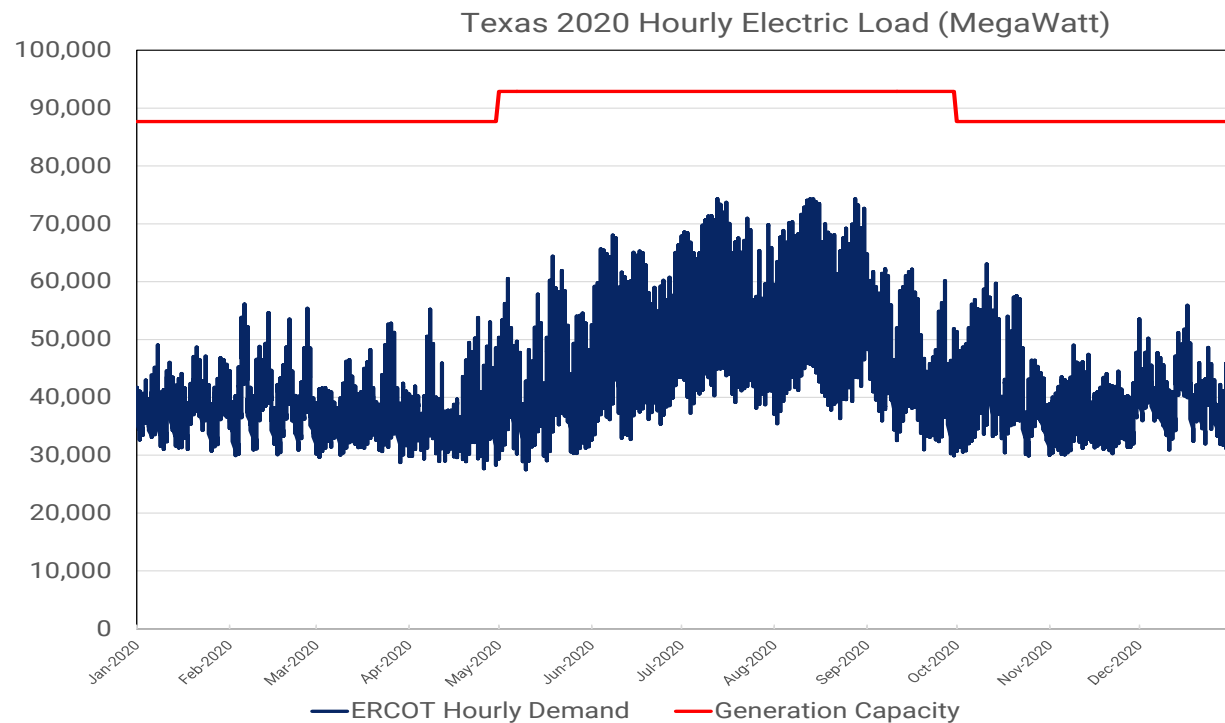
8. Bitcoin's mobility is distinct from almost any other energy-intensive production. It is common for redundancy in energy to be harnessed for commodity manufacture. Iceland utilizes geothermal and hydro power to refine aluminum, an indirect way of exporting its comparative advantage in cheap, green electricity. But bitcoin production is far more flexible – it can be done in small batches through shipping containers that can be redeployed with relative ease, compared to the infrastructure of commodity mining. It is the argument for bitcoin as a battery – energy is transformed to a store of value that can be used at a future point in time. Bitcoin is like a battery.
9. Global electricity consumption is going to rise and rise by a lot with or without Bitcoin. The United States per capita electricity consumption is nearly four-times the global average and more than twelve-times that of India. Raising India's per capital electricity consumption to one-quarter that of the United States would add 11% to world electricity consumption alone. Innovation will emerge from the supply side because it must. And it is incentives for investment – just like the incentives that run the Bitcoin protocol – that will drive innovation. It is the sweet spot for Doug Wilson, Portfolio Manager, who brings a wealth of knowledge on the power sector to our digital income and credit strategies. He sees the cash flow characteristics from bitcoin production as a fixed income investment (Figure 3).
10. Think of bitcoin production as a “digital bond”. The key to any mining operation is its ability to access energy. Leveraging redundancies is ideal, and these are often in renewables. It is not an academic exercise, either. Doug is hunting for these redundancies on the ground and testing the efficiency of mining operations in-house. One River's digital bond is part of the solution to Bitcoin's energy observations – capital provision to enhance the efficiency of electricity production that offers a strong, real return to yield-starved portfolios. In the transition to renewable energy production, we are shining a bright light on the bitcoin carbon issue by systematically estimating and valuing the [cost of offsets](#). As capital moves to monetize the value of Bitcoin's mobility, that footprint is headed to zero in our view.

Figure 1: Megatrend Away from Coal



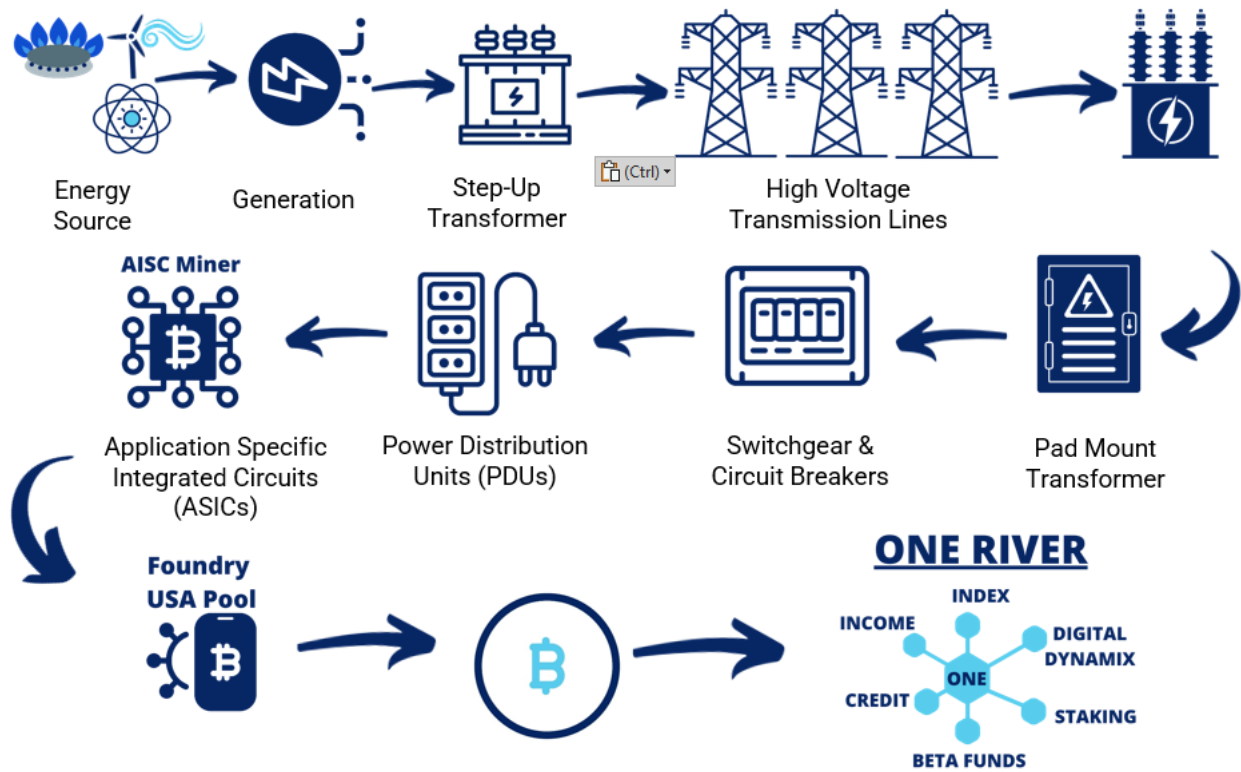
Source: US Energy Information Administration, One River Digital Calculations.

Figure 2: Redundancy is the Norm in Electricity Production



Source: Electric Reliability Council of Texas.

Figure 3: Making Bitcoin Makes Financial Products



Source: One River Digital.

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ONERIVERDIGITAL
ASSET MANAGEMENT

w: oneriveram.com | e: info@oneriveram.com

3 River Road, 2nd Floor, Greenwich, CT 06807

NFA ID: 0461647 | FINRA: 167835