



Legislative Resource

VERSION 2

BITCOIN & BITCOIN MINING

WHAT LEGISLATORS NEED
TO KNOW

January 2025



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Introduction

The digital asset sector, characterized by rapid growth and innovation, is reshaping the global monetary system and various industries. At the forefront of this transformation is Bitcoin, the pioneering digital asset, which boasts a market capitalization in the hundreds of billions of dollars. Recognized globally as both a store of value and a method of payment, Bitcoin's impact is profound and far-reaching.

The United States has played a significant role in Bitcoin's exponential growth, with substantial involvement in both the financial and mining sectors of Bitcoin. These industries have not only created thousands of jobs and billions of dollars in value but have also seen widespread participation from the public, with about two in ten American adults owning cryptocurrency in 2024¹. Bitcoin's versatility is evident in its usage, spanning from purchases of goods and services to money transfers, enhancing privacy, and safeguarding the long-term purchasing power of its holders.

Despite its burgeoning presence, the federal government has not yet established a comprehensive regulatory framework for Bitcoin and digital assets.

This leaves states with a pivotal role in fostering innovation and providing regulatory clarity. State policies have been instrumental in defining digital assets, enabling traditional financial institutions to interact with these new asset classes, and supporting the burgeoning field of Bitcoin mining.

This document serves as an essential guide for state lawmakers, elucidating the fundamentals of Bitcoin and Bitcoin mining.

Legislators reading this may be surprised about the potential of Bitcoin and Bitcoin mining. In fact, more peer-reviewed research is sorely needed to help show this value.²

This guide offers a range of policy recommendations aimed at promoting the Bitcoin ecosystem and mining activities within states. The guide outlines both straightforward and intricate policy options, catering to varying levels of Bitcoin and digital asset engagement across states.

With the implementation of these policies, even states that have not traditionally been leaders in the Bitcoin and digital asset space can position themselves to attract significant job opportunities and economic growth, leveraging the potential of this innovative and rapidly evolving sector.



A Bit About Bitcoin

Bitcoin, created in 2009 by an enigmatic figure or group known as Satoshi Nakamoto,³ has become the most prominent cryptocurrency in the world. Its establishment marked a significant shift in the concept of money, introducing a digital currency that operates independently of traditional financial systems.

Bitcoin's decentralized nature is a fundamental aspect, distinguishing it from traditional currencies. It functions as a peer-to-peer digital currency, free from the control of any central bank or governmental authority. This decentralization with the use of a distributed ledger technology known as the blockchain, and is secured by Proof-ofWork (also known as Bitcoin mining).

The innovative transaction management system of Bitcoin is a key feature. Transactions are processed over a network of computers, each contributing to the maintenance and security of the network. These transactions are compiled into blocks and added to a continuous chain, forming the blockchain. The blockchain's design ensures that all transactions are publicly recorded and immutable, providing a high level of security and resistance to tampering or fraud.

When conducting a Bitcoin transaction, a user authorizes it with a private key, which functions as a digital signature. This transaction is then broadcasted to the network. Once verified by the network's participants, known as miners, the transaction is added to the blockchain, and the Bitcoin is transferred to the recipient's wallet.

A unique aspect of Bitcoin is its limited supply, capped at 21 million coins. This finite supply contrasts with traditional fiat currencies, which can be printed at will by governments, potentially leading to inflation. Bitcoin's scarcity and predetermined release schedule make it an attractive option for those seeking a hedge against inflation or currency devaluation.

Bitcoin's global adoption is growing steadily. It has seen a notable milestone in El Salvador, where it was adopted as legal tender, a first for any country. Estimates suggest that approximately 10% of internet users worldwide between the ages of 16 and 64 own some form of digital asset, indicating the increasing popularity of cryptocurrencies.⁴ As more people and nations embrace Bitcoin, integrating it into their financial systems and supporting its mining infrastructure, they stand to gain significant advantages in the evolving digital economy.



Bitcoin Mining Makes It Work

Bitcoin operates without a central authority, so the task of processing transactions falls to a group known as Bitcoin miners, functioning similarly to decentralized data centers.

These miners use powerful, specialized computers called Application-Specific Integrated Circuits (ASICs) to maintain the Bitcoin network. The primary task of these ASICs is to find the answer to a complex computational problem, a process akin to a competition among numerous computers on the network. Successfully finding the answer to the problem allows miners to process transactions, thereby creating the next “block” in the blockchain.

The operation of Bitcoin miners is heavily energy-dependent, with the cost of electricity greatly influencing the profitability of mining. To optimize profits, miners have adopted various innovative strategies. Some use surplus energy, like flared natural gas or excess electricity from solar and wind farms, which would otherwise be wasted because they can't be fed into the electrical grid.

A notable aspect of Bitcoin mining is its ability to scale down energy usage rapidly, a feature stemming from the network's decentralized nature. If miners in a particular region stop operating, it doesn't significantly impact the network's overall health, and Bitcoin transactions proceed as usual. This contrasts with traditional data centers, where an outage can disrupt services like Netflix for many users.



Credit: Riot Blockchain

This flexibility in energy management is a distinct characteristic of the Bitcoin mining industry. Moreover, Bitcoin mining has catalyzed innovation in the broader data center sector, particularly in cooling technologies. Traditionally, ASICs were cooled using high-powered fans, which were not only energy-intensive but also noisy. To overcome these challenges, miners have adopted immersion cooling technology, where the equipment is submerged in a non-conductive fluid. This technique has proven so efficient that it's now being integrated into conventional data centers.



Energy Benefits

The U.S. now a leader in Bitcoin mining, exceeding about 30% of global activity, though numbers can shift dramatically over short periods of time. This shift has benefited the U.S. in job creation, and energy infrastructure enhancement.

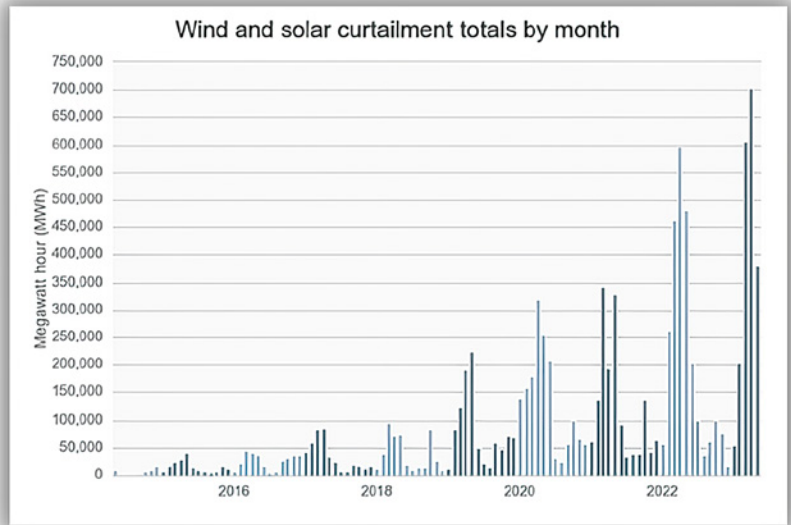
Bitcoin mining's adaptability to energy supply and demand dynamics is significant. Miners purchase excess energy and can rapidly reduce consumption during grid stress, helping to stabilize prices and prevent blackouts. In Texas, known for its competitive energy market, this synergy is especially evident.

Texas Bitcoin miners profitably utilize surplus energy, which would otherwise be wasted. During energy shortages, they can cut usage by over 90% almost instantly, aiding in lower power costs for Texans and reducing reliance on expensive alternatives.

During Winter Storm Elliot in 2022, BTC miners wound down roughly 1,500 MWs of power. Enough to heat 1.5 million small homes.⁵

This model isn't unique to Texas; Bitcoin mining helps balance grids elsewhere by managing energy surplus and scarcity, thus improving grid reliability and supporting energy production expansion.

Notably, the California Independent System Operator (CAISO) curtailed 2.4 million Megawatt Hours of wind and solar generation in 2022, highlighting the potential for Bitcoin mining to utilize this otherwise wasted energy.⁶ By assisting in managing energy abundance and scarcity, Bitcoin miners enhance the reliability of energy grids and promote the expansion of energy production across various regions while ensuring rates stay low for the average consumer.



CAISO continues to break curtailment records year over year



Environmental Benefits

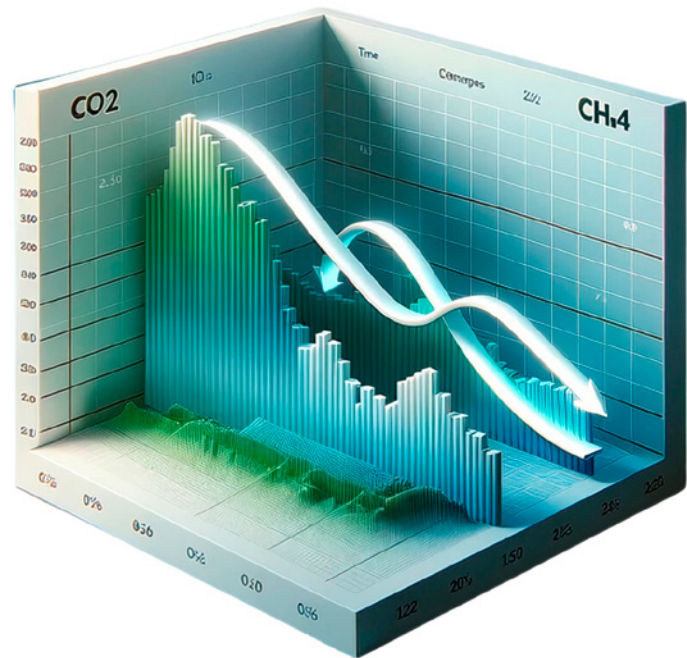
Methane, a potent greenhouse gas, is often released during oil drilling operations and through the decomposition of biomatter. In some scenarios, methane can be efficiently transported via pipelines for use in businesses or homes. However, there are situations where constructing such infrastructure is impractical.

In these instances, methane is either released directly into the atmosphere, contributing to the greenhouse effect, or flared, meaning it's burned off. Both practices are environmentally detrimental — venting increases greenhouse gases, and flaring represents a wasteful disposal of methane's energy potential.

Bitcoin mining offers a novel solution to this environmental challenge. Due to the mobility and flexibility of Bitcoin mining operations, they can be set up virtually anywhere, including at sites where methane is otherwise vented or flared. By capturing this methane, Bitcoin miners can convert it into electricity to power their ASICs.

This approach not only curtails the release of greenhouse gases but also harnesses the otherwise wasted energy, creating economic value from a resource that would have been discarded.

To expand on its potential, miners can also act as a load balancer for renewable and carbon-free energy projects. As wind and solar come online they often times create excess generation that goes unused. Miners can use that excess generation, but also wind down when there is less generation from renewables. This ensures full utilization of green energy projects while simultaneously ensuring that miners curtail when supply is low so that ratepayers have reliable access to energy.



Bitcoin Mining is a Powerful Tool For The Environment



Economic Benefits



Job Growth & Investment Into Local Communities Increases

Bitcoin mining extends beyond its technological and energy-related contributions, significantly bolstering economic growth and wealth creation, especially in regions with favorable conditions for substantial investments. States like Texas, Kentucky, and Georgia have witnessed investments of tens of millions of dollars in the mining industry. Meanwhile, Ohio, Arkansas, Nebraska, and North Dakota are experiencing notable growth in this sector. The United States now hosts nearly a dozen publicly traded Bitcoin mining companies, providing employment to thousands.

A key economic impact of Bitcoin mining is its tendency to generate jobs in rural areas, often struggling with employment and economic opportunities. This trend is driven by the miners' pursuit of cost-effective power sources and the prevalent location of stranded energy— energy that is available but not consumed due to a lack of local demand — in these less-populated regions with infrastructure left behind by the offshoring of manufacturing.

Regarding employment statistics, jobs in Bitcoin mining facilities offer an average wage of around 31 dollars per hour.⁷ This rate not only surpasses the national average wage but is significantly higher than typical earnings in rural areas. Additionally, many of these mining facilities provide job training, expanding the pool of individuals qualified for these positions and further enhancing the economic benefits to local communities.





Political Concerns About Bitcoin and Bitcoin Mining

Despite Bitcoin being a non-state digital currency, government regulations significantly impact the industry. The role of state governments in regulating various aspects of Bitcoin-related activities is crucial.

Buying Bitcoin

The majority of Bitcoin purchases occur through centralized exchanges. These exchanges are subject to regulatory requirements, including obtaining a money transmission license in 49 states.⁸ States like New York, California, and Louisiana have implemented additional licensing requirements for these exchanges. Regulations imposing extra costs without enhancing consumer protection can hinder the broader adoption of digital assets.

Banking

While Bitcoin serves as a medium of exchange, standard financial obligations like paying employees and electricity bills are typically settled in dollars. Previously routine banking activities for Bitcoin companies have become challenging. Recent directives from federal banking regulators have led to banks severing ties with clients involved in Bitcoin and other digital assets, driven by fears of regulatory actions. Here, state-level banking policies might offer alternative solutions for these companies to fulfill their financial operations.

Bitcoin Mining

Attitudes towards Bitcoin mining vary across states and localities. Concerns about its energy consumption and noise production have sparked opposition. A notable instance is New York, which enacted a two-year moratorium on Bitcoin mining operations that don't use renewable energy sources.⁹

This stance in New York has influenced political perspectives on Bitcoin mining at both federal and local levels.

The Biden Administration proposed a 30 percent tax on electricity used in Bitcoin mining, regardless of the emissions level of the energy source.¹⁰ Similarly, many local governments have imposed moratoriums or outright bans on Bitcoin mining, primarily citing energy use and noise pollution concerns.





What States Can Do to Lead in Bitcoin and Bitcoin Mining

In the absence of a comprehensive federal framework for regulating digital assets, individual states have assumed the responsibility of establishing their own regulatory guidelines. This includes defining digital assets in state law, setting regulations for businesses dealing with digital assets, and governing Bitcoin mining practices. As typical with state-level legislation, approaches vary significantly across the country.

New York, a pioneer in cryptocurrency regulation, introduced the BitLicense in 2015. This regulatory framework was an early acknowledgment of the potential and risks associated with digital assets. However, the BitLicense has faced criticism for its high compliance costs and restrictive nature, with only thirty-three companies having received it as of 2024. New York's recent two-year moratorium on Bitcoin mining has further strained its relationship with the digital asset community.¹¹

Conversely, Wyoming, despite its smaller population and less developed traditional financial sector compared to New York, has emerged as a leader in the digital asset domain. In 2020, Wyoming established a select committee on blockchain, financial technology, and digital innovation technology. This committee's recommendations, often converted into law, have bolstered Wyoming's position in the digital asset industry. Additionally, the state's rich natural gas resources have made it an attractive location for Bitcoin miners.

Many states occupy a middle ground between these two models, with some providing basic definitions of digital assets or virtual currency, while others have yet to address the matter.

Regardless of a state's plans for incorporating digital assets or Bitcoin mining into their economy, it is crucial for state lawmakers to provide legal clarity for businesses and individuals within their jurisdiction. Establishing baseline definitions and regulatory frameworks is essential. Furthermore, states with an energy mix conducive to profitable Bitcoin mining should consider policies that protect the industry. These policies could facilitate innovative approaches to balance the electrical grid, harness stranded energy, and stimulate job creation in rural areas.



Policy 1: Create Definitions Around Digital Assets and Related Technology

Before Bitcoin's advent, there was little need for states to define concepts like virtual currency or digital assets. However, with approximately two in ten Americans now owning some form of digital asset, it has become crucial for states to determine how these assets are classified and regulated. In addition, hosts of additional activities and devices around Bitcoin and digital assets are now coming into widespread usage which are also important to define.

Several key questions arise around the definitions of digital assets . First, should digital assets be treated as personal property or more like financial instruments such as cash or stocks? This consideration affects how they're handled legally and for tax purposes. Second, is there a need to differentiate between types of digital assets? For instance, should virtual currencies like Bitcoin be regulated differently than non-fungible tokens

(NFTs)? Third, do certain digital assets qualify as securities, subjecting them to a different regulatory regime? All of these questions should be addressed directly in definitions of digital assets.

Additionally ancillary technologies around digital assets are important to define. These include technologies such as "digital asset wallets" which let companies or individuals take ownership of digital assets as well as what qualifies as digital asset mining businesses or what classify as merely a hobby.

In the U.S. federalist system, it's imperative for states to collaborate and align their approaches to digital assets. Disparate state-level regulations can complicate the operation of cross-state digital asset businesses, potentially leading to uneven service availability across states. Uniformity in defining and regulating digital assets and related technologies will facilitate smoother operation of such businesses and ensure broader access to digital asset services for consumers.

Takeaways for state lawmakers

- ◆ The increasing ownership of digital assets by Americans necessitates state-level clarity in defining and regulating concepts like digital assets and digital asset wallets.
- ◆ States must consider how to classify digital assets and whether digital assets with different kinds of uses should be regulated under different regimes.
- ◆ For consistent and efficient cross-state operations of digital asset businesses, states should collaborate to align their regulatory approaches, avoiding disparate regulations that could hinder business operations and consumer access.



Policy 2: Create A Legal Framework for Bitcoin Miners

The U.S. has become a major player in Bitcoin mining due to China's ban on Bitcoin activities, and America's access to affordable and reliable energy. However, this leadership position is now under threat from a series of legislative proposals at federal, state, and local levels, which pose a significant challenge to the future of the industry in the U.S.

The main concerns which have emerged over Bitcoin mining are over energy usage and noise pollution.

Addressing these concerns can be done simply and clearly to provide regulatory clarity for this emerging industry and allay worries from constituents.

Foremost, Bitcoin mining can curtail energy usage faster than any comparable industry. Simply requiring that miners have a system to do so in times of grid emergency, in return for some economic benefit, is a win for the energy grid, ratepayers and Bitcoin miners.

For noise concerns, lawmakers should create clear rules for different types of zoning designations. The amount of noise generated in an industrial area should be different than those generated in commercial or agricultural areas.



Takeaways For State Lawmakers

- ◆ The U.S. has risen as a Bitcoin mining leader due to China's ban, leading to a significant influx investment in the United States.
- ◆ U.S. Bitcoin mining faces challenges from energy and noise concerns.
- ◆ Bitcoin miners can be required to participate in curtailing energy usage during grid emergencies.
- ◆ State lawmakers should create fair zoning rules for Bitcoin mining to allay concerns about noise and create easily understandable rules of the road for where and how Bitcoin miners can operate.
- ◆ Implementing these strategies is vital for the U.S. Bitcoin mining industry's growth and sustainability.

Policy 3: Allow Tax and Fee Payments in Bitcoin

One of the main functions of a government is to bring in revenue through taxation and fees. In previous generations, payments were done via check and are currently often done via bank transfers or services such as PayPal.

As digital assets such as Bitcoin are becoming a larger percentage of payments for everyday goods and services, many Bitcoin holders are looking to pay for their government services in Bitcoin. States can create mechanisms to accept Bitcoin, or even other digital assets such as stablecoins, as payment.

Such payment programs are not novel as Ohio, Colorado, and Louisiana have all accepted digital assets for payment in taxes and fees, with Louisiana recently accepting Bitcoin over the lightning network for a hunting license.¹²

States which want to move this direction have a variety of options to accept Bitcoin for payment of taxes and fees. The easiest is partnering with a digital asset payment company to manage the process. However, states which wish to build out their own systems can do so with easily available tools such as business accounts from digital exchange companies or even self-hosted wallets.

Despite the forward thinking approach of the states accepting Bitcoin and other digital assets as payment, these systems have often immediately converted the digital assets to dollars.

As both nation states and American states are exploring the idea of holding Bitcoin as a reserve asset, states should consider keeping all Bitcoin tax payments in its native form and holding it in the general or rainy day fund.

Takeaways For State Lawmakers

- ◆ As digital asset payments become more commonplace, states should look to integrate these technologies as additional payment methods.
- ◆ States have a variety of technical solutions to accepting payments from partnering with companies to managing the technology themselves through self-hosted wallets.
- ◆ States should consider waiving any applicable capital gain taxes for payments in digital assets to incentivize payments to the state.
- ◆ States may want to hold Bitcoin in general funds or rainy day funds rather than immediately converting it to dollars.



Policy 4: Protect Self Custody and the Ability to Spend Bitcoin

Fraud and scams are major concerns in the digital asset world, often involving Bitcoin exchanges misrepresenting their storage of users' Bitcoin. To counter this, individuals can hold Bitcoin directly, transferring it from exchanges to their personal wallets. This self-custody approach reduces reliance on third parties, thus decreasing the risk of fraud. State lawmakers can play a vital role in this process by affirming and legally supporting individuals' rights to self-custody digital currencies.

The use of Bitcoin for daily purchases is increasingly attractive, thanks to technological improvements like the lightning network. However, regulatory challenges, particularly in tax reporting, persist. Currently, Bitcoin transactions are subject to capital gains or losses reporting, which can be cumbersome for regular, smallscale transactions.

To address this, lawmakers could consider introducing a De Minimis exemption for Bitcoin or other digital asset transactions. This would allow small gains or losses from digital assets used in everyday spending to be treated similarly to minor foreign currency transactions for tax purposes. Such a measure would ease the tax compliance burden for individuals using Bitcoin for routine purchases.

Supporting the right to directly hold and spend Bitcoin not only fosters innovation in the digital currency space but also offers better protection for consumers against fraud and scams. By implementing these changes, lawmakers can promote a safer and more user-friendly environment for digital asset transactions.

Takeaways For State Lawmakers

- ◆ Fraud is a key concern in digital assets, often involving Bitcoin exchanges misrepresenting users' holdings.
- ◆ Self-custodying Bitcoin, moving it from exchanges to personal wallets, reduces third party risks and boosts fraud protection, a practice that can be supported by state lawmakers.
- ◆ Bitcoin's use in daily purchases is hindered by regulatory challenges, particularly in tax reporting for capital gains or losses.
- ◆ Implementing a de minimis exemption for small Bitcoin transactions could simplify tax compliance, treating them like foreign currency transactions.
- ◆ Safeguarding the right to own and use Bitcoin encourages innovation and protects against fraud, enhancing consumer rights and freedoms.
- ◆ Promoting the right to hold Bitcoin and establishing a de minimis exemption may increase its usage for state transactions.



Policy 5: Improve Electrical Grid Balancing Programs

Electricity grid balancing programs, commonly referred to as ancillary services, are essential for electricity grid operators, especially with the growing integration of renewable energy sources. The variability of renewable energy sources like wind and solar, which are not constant 'on demand' power sources, creates unique challenges in energy management.

Renewable energy sources often produce power during periods of low demand or insufficient grid capacity to transmit the energy. Conversely, there can be times when their power generation is inadequate to meet high demand. This demand has only increased with the advent of new artificial intelligence data centers which also consume large amounts of electricity.

To address these fluctuations and maintain grid stability, some states have adopted "demand response" programs. These programs involve voluntary reduction of energy usage by consumers during peak demand periods, such as during heatwaves. Demand response is a strategic alternative to relying on more traditional, often emissions-intensive power generation methods during times of high demand.

The development and implementation of these programs typically fall under the jurisdiction of state Public Service Commissions, which regulate energy markets. Policymakers are encouraged to innovate and adopt such programs to enhance grid reliability and reduce costs for consumers. These programs represent a proactive approach to managing the evolving dynamics of energy supply and demand, particularly as renewable energy sources become increasingly prevalent.

Takeaways For State Lawmakers

- ◆ Ancillary services are essential for managing the variability of renewable energy sources like wind and solar, which aren't constant power sources.
- ◆ Renewable energy can either overproduce during low demand or underproduce during high demand, posing grid management challenges.
- ◆ Some states have "demand response" programs, where consumers voluntarily lower energy usage during peak times, providing an eco-friendly alternative to traditional power.
- ◆ These programs help stabilize the grid and reduce reliance on high-emission energy sources during peak demand.
- ◆ State Public Service Commissions, which regulate energy markets, are key in developing and implementing these grid-balancing initiatives.
- ◆ Policymakers should create and support such programs to enhance grid reliability, cut energy costs, and lessen the need for new, infrequently used infrastructure.
- ◆ By minimizing reliance on high-emission power sources during peak demand, these programs also help lower grid emissions.



Endnotes

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