

Grid Games: Evaluating the Impact of Cryptocurrency Mining on ERCOT's Demand Response Programs and Consumer Equity in Texas

Shray Tapiawala*

This Article explores the implications of cryptocurrency mining on Texas's electricity grid, particularly through the Electric Reliability Council of Texas's (ERCOT) Load Response and Responsive Reserve Services programs. As China enforces stricter mining regulations, Texas has become a hotspot for miners due to incentives offered by ERCOT. However, these incentives raise questions about equity and fairness, as crypto miners can halt operations immediately to access demand-response benefits, unlike other major electricity consumers who require advance planning for curtailment.

The Article focuses on Riot, Texas's largest mining company, amongst other mining companies, to illustrate the issues with ERCOT's policies that allow miners to exploit grid reliability programs for profit. It examines both state and federal bills aimed at protecting consumers from increased electricity costs due to miner participation in ERCOT programs. The preliminary conclusion is that miners derive substantial revenue not from mining itself, but from manipulating grid reliability programs. Proposed legislative changes could address these loopholes, ensuring a more equitable approach for Texas consumers.

* © 2026 Shray Tapiawala. Shray Tapiawala is a Legal Researcher at the National Laboratory of the Rockies, formerly known as the National Renewable Energy Laboratory (NREL). He graduated in 2025 from The George Washington University Law School, concentrating in Energy Law. He earned his Bachelor of Science in Electrical & Computer Engineering and Bachelor of Arts in History from The University of Texas at Austin in 2021. Prior to law school, Shray worked as an International Engineer at Invenergy, where he developed solar and battery storage projects across Texas, the Midwest, Israel, Greece, and Mexico. He also interned at ERCOT on their markets team in the Summer of 2020. During law school, he has interned with Rath, Young & Pignatelli; the U.S. Department of Commerce's Commercial Law Development Program (CLDP); Davis Wright Tremaine; and D.E. Shaw Renewable Investments, all in roles focused on energy law. Shray would like to extend special appreciation to Professors Chip (George) Cannon and Peter Malyshev for their exceptional teaching in the Energy Commodities class, and for deepening his understanding of energy commodities and FERC regulatory issues. His email is: Shrayt@law.gwu.edu and shray1207@yahoo.com. His LinkedIn is: <https://www.linkedin.com/in/stapiawala/>

74 *TULANE ENVIRONMENTAL LAW JOURNAL* [Vol. 39:73]

I.	INTRODUCTION	74
II.	HISTORY AND BACKGROUND	75
	A. <i>Cryptocurrency</i>	75
	B. <i>Electricity Usage by Crypto Miners</i>	76
	C. <i>Rise of Cryptomining in Texas</i>	76
	D. <i>Mining Operations</i>	78
III.	ISSUE	80
	A. <i>Responsive Reserve Services</i>	80
	B. <i>Power Purchase Agreements</i>	81
IV.	RULE	83
	A. <i>Texas Legislation</i>	83
	B. <i>Congressional Legislation</i>	86
V.	CONCLUSION	87

I. INTRODUCTION

Cryptocurrency mining has expanded in the United States, especially in Texas, as China pushes for more regulations in the mining process. When miners were looking for cheaper options, the Electric Reliability Council of Texas's (ERCOT) demand-response programs gave away millions to crypto mining companies.

This Article examines ERCOT's Load Resource and Responsive Reserve Services programs on cryptocurrency mining operations in the aim of creating a more equitable system for Texans. One focus will be on how to ensure that miners are not taking advantage of the Responsive Reserve Service in a way that no other industry in Texas is able to. Crypto miners are able to turn off mining at will while other heavy electricity consumers have to plan in advance to turn off or reduce operations. This Article concentrates on the U.S.'s and Texas's largest crypto mining company, Riot. There will be an investigation into their business model to underscore some of the problems in ERCOT's permittance of miners to participate in the different programs. There will also be an analysis of both a Texas bill and a U.S. bill aimed at protecting Texans and Americans, respectively, from having to pay increased costs for electricity as a result of the actions of miners.

The primary conclusion of this Article is that mining operations are predominately profiting off of different programs in ERCOT to protect grid reliability and relying less on mining itself. Miners in ERCOT can participate in load response programs and also sell electricity purchased through power purchase agreements back to the market at a significantly higher price to promote grid reliability during times of high demand and

low supply. Recommended changes to the proposed bills would help to combat the problem of miners profiting off of ERCOT grid reliability policies.

II. HISTORY AND BACKGROUND

A. Cryptocurrency

Cryptocurrency is a digital currency secured by cryptography.¹ Cryptocurrencies exist on decentralized networks using blockchain technology, which is a distributed ledger enforced by computers located throughout the world.² This decentralized structure allows them to work without a general governing body or central government, which allows them to function without any government interference or manipulation.

While there are different names for cryptocurrencies, they fall under one of five categories: utility, transactional, governance, platform, and security. Bitcoin, the most common cryptocurrency is transactional, where it is designed as a payment method.

Cryptocurrencies like Bitcoin are generated through a process called mining, where computers solve complex mathematical problems necessary for transaction processing.³ The machine that successfully solves the problem first receives a reward in the form of cryptocurrency.⁴ The likelihood of obtaining a reward is higher for computers capable of performing more calculations per second, making them preferable for miners. Subsequently, the verified transaction is added to the blockchain, an unalterable ledger of transactions.⁵

As the number of transactions grows, the mining difficulty increases, demanding greater computing power. Present-day mining operations resemble specialized data centers, occupying entire warehouses with interconnected network servers numbering in the thousands.⁶

Miners race for rewards and transaction verification yields as they are monetarily rewarded for success. In 2021, the value of Bitcoin surged, reaching over \$61,000 by November 1 and peaking at \$68,790 later in the

1. Jake Frankenfield, *Cryptocurrency Explained with Pros and Cons for Investment*, INVESTOPEDIA (Nov. 3, 2023), <https://www.investopedia.com/terms/c/cryptocurrency.asp>.

2. *Id.*

3. *Id.*

4. *Id.*

5. *Id.*

6. *See* Frankenfield, *supra* note 1.

month.⁷ While prices have experienced notable declines in recent months, mining remains a profitable venture in specific regions, largely contingent on the electricity cost as a key input.

B. Electricity Usage by Crypto Miners

While Bitcoin represents just one among various cryptocurrencies, it serves as a key example of an escalating trend in mining. The surge in Bitcoin's price has paralleled a corresponding increase in mining activity, driven by the need to validate transactions and secure alluring rewards.⁸ The global power requirements for Bitcoin mining witnessed a nearly threefold surge in 2021.⁹ This figure rose from an annualized rate of 78 terawatt-hours (TWh) to 204 TWh.¹⁰ However, in recent times, there has been a sharp decline in power demands, closely following the loss of Bitcoin prices. A single Bitcoin transaction consumes approximately 1,452 kilowatt-hours (kWh) of electricity, equivalent to the power usage of an average U.S. household for nearly 50 days.¹¹

C. Rise of Cryptomining in Texas

The substantial power demands of mining, along with its environmental implications, played a role in the ban in China, previously the global leader in mining activity, on cryptocurrency mining in September 2021. The Chinese government cited reasons such as the need to combat financial crimes and address financial instability caused by cryptocurrencies.¹² Some experts argue that a significant concern for China was the potential of cryptocurrency to facilitate capital flight from the country. The ban in China created opportunities for increased mining activity in the United States, with Texas emerging as one of the most attractive destinations.¹³

The substantial energy consumption of cryptocurrency mining raises significant concerns in Texas, especially in the aftermath of Winter Storm

7. David Green & Siddhartha Kazi, *Cryptocurrency in Texas Opportunities and Challenges in Mining Digital Coins*, TEX. COMPTROLLER (Aug. 2022), <https://comptroller.texas.gov/economy/fiscal-notes/archive/2022/aug/crypto-tx.php>

8. *Id.*

9. *Id.*

10. *Id.*

11. *Id.*

12. See Green & Kazi, *supra* note 7.

13. MacKenzie Sigalos, *Bitcoin Miners Beef up Texas Operations Ahead of Extinction-Level Event, Exclusive Data Shows*, CNBC (Sep. 26 2023), <https://www.cnbc.com/2023/09/26/where-are-bitcoin-miners-in-2023-texas.html>.

Uri¹⁴ and vulnerabilities in the state's electric grid. Experts estimate that around 3,000 megawatts (MW) of mining operations operate in Texas daily, constituting approximately four percent of peak demand, which

14. The storm produced record load duration of freezing temperatures and snowfalls which put the whole state under a winter weather warning. This meant that more than 4.5 million Texas homes and businesses were without power during a time of peak electricity demand. See Joshua Fechter, *Texas' Power Grid Held up During Last Week's Winter Weather. Experts Say It Wasn't Seriously Tested.*, TEX. TRIB. (Feb. 8, 2022), <https://www.texastribune.org/2022/02/08/texas-winter-weather-power-grid/>. Furthermore, as most Texas homes are powered with electric heaters, it added to the peak demand. With freezing temperatures, many water pipes at generation facilities also froze, leading to issues in quality. See Erin Douglas et al., *Texas Leaders Failed to Heed Warnings that Left the State's Power Grid Vulnerable to Winter Extremes, Experts Say*, TEX. TRIB. (Feb. 17, 2021), <https://www.texastribune.org/2021/02/17/texas-power-grid-failures/>. This was further exacerbated by a gas shortage at generation facilities due to the frozen pipelines causing supply to decrease and gas prices to soar. The situation caused a state of emergency in Texas. Winter Storm Uri was one of the most catastrophic winter storms to hit Texas, causing widespread blackouts, extremely high wholesale electric prices, and mayhem throughout ERCOT from generators to customers. There were many causes for peak electricity demand, but the primary reason was that half of Texans use electricity for heating their homes. Furthermore, with the extreme drop of temperatures on the February 15, 2021 there was an estimated 75 GW of projected demand, but only 44 GW of electricity was actually delivered due to controlled outages across the system; see United States Energy Information Administration, *Extreme Winter Weather Is Disrupting Energy Supply and Demand, Particularly in Texas*, <https://www.eia.gov/todayinenergy/detail.php?id=46836>. The Generation went offline due to generation plants not being prepared for the extreme cold weather, and in many places record cold with the lowest temperature below 0°F. This caused the gas supply to freeze, so gas was then in short supply. Furthermore, thermal plants accounted for 28 GW, producing around thirty-seven percent of their capacity, and one nuclear plant South Texas Nuclear Power produced 1.3 GW; see Electric Reliability Council of Texas, Fact Sheet (2020), https://www.ercot.com/files/docs/2020/11/10/ERCOT_Fact_Sheet_11.10.20.pdf. In Winter Storm Uri, renewable wind and solar plants produced 18 GW of electricity, while the total build capacity of renewables in ERCOT during February 2021 was 26 GW; see Electric Reliability Council of Texas, *Final Seasonal Assessment of Resource Adequacy for the ERCOT Region (SARA)*, Winter 2020/2021 (Nov. 5, 2020), <https://www.ercot.com/files/docs/2020/11/05/SARA-FinalWinter2020-2021.pdf>. The 18 GW generated was particularly key to ensuring access to electricity during the power outages as ERCOT has 10 GW accounted for in its peak planning forecast; see United States Energy Information Administration, *Hourly Electric Grid Monitor*, https://www.eia.gov/electricity/gridmonitor/dashboard/electric_overview/US48/US48. This amounted to a reduction of 15 GW in gas, 3 GW of coal, 1 GW of nuclear power, and 4 GW of wind energy. In its peak planning forecast, ERCOT plans for low renewable energy outputs with one hundred percent of electricity needs coming from thermal sources. For the winter of 2020-21, the forecast for a peak capacity of 85 GW was planned to be sourced 87% (76 GW) from thermal sources, 9.7% (9.3 GW) from wind power, and 1% (0.7 GW) from solar power. Furthermore, around 50% of ERCOT's capacity comes from natural gas; see ERCOT, *Final Seasonal Assessment of Resource Adequacy for the ERCOT Region (SARA)*, Winter 2020/2021 (Nov. 5, 2020). The dependence on renewable sources is increasing for peak winter fuel types while dependency on gas is decreasing the most.

represents the highest electricity demand on the hottest days.¹⁵ ERCOT¹⁶ anticipates a potential increase in mining operations reaching an average of 6,000 MW usage daily in the next couple of years, with a projected rise to 17,000 MW by 2030.¹⁷ To put this in perspective, current peak demand in Lubbock, Texas is 444 MW, and in Houston, it's about 20,000 MW.¹⁸

This potential surge in power demand poses significant challenges. The growth of the Texas grid has historically kept pace with supply and demand. However, the accelerated growth in demand from mining operations could outstrip the state's ability to build power infrastructure quickly.

D. Mining Operations

A moderate-sized cryptocurrency mine utilizes about 200 MW of power daily, equivalent to the power needs of downtown Dallas.¹⁹ If Texas were to have ten more such mines, it could potentially disrupt the delicate balance between supply and demand, especially given the state's rapid population growth, a significant factor in power supply dynamics. The exact number of mining operations in the state is challenging to determine as there are no registration requirements. However, according to the Texas Blockchain Council, at least twenty-seven mining operations are currently in operation, with more anticipated in the future.²⁰

One example is Helios, located outside of Lubbock, which plans to have 50,000 servers in a 1,050-foot-long structure by the year's end.²¹ The site's computing power is high, "executing four quintillion calculations every second, with aspirations to generate over 1,000 bitcoins annually".²² Texas is home to approximately ten large-scale mining operations like Helios.²³

15. See Green & Kazi, *supra* note 7.

16. ERCOT functions as an operation by balancing supply and demand by controlling the flow of electricity. It is best compared to an air traffic controller, which does not own the runway, nor the plane, but solely directs traffic. See Electric Reliability Council of Texas, *How Does ERCOT Work?*, FACEBOOK (June 20, 2019), <https://www.facebook.com/watch/?v=738351169915343>. ERCOT controls ninety percent of the electric load in Texas through 46,500 miles of transmission lines; see Douglas et al., *supra* note 14.

17. See Green & Kazi, *supra* note 7.

18. *Id.*

19. *Id.*

20. *Id.*

21. *Id.*

22. *Id.*

23. *Id.*

Texas made up 8.43% of the hashrate in the U.S. as of the end of 2021, and that percentage has jumped to 28.50% as of July 27, 2023 . . . though Foundry notes that the data was aggregated during a period of heavy curtailment in July, so Texas's percentage of actual hashrate is even greater than what's reflected on their latest map.²⁴

In the U.S., mines consume more than 3,900 MW of electricity.²⁵ The five largest bitcoin mines in Texas are Riot Platforms, Cipher, U.S. Bitcoin, Rhodium, and Bitdeer.²⁶ Riot is in Rockdale, Texas with a load of 450 MW, with ninety-six percent of its electricity usage coming from fossil fuels.²⁷ The facility is currently expanding with plans to have a total load of 700 MW. To put it in perspective, Riot's Rockdale facility uses the same amount of electricity as the nearest 300,000 homes, making it also one of the most power-intensive cryptocurrency mines in America.²⁸ Riot recently broke ground on a facility near Corsicana, Texas with ERCOT approval for 1 GW of electricity.²⁹ Cipher is in Odessa, Texas with a load of 207 MW and ninety-two percent of its electricity coming from fossil fuels.³⁰ U.S. Bitcoin is in Upton County at 200 MW with ninety-two percent of its electricity coming from fossil fuel sources.³¹ Rhodium has a load of 185 MW in Temple, Texas with ninety percent of its electricity coming from fossil fuels.³² Bitdeer in Rockdale, Texas uses 170 MW with ninety-six percent of its electricity coming from fossil fuels.³³ Riot and Bitdeer, which are located within a mile from each other use more power than all of the households within a forty-mile radius.³⁴

The importance of Texas's infrastructure and ERCOT rules come into play when there are extreme weather events like Winter Storm Uri. Mining facilities like Riot and Bitdeer continuously receive payments

24. See Sigalos, *supra* note 13.

25. Gabriel J.X. Dance, *The Real-World Costs of the Digital Race for Bitcoin*, N.Y. TIMES, (Apr. 11 2023), <https://www.nytimes.com/2023/04/09/business/bitcoin-mining-electricity-pollution.html>.

26. *Id.*

27. *Id.*

28. *Id.*

29. Fred Cantu, *Texas Senate Bill Seeks to Regulate Bitcoin Miners and Their Electricity Consumption*, CBS AUSTIN, (Mar. 28, 2023), <https://cbsaustin.com/news/local/texas-senate-bill-seeks-to-regulate-bitcoin-miners-and-their-electricity-consumption-riot-platforms-ercot-rockdale>.

30. See Dance, *supra* note 25.

31. *Id.*

32. *Id.*

33. *Id.*

34. *Id.*

from ERCOT to be prepared to reduce or stop giving load on the grid during high demand or high energy prices in the node.³⁵

III. ISSUE

A. *Responsive Reserve Services*

This leads to the larger issue of whether Responsive Reserve Services should apply to cryptocurrency miners as they benefit both from their business model as well as the incentives issued from the Responsive Reserve Services with little oversight for how the two relate.

The payments for mining companies like Riot come through ERCOT and the Public Utility Commission of Texas (PUCT)³⁶ programs that are part of the Responsive Reserve Service (RRS). In the Responsive Reserve Service, participants get paid with funds from ratepayers for agreeing to cut back energy use.³⁷ In this program, miners get paid for enrollment in the program and remaining on standby to stop using electricity by ERCOT's request, despite the fact that such a request comes once to thrice per year.³⁸ Businesses that qualify to provide capacity as an ancillary service like RRS are known as Load Resources (LR).³⁹ In ERCOT, Responsive Reserve Service's program period is year-round, and the commitments are made one day ahead. Furthermore, the payments are \$85,000 to \$100,000 per megawatt-year for participation twenty-four hours a day, seven days a week.⁴⁰ ERCOT requires businesses with "stable and predictable load profiles" that can "safely curtail automatically and instantaneously" to become load response candidates for RRS.⁴¹ Furthermore, Load Responses must have a predictable load pattern that can be reliably estimated a day in advance.⁴²

35. Allyson Chiu, *Limiting Crypto Helped the Texas Power Grid Weather a Heat Wave*, WASH. POST, (July 15, 2022), <https://www.washingtonpost.com/climate-solutions/2022/07/15/bitcoin-crypto-texas-heat-wave/>.

36. The Public Utility Commission of Texas is a state agency that regulates the state's electric, water, and telecommunication utilities; implements relevant legislation; and resolves consumer complaints.

37. Jeff St. John, *Why Aren't Texans Paid to Help Prevent Blackouts During Heat Waves?*, CANARY MEDIA, (July 24, 2023), <https://www.canarymedia.com/articles/grid-edge/why-arent-texans-paid-to-help-prevent-blackouts-during-heat-waves>.

38. *Earn Revenue and Protect Your Equipment in the ERCOT Responsive Reserve Service Program*, ENEL, https://www.enelx.com/content/dam/local-northamerica/resources/brochures/pdfs/P20034_faq_ERCOT_LR.pdf.

39. *Id.*

40. *Id.*

41. *Id.*

42. *Id.*

Crypto mining facilities would therefore qualify, as they have the same load on a daily basis due to their computers running at the same rates day to day. However, if a load is not able to fulfill the requirements of an RRS dispatch, loads “will never pay out-of-pocket penalties.”⁴³ In 2022 Riot made \$9.3 million from participating in the program eighty-five percent of the year, while they were asked to lower usage for only 3.5 hours in that year.⁴⁴ Through this method, Riot saved more than \$27 million in potential fees in 2022; for example, on June 23, 2022, Riot turned off mining of their own will, but if they had mined all day they would have incurred fees of \$5.5 million.⁴⁵

Furthermore, through the RRS, a program in which five of the six largest Texas mines participate, all but six enrolled mining companies elected to turn off mining almost every time fees were charged in 2022, saving them \$62 million.⁴⁶ Underscoring the inequity in this business method most industrial electricity users, unlike crypto miners, can shed an average of five to thirty percent of their load.⁴⁷

Miners will discontinue mining in times of high electricity prices as the cost would eat into their profits. This was apparent during Winter Storm Uri when prices hit the price cap and mining halted, as it would have been too expensive to continue to mine.⁴⁸ Furthermore, RRS allows companies like Riot to make millions for following a business model of using cheap electricity.

B. Power Purchase Agreements

Another business model that companies like Riot use involves selling electricity which they had originally procured through power purchase agreements (PPA) back to the grid.⁴⁹ Riot alone earned \$18 million in 2022 selling electricity that they had negotiated to obtain for low prices back into the market during peak demand periods when electricity prices had increased.⁵⁰ In ERCOT, where the price cap is high for wholesale electricity and price fluctuations are particularly extreme,

43. See Enel, *supra* note 38.

44. *Id.*

45. See Dance, *supra* note 25.

46. *Id.*

47. *Id.*

48. *Id.*

49. See Dance, *supra* note 25.

50. *Cryptocurrency Miners' Sweetheart Deal with Texas Threatens an Already Fragile Grid*, TECH TRANSPARENCY PROJECT, <https://www.techtransparencyproject.org/articles/cryptocurrency-miners-sweetheart-deal-texas-threatens-already-fragile-grid>.

miners like Riot can profit by shifting electricity they had originally intended to use back onto the grid. Furthermore, in 2022, Riot saved around \$27 million in potential fees by cutting back usage during high demand times.⁵¹ This essentially means Riot earns money even when they are not mining at full capacity from ERCOT subsidiaries and also from selling their electricity at higher prices.⁵² In their most recent earnings, it was disclosed that Riot made nearly four times as much in selling electricity than from mining Bitcoin.⁵³

As global warming continues to make weather patterns more extreme, events like Winter Storm Uri have caused many utility companies in an unregulated market to have heightened electricity prices for days at a time, who have then passed the charges onto their customers. On the other hand, companies like Riot were getting paid to reduce operations and shift their PPA-negotiated, cheaply bought electricity back to the grid for a profit, given the surge in electricity prices. This shift is something they would have already done in times of high electricity prices, but they also received bonuses for decreasing usage allowing them to make \$125 million during the storm that lasted five days.⁵⁴

In addition to winter storms, Texas has recently also faced large heat waves during which Riot earned millions of dollars by reducing usage and selling their electricity during times of peak demand, such as in the summer 2023, when it earned \$31.7 million in August alone.⁵⁵ Cipher Mines made \$1.2 million during Texas's heatwaves of June 2023.⁵⁶ To further elaborate on this inequity in the prices of electricity, most crypto mining companies could not operate during Texas's extreme heat wave in order to ensure a profitable cooling operation.⁵⁷

51. Dance, *supra* note 25.

52. Shawn Tully, *How Riot Blockchain Capitalized on a Hot Texas Summer to Make More Money Selling Power than Mining Crypto*, FORTUNE, <https://fortune.com/2022/08/13/riot-blockchain-bitcoin-mining-texas-electric-grid-subsidy/>.

53. *Id.*

54. Securities and Exchange Commission, EX-99.1 3 ex99x1.htm EXHIBIT 99.1: Whinstone US, Inc. and Subsidiary (a Delaware Corporation) Notes to Consolidated Financial Statements.

55. David Pan, *Bitcoin Miner Riot Platform Made a Record \$31 Million from Power Credits in August*, BLOOMBERG, (Sep. 6, 2023), <https://www.bloomberg.com/news/articles/2023-09-06/bitcoin-btc-miner-riot-riot-made-record-31-million-from-power-credits>.

56. Press Release, Cipher Mining, Cipher Mining Announces June 2023 Operational Update (July 5, 2023), <https://investors.ciphermining.com/news-releases/news-release-details/cipher-mining-announces-june-2023-operational-update>

57. See Colin Crossman And Robert Warren, *Beyond the Kwh: Factors that Bitcoin Miners Need to Consider*, BITCOIN MAG., (July 14, 2022), <https://bitcoinmagazine.com/markets/factors-bitcoin-miners-need-to-consider>; see also Aviral Shukla, *How to Design Optimal Airflow*

The extreme weather has underscored many vulnerabilities and issues in ERCOT; with 39 GW in usage expected to be added by 2027. This is a 1,300% increase from the 3 GW online in late 2023.⁵⁸ A change in the legislative and ERCOT rules needs to happen soon to ensure a reliable grid operation with the extra load coming online.

The expected consumption is also coupled with costs that are ultimately handed down to the everyday customer who pays on average 10.7 cents per kilowatt more than Riot.⁵⁹ Riot Mine has an agreement with TXU Energy Retail to buy electricity for 2.5 cents per kilowatt until 2030.⁶⁰ Bitcoin mining is driving an increase in Texas electricity prices, cost consumers five percent more, or an additional \$1.8 billion per year.⁶¹ Western Texas communities, where much of the mining is expected to take place, will see an increase in electricity costs by as much as nine percent.⁶² The extra cost is due to the participation in incentive programs that mining companies subscribe to.⁶³

IV. RULE

A. Texas Legislation

In March of 2023, Texas Senate Bill 1751 was created to prevent Responsive Reserve Services. SB 1751 passed through the state Senate unanimously in April of 2023, but has been halted after a committee hearing in the state House of Representatives.⁶⁴ Furthermore, this bill would require large customers—miners using larger than 10 MW—to coordinate directly with ERCOT in a power emergency.⁶⁵ Under Senate Bill 1571, cryptocurrency mining centers participating in ERCOT's Responsive Reserve Service would be capped at ten percent of the total load required by all loads in the program.⁶⁶ Another component of the bill

for a Bitcoin Mining Facility, HASHRATE INDEX, <https://hashrateindex.com/blog/bitcoin-mining-facility-design-airflow-management/>.

58. Green & Kazi, *supra* note 7.

59. Dance, *supra* note 25.

60. *Cryptocurrency Mining in Texas*, EARTH JUST. (Sep. 12, 2023), <https://earthjustice.org/feature/cryptocurrency-mining-texas>.

61. Dance, *supra* note 25.

62. Tim Fernholz, *Bitcoin Mining Has Raised Texas Electricity Prices 5%*, QUARTZ (Apr. 10, 2023), <https://qz.com/bitcoin-mining-has-raised-texas-electricity-prices-5-1850319961>.

63. *Id.*

64. SB 1751, 88(R), 2023, RS.

65. *Id.*

66. *Id.*

sought to control electricity demand from cryptocurrency mining by restricting the tax incentives to bring them to Texas.⁶⁷

This bill, if enacted in Texas, would be greatly beneficial for the state in its ongoing effort to improve the reliability and implement measures to ensure reliable growth in areas where large load centers exist. The current requirements for crypto facilities raise concerns for unregistered load usage. Furthermore, as the state continues to study issues impacting the ERCOT grid, including transmission planning and weatherization, it is vital for ERCOT to be aware of the new larger load sources interconnecting to the grid.

The proposed Responsive Reserve Service being capped at “10% of the total load required by all loads” in the program is a component that may make mining facilities reconsider a move to Texas as large firms enjoy taking advantage of the Reserve Response Service.⁶⁸ This is particularly crucial to the largest mining facilities like Riot, which is building another mining center and thus expanding the largest mining operation in the country, as this adds to the profitability of their operations. The original 450 MW Riot facility in Rockdale earned \$9.3 million one year from participating in the Responsive Reserve Program for eighty-five percent of that year, but with their facilities doubling in size, they have the potential to earn in excess of \$18.6 million if they participate for a full year. In a future Corsicana, Texas facility, closer to the Dallas-Ft. Worth load center, a similar situation is likely to happen with a 1 GW load.

Senate Bill 1751, however, does not lay out fully how it intends to put the ten percent cap into play. One possible option is to have two categories: non-crypto facilities and crypto mining facilities. As more electricity is needed on reserve from non-crypto facilities, they can add crypto facilities at up to ten percent of the total available electricity. Furthermore, this bill does not solve the larger issue that cryptocurrency miners are getting paid a significant amount of money from ERCOT to simply be available to turn off electricity as a part of their business model. Instead of capping electricity saved from turning off crypto mining facilities, the bill should instead be focused on capping the credits at ten percent of the total annual amount that a single mining facility would have received under the current plan. This alternative solution aims instead to promote grid reliability and ensure that mining facilities are available to turn off electricity by using incentives. These incentives would not be as

67. *Id.*

68. *Id.*

high as they are currently, but they would still be available as bitcoin mining continues to expand in Texas. In Riot's Rockdale facility, it would amount to about \$930,000 in incentives annually.

Another alternative solution would be to tie the Responsive Reserve Service to the price of bitcoin. To prevent mining centers from running at a significant loss during low bitcoin prices, and to prevent mining centers to continue to receive incentives with high bitcoin prices, the amount paid to centers should be in relation to the price of bitcoin. The equation would take the average price of bitcoin in a given month and subtract from it the company's publicly released cost of mining one bitcoin or \$8,227, which was the cost of one bitcoin to mine for Riot in third quarter 2022⁶⁹—using whichever number is higher—and dividing by 1,000. Then that total would be multiplied by the number of bitcoins or equivalent currency mined in that month and subtracting the new total from \$85,000. This would give the amount in credits received per month, keeping in mind SB 1571.

Senate Bill 1571 also brings about concerns in tax incentives for mining facilities. As many cryptocurrency facilities have included tax incentives in their business decision to move to Texas, this bill has the potential to reduce the number of mining facilities moving there. The discouragement is something that the bill intends to highlight and is corroborated by mining facilities as they have argued that it cuts into the profitability and reduces the amount of donations and support given to rural communities that they belong to. For example, Riot recently donated gear to the football team in Rockdale, Texas.⁷⁰ While it was a move of goodwill, it has failed to garner support from the authors and supporters of Senate Bill 1571, as the donation is a fraction of the tax abatement received in the development of the mining facility received by Rockdale School District and the City of Rockdale.

Finally, another concept that the Senate Bill 1571 does not address is the ability of mining facilities to sell power purchased at low rates to the market at increased electricity rates during periods of high demand. In 2022, Riot earned \$18 million from selling power back to the grid during

69. Press Release, Riot Platforms, Riot Platforms Reports Third Quarter 2023 Financial Results, Current Operational and Financial Highlights (Nov. 7, 2023), <https://www.riotplatforms.com/riot-platforms-reports-third-quarter-2023-financial-results-current-operational-and-financial-highlights/>.

70. Brianna Smith, *Bitcoin Company Helps Parents Curb Inflation Costs for Sports Gear with Unexpected Donation*, CBS, (Dec. 8, 2023), <https://www.kxxv.com/news/local-news/in-your-neighborhood/milam-county/bitcoin-company-helps-parents-curb-inflation-costs-for-sports-gear-with-unexpected-donation>.

elevated demand at a higher price, which ultimately caused consumers to pay more in electricity as prices increased from high demand and low supply.⁷¹ In order to address this issue, the Texas Senate Bill should also include a provision where a mining facility can only profit by up to ten percent of their original power purchase agreement rate, with any remainder between the clearing price and PPA price going to ERCOT for a fund to be returned in the form of Response Reserve Credit. This would ensure that in ERCOT, small consumers would not have to foot the bill for mining facilities' participation in responsive reserve services. The current method, a free-market method which is the underlying ideology of ERCOT, would cost Texans a lot of money once the 39 GW of mining interconnects with the grid.⁷² In preparation of future mining, it is crucial that a more equitable solution is created so that all Texans can afford electricity.

B. Congressional Legislation

Another method to ensure that cryptocurrency mining is done with good intentions and a useful supplement to SB 1571 is the proposed Lummis-Gillibrand Responsible Financial Innovation Act. In the most recent iteration of the bill, there are many concepts proposed that, unlike in previous versions of the act, are not limited to the Federal Energy Regulatory Commission's jurisdiction, which ERCOT does not fall under.⁷³ The bill proposes that the agencies should analyze 1) the cryptocurrency usage in the energy consumption of mining and staking crypto asset transactions in the financial services industry; 2) the effects of energy consumption on national, regional, and local energy prices; 3) the effects of mining and staking crypto asset transactions on baseload

71. *Cryptocurrency Miners' Sweetheart Deal with Texas Threatens an Already Fragile Grid*, *supra* note 50.

72. Green & Kazi, *supra* note 7.

73. An Introductory Guide to Electricity Markets regulated by the Federal Energy Regulatory Commission, FED. ENERGY REG. COMM'N, [https://www.ferc.gov/introductory-guide-electricity-markets-regulated-federal-energy-regulatory-commission#:~:text=%5Bvii%5D%20ERCOT%20is%20not%20subject,to%20federal%20\(FERC\)%20oversight;+Compare+Lummis-Gillibrand+Responsible+Financial+Innovation+Act,+S.+4356,+117th+Cong.+%24806+\(2022\)+\(requires+the+Federal+Energy+Regulatory+Commission,+the+Commodity+Futures+Trading+Commission,+and+the+Securities+and+Exchange+Commission+to+analyze+energy+consumption+in+relation+to+cryptocurrencies\)+with+Lummis-Gillibrand+Responsible+Financial+Innovation+Act,+S.+2281,+118th+Cong.+%24904+\(2023\)+\(stating+that+the+Energy+Information+Administration+shall+submit+to+the+Committees+on+Energy+and+Natural+Resources+and+Environment+and+Public+Works+of+the+Senate+and+the+Committees+on+Energy+and+Commerce+and+Natural+Resources+of+the+House+of+Representatives+a+report+that+analyzes+energy+consumption+in+relation+to+cryptocurrencies\).](https://www.ferc.gov/introductory-guide-electricity-markets-regulated-federal-energy-regulatory-commission#:~:text=%5Bvii%5D%20ERCOT%20is%20not%20subject,to%20federal%20(FERC)%20oversight;+Compare+Lummis-Gillibrand+Responsible+Financial+Innovation+Act,+S.+4356,+117th+Cong.+%24806+(2022)+(requires+the+Federal+Energy+Regulatory+Commission,+the+Commodity+Futures+Trading+Commission,+and+the+Securities+and+Exchange+Commission+to+analyze+energy+consumption+in+relation+to+cryptocurrencies)+with+Lummis-Gillibrand+Responsible+Financial+Innovation+Act,+S.+2281,+118th+Cong.+%24904+(2023)+(stating+that+the+Energy+Information+Administration+shall+submit+to+the+Committees+on+Energy+and+Natural+Resources+and+Environment+and+Public+Works+of+the+Senate+and+the+Committees+on+Energy+and+Commerce+and+Natural+Resources+of+the+House+of+Representatives+a+report+that+analyzes+energy+consumption+in+relation+to+cryptocurrencies).)

power levels; 4) the use of renewable and nonrenewable energy sources for powering crypto asset mining operations; and 5) crypto asset market energy consumption in comparison to the energy consumption of the financial services industry and economy as a whole.⁷⁴ The Lummis-Gillibrand Act for electricity prices does not require mining companies to change how they should use electricity, but instead gives governmental agencies the responsibility to work with miners to publicly report electricity consumption information. This bill, if passed with the alternative form of SB 1751 proposed earlier in this Article, would shed light on the current mining practices in Texas in regards to the information published under § 904 in the Lummis-Gillibrand Act. Furthermore, the combination would also give Texans a view into the energy allocation of the state for crypto mining, and it give local municipalities the ability to decide the development of future mining facilities.

The Lummis-Gillibrand Act in its current form is well written with many portions of mining considered from a civilian perspective, but one thing that can be added to § 904, is to make the power purchase agreement prices of electricity for mining facilities public information. This would be crucial to the public's understanding of ERCOT electricity prices as, during extreme weather events, miners like Riot sell their cheaper negotiated electricity into the wholesale market.

In the case of Rockdale, Texas⁷⁵, § 904 of the Act would be crucial for the town to understand their electricity prices in relation to the rest of the state, especially when it come to extreme weather events. Furthermore, if during such weather events electricity prices increase significantly, it would give citizens the ability to decide whether to allow mining operations to expand or allow other mining facilities to move to the area.

V. CONCLUSION

In addition to exploring the effects of crypto mining facilities in Texas on ERCOT pricing structures and mining companies' business models, this Article focused on two significant proposals in both the U.S. and Texas congresses. First, U.S. Senate Bill 1571 aims at protecting Texans' interests by limiting the amount of tax and demand response incentives that can be given to crypto miners. While the foundation of the bill is good, there are many parts that need to be changed to promote

74. *Id.*

75. Rockdale, Texas is where two of the largest mining facilities are located: Riot and Bitdeer.

equity, but which would also keep Texas as a leader of cryptocurrency mining. Additionally, there is an analysis of the Lummis-Gillibrand Responsible Financial Innovation Act, which gives governmental agencies the responsibility of publishing information annually about cryptocurrency mining operations across the country. While, the Lummis-Gillibrand Act is well written from an electricity consumption perspective, if enacted in tandem to the revised Texas bill as presented in this Article, it would provide insight into mining operations that are crucial to municipality development and would help the state prepare for the projected increase of 39 GW.