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## Toto, I've a Feeling the Environment Isn't Safe from Cryptocurrency Anymore: The Degrading Ecological Effects of Bitcoin and Digital Currencies

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TOTO, I'VE A FEELING THE ENVIRONMENT ISN'T SAFE  
FROM CRYPTOCURRENCY ANYMORE: THE  
DEGRADING ECOLOGICAL EFFECTS OF  
BITCOIN AND DIGITAL  
CURRENCIES

I. WE'RE OFF TO SEE . . . HOW CRYPTOCURRENCY WORKS

Cryptocurrencies are traded forms of digital assets that are extracted from digital locations after high-powered computers run complex algorithms.<sup>1</sup> The mining of cryptocurrencies has a detrimental effect on the environment.<sup>2</sup> Although it may seem that cryptocurrency and climate change are unrelated, studies have shown there to be a strong connection.<sup>3</sup> Experts do not agree whether cryptocurrencies will become more or less popular given recent regulation, but if they become more popular and as they become more accessible, their increased use may lead to a severe environmental impact.<sup>4</sup>

This Comment will discuss cryptocurrencies and their relation to climate change.<sup>5</sup> Additionally, it will address divergent expert opinions on the actual environmental impact of cryptocurrency and the best approach to its regulation.<sup>6</sup> Experts are divided on whether cryptocurrency mining will have a positive or negative effect on the environment, which often affects policy construction.<sup>7</sup> Finally, this Comment will explore China's approach to cryptocurrency regulation, including its successes and failures, to provide a

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1. See Jake Frankenfield, *Cryptocurrency*, INVESTOPEDIA, <https://www.investopedia.com/terms/c/cryptocurrency.asp> (last updated May 5, 2020) (offering general definition of cryptocurrency).

2. See Nathan Reiff, *What's the Environmental Impact of Cryptocurrency*, INVESTOPEDIA, <https://www.investopedia.com/tech/whats-environmental-impact-cryptocurrency/> (last updated May 9, 2018) (highlighting nature of cryptocurrency's environmental effects).

3. See *id.* (acknowledging lack of obvious link between cryptocurrency and environmental impact).

4. See *id.* (noting cryptocurrency miners offer plausible explanation for positive net benefit of mining cryptocurrency).

5. For a further discussion of the founding and inceptions of cryptocurrency, see *infra* notes 13-28.

6. See Heidi Samford & Lovely-Frances Domingo, *The Political Geography and Environmental Impacts of Cryptocurrency Mining*, U. WASH. HENRY M. JACKSON SCH. INT'L STUD. (July 10, 2019), <https://jsis.washington.edu/news/the-political-geography-and-environmental-impacts-of-cryptocurrency-mining/> (alluding to later discussion of cryptocurrency's environmental impact).

7. See *id.* (explaining disagreement among experts regarding impact of cryptocurrency on environment).

backdrop for hypothesizing the likely success of current and future cryptocurrency regulation in the United States.<sup>8</sup>

Although regulation in the United States is in its early stages, each new statute or environmental law will significantly impact the prevalence of cryptocurrency mining, which allows users to extract their own money by having their computers solve elaborate coding problems.<sup>9</sup> Previously thought to be strictly harmful and exploitative, cryptocurrency mining may actually be beneficial.<sup>10</sup> This Comment will explore differing views on cryptocurrency since its inception, weigh its advantages and disadvantages, and consider potential solutions to cryptocurrency mining.<sup>11</sup> To understand these issues, a cursory overview of the cryptocurrency mining process and how users interact with the currency is necessary.<sup>12</sup>

## II. BEHIND THE CRYPTOCURRENCY MINER'S CURTAIN

Cryptocurrency is a new form of digital money.<sup>13</sup> Unlike traditional banking, cryptocurrency is based on a decentralized network controlled by an interconnected system of computers.<sup>14</sup> This is called blockchain technology.<sup>15</sup> The term cryptocurrency comes from the complicated encryption systems used to secure the decentralized network and the exchange of cryptocurrency.<sup>16</sup>

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8. See Bitmex Research, *Mining Incentives, part 2: Why is China dominant in Bitcoin Mining?*, BITMEX, <https://blog.bitmex.com/mining-incentives-part-2-why-is-china-dominant-in-bitcoin-mining/> (last updated Sept. 15, 2017) (highlighting China's experience with cryptocurrency and relation to United States' potential path).

9. See Samford & Domingo, *supra* note 6 (describing event which started cryptocurrencies). Cryptocurrency "mining" simply refers to the process by which users direct their computers to solve puzzles and store the information in a blockchain. *Id.* (explaining process of obtaining cryptocurrency). The blockchain is a public record that is theoretically resistant to hacking and publishes "currency production and ownership." *Id.* (identifying numerous benefits of blockchain).

10. See Frankenfield, *supra* note 1 (discussing potential positive impact of cryptocurrency).

11. *Id.* (describing research that alludes to potential positives of virtual currency).

12. *Id.* (noting background knowledge needed to understand other issues).

13. See Frankenfield, *supra* note 1 (highlighting cryptocurrency as up and coming form of currency).

14. See *id.* (explaining relatively new form of currency called cryptocurrency).

15. See *id.* (identifying blockchain technology).

16. *Id.* (describing meaning of term and its relation to encryption techniques). Safeguards such as elliptical curve encryption, public-private key pairs, and hashing functions protect both the individual miners and the network as a whole during the cryptocurrency mining process. *Id.* (describing safeguards for miners).

Unlike centralized banking, cryptocurrency allows users to easily transfer funds between one another.<sup>17</sup> Two users agree to a transfer and execute the trade without engaging a third party, such as a bank, who charges a fee.<sup>18</sup> Cryptocurrencies use layers of security in the form of public and private keys.<sup>19</sup> The public key is a user's account address or "wallet," which is publicly-available information.<sup>20</sup> The private key acts as a security measure to sign personally-approved transactions.<sup>21</sup> Blockchain technology also enables cryptocurrencies to function properly.<sup>22</sup> It is applicable to a number of industries that the general public may not yet realize, meaning cryptocurrencies might become more widely used.<sup>23</sup> For example, blockchain technology could be used in the "manufacturing, food, and governance" industries, meaning its use might occur more frequently.<sup>24</sup>

Cryptocurrencies emerged after a computer expert discovered a mining process that allows users to extract money when their computers solve coding problems.<sup>25</sup> The complicated computer processes to mine even a single coin require extensive computing resources and power.<sup>26</sup> Following the release of the original cryptocurrency, Bitcoin, many alternate cryptocurrencies have emerged.<sup>27</sup> In fact, more than 2500 cryptocurrencies now exist.<sup>28</sup> This Comment will use Bitcoin as an exemplar currency to explore

17. Frankenfield, *supra* note 1 (citing ease of transfer as primary advantage to trading in cryptocurrency).

18. *See id.* (explaining lack of need for third party in trading cryptocurrency transactions).

19. *Id.* (highlighting security measures of internet currency).

20. *Id.* (defining public key as user's viewable "wallet").

21. *Id.* (illustrating benefit of private key in security of transactions).

22. Frankenfield, *supra* note 1 (identifying blockchain as key feature for cryptocurrency survival).

23. *Cryptocurrency Rules and Regulations You Should Know*, SOFI LEARN, <https://www.sofi.com/learn/content/cryptocurrency-rules-regulations/> (last updated Dec. 4, 2019) (stating applicability of blockchain technology to different industries).

24. *Id.* (listing industries apt for blockchain technology).

25. *See* Samford & Domingo, *supra* note 6 (describing event which started cryptocurrencies). For an explanation of cryptocurrency mining, see *supra* note 9.

26. *See id.* (explaining expensive process of mining). Due to the increasing difficulty of the computer puzzles, the energy required for the computers to complete the necessary algorithms increases. *Id.* (addressing increased energy needs). As of July 2019, one Bitcoin could cost "anywhere between \$3,224 and more than \$9,000 to mine . . . ." *Id.* (citing cost of mining Bitcoin).

27. Frankenfield, *supra* note 1 (highlighting pervasive nature of alternative forms of cryptocurrency).

28. Andrew L. Goodkind ET AL., *Cryptodamages: Monetary value estimates of the air pollution and human health impacts of cryptocurrency mining*, 59 ENERGY RES. & SOC. SCI. 101281, \*1 (Jan. 2020) (reporting amount of varieties of cryptocurrency).

a typical transaction, its appeal to miners, and the resources required.<sup>29</sup>

#### A. If I Only Had a Brain, I Could Mine Bitcoin

Bitcoin, the most well-known system of cryptocurrency, has experienced substantial success.<sup>30</sup> Satoshi Nakamoto — a pseudonym for an individual or group — launched Bitcoin in 2009.<sup>31</sup> There were over eighteen million bitcoins in circulation, valued at approximately \$146 billion, as of the end of 2019.<sup>32</sup>

After Bitcoin's creation, interested miners could benefit from the hard work of a computer.<sup>33</sup> Essentially, a Bitcoin miner commands a powerful computer to solve complicated algorithms or math problems.<sup>34</sup> After a successful algorithm decryption, the cryptocurrency system rewards the miner with a Bitcoin, a unit of currency, as a prize.<sup>35</sup> The Bitcoin is then released to the miner, recorded on the corresponding ledger, and viewable by other Bitcoin users.<sup>36</sup> The ledger, or blockchain, contains "blocks" of digital information recording "batches of transactions (with dates, times, amounts, participants . . . and a unique transaction identifier or hash), in a distributed peer-to-peer network of computers."<sup>37</sup> Each time a transaction is completed, data from the verified exchange is recorded by the blockchain for all users to see.<sup>38</sup>

#### B. Blockchains and Ledgers and Decentralized Authority, Oh My!

Although stereotypically portrayed as paranoid and secretive, computer enthusiasts and cryptocurrency miners actually value

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29. *See generally id.* (outlining best method to grasp cryptocurrency by single transaction of Bitcoin).

30. *See id.* (introducing Bitcoin as most popular and successful form of cryptocurrency).

31. *See* Frankenfield, *supra* note 1 (identifying Bitcoin's creator).

32. *See id.* (highlighting impressive circulation and monetary value of Bitcoin).

33. *See* Reiff, *supra* note 2 (explaining Bitcoin's success in cryptocurrency sector).

34. *Id.* (explaining Bitcoin decryption process).

35. *Id.* (illustrating mining in general terms).

36. *See* Frankenfield, *supra* note 1 (explaining crypto process following release of token to miner).

37. Goodkind, *supra* note 28 (relaying process of mining and token release in simplified terms). The blockchain records transactions with unique digital signatures rather than names or identifying information to retain anonymity. *Id.* (explaining blockchain recorded information).

38. *Id.* (connecting blockchain technology and transparency).

transparency.<sup>39</sup> Decentralization across innumerable networks and layers of encryption prevents one person from having full control.<sup>40</sup> Miners especially appreciate that even the most sophisticated programmers cannot tamper with the system.<sup>41</sup> Therefore, the decentralized nature of cryptocurrency appeals to those who dislike or distrust centralized authority and government interference.<sup>42</sup> Also, this special characteristic of cryptocurrency complicates government regulation.<sup>43</sup>

Another appeal of any cryptocurrency system is the support of blockchains and ledgers.<sup>44</sup> Blockchains are the foundation of cryptocurrency systems because they function as digital ledgers, recording past transactions and sharing information with other miners.<sup>45</sup> The automated nature of receiving coins and the transparent system of recording the payouts, facilitated by blockchain, appeals to miners over traditional banking.<sup>46</sup> There are no late fees, overdrawn accounts, or interest payments in cryptocurrency.<sup>47</sup>

### C. Cryptocurrency is Not Only for Wicked Witches

Cryptocurrencies were once viewed as a vehicle for criminals and terrorists to finance their nefarious operations.<sup>48</sup> Cryptocurrencies are admittedly attractive to criminals.<sup>49</sup> Tax evasion and

39. *See id.* (explaining transparent nature of cryptocurrency).

40. *Id.* (explaining appeal of minimal governmental interference in cryptocurrency mining).

41. *See id.* (explaining decentralized nature of currency).

42. *See* Goodkind, *supra* note 28 (highlighting connection between crypto miners and their distrust of government authority).

43. *See* Frankenfield, *supra* note 1 (portraying difficulty of regulating cryptocurrency).

44. *See* Reiff, *supra* note 2 (hinting at importance of blockchains in cryptocurrency).

45. *Id.* (describing blockchains generally and their functions).

46. *Id.* (elucidating cryptocurrency's benefits including transparency). A distributed ledger is a database accessible across multiple sites, institutions, and geographies, which enables members of the public to view transactions. Christina Majaski, *Distributed Ledgers*, INVESTOPEDIA, <https://www.investopedia.com/terms/d/distributed-ledgers.asp> (last updated May 12, 2020) (defining distributed ledger). Participants in the blockchain network can access all recorded transactions and own a copy of the recordings. *Id.* (explaining scope of access to distributed ledger).

47. Nathan Reiff, *What Are the Advantages of Paying With Bitcoin?*, INVESTOPEDIA, <https://www.investopedia.com/ask/answers/100314/what-are-advantages-paying-bitcoin.asp> (last updated July 13, 2020) (comparing cryptocurrency to traditional banking).

48. *See* Reiff, *supra* note 2 (explaining original attitudes regarding cryptocurrency as exceedingly negative).

49. Frankenfield, *supra* note 1 (noting likelihood some criminals use cryptocurrency).

money laundering are easier through cryptocurrency because of the system's relatively anonymous nature.<sup>50</sup> Cryptocurrency proponents cite the system's importance to whistleblowers or activists under repressive governments based on the private nature of the system.<sup>51</sup> Bitcoin has recently allowed authorities to conduct forensic analyses of the blockchain to arrest criminals, which has made it exceedingly difficult for criminals to conduct illegal business with Bitcoin.<sup>52</sup> It is still challenging for authorities, however, to comb through the blockchains of other cryptocurrency companies such as Dash, Monero, and ZCash.<sup>53</sup>

According to a 2015 Europol report, Bitcoin was implicated in a massive investigation of payments between criminals.<sup>54</sup> The investigation found that over forty percent of illicit transactions in the European Union were processed through Bitcoin.<sup>55</sup> Digital currencies have an air of secrecy which frustrates law enforcement's role in identifying criminals.<sup>56</sup> Criminals value a system of transacting money anonymously where certain safeguards are in effect to ensure that other criminals cannot scam them.<sup>57</sup>

In the last few years, cryptocurrencies have become increasingly accessible to those with the brain and computer power to "mine" them.<sup>58</sup> The general rule in the cryptocurrency community is if people can legally own and use cryptocurrency where they live, they can probably legally mine in that location as well.<sup>59</sup> If it is illegal for people to own and use cryptocurrency where they live, it is likely illegal to mine in that place too.<sup>60</sup>

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50. *Id.* (citing exemplar money crimes which are easier to commit with virtual currency).

51. *Id.* (referencing argument that miners under oppressive governments benefit from cryptocurrency's private nature).

52. *Id.* (demonstrating Bitcoin's efforts to eliminate illegal activity within its system).

53. *Id.* (mentioning brands more apt for criminal activity).

54. Nikita Malik, *How Criminals and Terrorists Use Cryptocurrency: And How To Stop It*, FORBES (Aug. 31, 2018, 10:08 AM), <https://www.forbes.com/sites/nikitamalik/2018/08/31/how-criminals-and-terrorists-use-cryptocurrency-and-how-to-stop-it/#4584a9973990> (citing Europol report on cryptocurrency transactions).

55. *Id.* (explaining statistics of illicit cryptocurrency in European Union).

56. *Id.* (noting Bitcoin's efforts to discourage illicit use).

57. *Id.* (explaining logic behind criminals' affinity for cryptocurrency).

58. *See* Reiff, *supra* note 2 (describing shifting attitudes surrounding cryptocurrency as positive yet complicated).

59. Josias Dewey ET AL., *Blockchain & Cryptocurrency Reg.*, ASSOC. CORP. COUNSEL (2019), [https://www.acc.com/sites/default/files/resources/vl/membersonly/Article/1489775\\_1.pdf](https://www.acc.com/sites/default/files/resources/vl/membersonly/Article/1489775_1.pdf), at 485 (explaining mining's legality depends on where one lives).

60. *Id.* (explaining reciprocal nature of legality of mining and legality of possessing cryptocurrency).

In the United States, there are very few cities where cryptocurrency mining is illegal.<sup>61</sup> The cryptocurrency industry has established itself as a “legitimate and (potentially) world-changing space.”<sup>62</sup> Cryptocurrency’s increasing popularity and accessibility, however, will have devastating effects on the environment.<sup>63</sup>

### III. “I’LL GET YOU MY PRETTY” . . . AND YOUR LITTLE POWER GRIDS, TOO: THE INTERACTION OF CRYPTOCURRENCY AND THE ENVIRONMENT

Many are concerned about the energy requirements of cryptocurrencies.<sup>64</sup> As cryptocurrency enthusiasts mine the currency, miners need electrical energy to power their behemoth computer systems.<sup>65</sup> As the value of the currency increases, so does the energy required to mine it.<sup>66</sup> For example, miners may be able to extract their first Bitcoin for X watts of electricity, but it could take 100X watts to mine their tenth Bitcoin.<sup>67</sup> The enormous amount of energy required for the mining process is alarming because of cryptocurrency’s increasing prevalence and the difficulty of accurately estimating its environmental impact.<sup>68</sup> Moreover, cryptocurrency mining does not produce a physical product.<sup>69</sup> This lack of physicality is distinct from many other climate change contributors, such as deforestation and livestock farming.<sup>70</sup> It is thus perplexing to relate climate change to cryptocurrency, which makes it even more difficult to conceptualize the environmental impact of mining a digital currency.<sup>71</sup>

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61. *Id.* (stating Plattsburgh, New York is probably only U.S. city that has banned mining).

62. *See* Reiff, *supra* note 2 (highlighting cryptocurrency’s potential impact on banking).

63. *See* Samford & Domingo, *supra* note 6 (explaining devastating environmental effects of cryptocurrency’s rising popularity).

64. Reiff, *supra* note 2 (highlighting connection between cryptocurrency and environmental impact).

65. *Id.* (stating reason for large consumption of energy in cryptocurrency).

66. *Id.* (describing higher value coins use more energy).

67. *See id.* (providing example illustrating coin and energy relationship).

68. *Id.* (explaining difficulty of accurately calculating miners’ energy usage).

69. Rachel Whitt, *Environmental cost of cryptocurrency mines*, SCI. NEWS (Nov. 13, 2019), <https://www.sciencedaily.com/releases/2019/11/191113092600.htm> (noting cryptocurrency lacks physical product).

70. *See id.* (highlighting major difference between cryptocurrency mining and other climate change contributors).

71. *See id.* (stating difficulty of convincing people of cryptocurrency’s environmental impact).

Professor Benjamin Jones at the University of New Mexico recently investigated cryptocurrency's impact, describing its environmental costs as "substantial" and "larger perhaps than most people realize[ ]."<sup>72</sup> As described, cryptocurrency mining requires extensive amounts of electrical energy.<sup>73</sup> Based on the massive usage of electricity gained from burning fossil fuels, cryptocurrency is linked to worsening air quality and increased carbon dioxide emissions.<sup>74</sup> These emissions subsequently impact both local communities and global air quality.<sup>75</sup>

Independent miners also use specialized, energy-consuming computers with robust hardware that can function in any geographic location.<sup>76</sup> A recent study estimates cryptocurrency mining will lead to increased global temperatures.<sup>77</sup> Exact calculations, however, depend on the rate of technological incorporation.<sup>78</sup> Researchers have modestly framed cryptocurrency models to match the slowest rate of similar technologies' incorporation speeds.<sup>79</sup> At this slow rate, mining could produce enough emissions "to warm the planet above 2°C in just 22 years," meaning as soon as 2040.<sup>80</sup> If Bitcoin is incorporated at the average rate, the same result will occur by 2034.<sup>81</sup> Based on this research, experts advise that cryptocurrencies should be widely recognized as main contributors of emissions.<sup>82</sup>

Transportation, housing, and food are currently the main contributors to climate change.<sup>83</sup> These contributors are well-known and addressed through various campaigns to reduce greenhouse

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72. *Id.* (explaining researcher's quotation regarding cryptocurrency mining's impact).

73. U. Haw. Manoa, *Bitcoin can push global warming above 2 C in a couple decades*, PHYS.ORG (Oct. 29, 2018), <https://phys.org/news/2018-10-bitcoin-global-couple-decades.html> (stating Bitcoin mining depends on massive amounts of energy).

74. *See* Whitt, *supra* note 69 (stating mining's harmful air quality effects).

75. *Id.* (reiterating poor air quality's global impact).

76. *Id.* (explaining geography of mining and need for specialized computers).

77. *See* U. Haw. Manoa, *supra* note 73 (introducing study estimating Bitcoin's environmental impact).

78. *Id.* (explaining estimates depend on rate of technological incorporation).

79. *Id.* (describing estimates based on slowest rate of technological incorporation).

80. *Id.* (stating Bitcoin's impact on climate change based on slowest calculations).

81. *Id.* (reporting impact on climate change based on average rate of technological incorporation).

82. *See* U. Haw. Manoa, *supra* note 73 (outlining main contributors of climate change).

83. *Id.* (identifying main contributors of climate change).

gas emissions.<sup>84</sup> The problem with cryptocurrency is that decentralization makes it difficult to estimate energy consumption and damage.<sup>85</sup> Experts at the University of Hawai'i warn that future cryptocurrency development must "aim to reduce electricity demand[ ] if the potentially devastating consequences . . . are to be avoided."<sup>86</sup>

Researchers at the University of New Mexico coined the term "cryptodamages" to describe mining's negative environmental impact.<sup>87</sup> According to experts, cryptodamages are significant yet largely ignored.<sup>88</sup> And as more "coins" are created, "the rising electricity requirements to produce a single coin can lead to an almost inevitable cliff of negative net social benefit."<sup>89</sup> Specifically, researchers estimated in 2018 that every one dollar of Bitcoin resulted in \$0.49 of health and climate damages in the United States alone.<sup>90</sup> Again in 2018, researchers found that "the cost in damages that it took to create Bitcoin matched the value of the exchange itself."<sup>91</sup>

The damages from mining are created in the form of increased pollutants from the burning of fossil fuels to produce the necessary energy.<sup>92</sup> These pollutants include "carbon dioxide, fine particulate matter, nitrogen oxides, and sulfur dioxide."<sup>93</sup> Increased prevalence of these pollutants in the atmosphere has been positively linked to an increased risk of premature death.<sup>94</sup> Another serious problem associated with mining is that it can occur anywhere there is electricity at low costs, which further complicates regulation.<sup>95</sup> Miners that follow the cheapest energy sources have potential to

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84. *See id.* (comparing main contributors of climate change).

85. *Id.* (stating decentralization as major issue in combating energy consumption levels).

86. *Id.* (reiterating difficulty of accurately estimating cryptocurrency's impact).

87. *See* Whitt, *supra* note 69 (explaining term "cryptodamages" describes cryptocurrency mining's negative impact).

88. *Id.* (describing origin of term cryptodamages).

89. *Id.* (stating negative impact on human health and environment with each new mined coin). Decentralization is an important feature of cryptocurrency and differs from traditional or centralized banks in that there is less control by one authority to authorize transactions. *Id.* (explaining how transactions are published on blockchain for transparency).

90. *Id.* (reporting 2018 statistics of net social benefit of Bitcoin production).

91. *Id.* (quoting research expert connecting cost of damages from Bitcoin with value of exchange itself).

92. *See* Whitt, *supra* note 69 (reporting damages come in pollutant form).

93. *Id.* (stating specific pollutants that result from mining).

94. *Id.* (linking pollutants from mining cryptocurrency to premature death).

95. *Id.* (reiterating geographic problem of regulation of cryptocurrency).

make the most profit.<sup>96</sup> Unless regulators can predict where miners are likely to travel next, regulation remains extremely difficult.<sup>97</sup>

#### A. Cryptocurrency Disadvantages . . . Worse than Flying Monkeys

It is difficult to estimate the cryptocurrency industry's energy use because users are anonymous.<sup>98</sup> For an example of the size and scope of cryptocurrency's reach, by the end of 2018, it is estimated that Bitcoin "mining farms" consumed 0.05% of the world's energy.<sup>99</sup> Although this percentage seems slight, it is roughly the same level of energy consumption as countries like Ireland and Austria.<sup>100</sup> Bitcoin mining resulted in a total of fifty-three million dollars in revenue in 2017.<sup>101</sup> These exorbitant sums explain why miners flock to areas with the cheapest energy in order to create the greatest margins and earning potential from mining.<sup>102</sup>

To maximize profits, miners seek low cost electricity that exploits electric grids and depresses rural areas where energy costs are typically cheap.<sup>103</sup> For this reason, cryptocurrency mining is economically tied to geography.<sup>104</sup> Miners gravitate to areas with relaxed or unprepared regulatory policies and cheap energy, which helps them to maximize profits and continue mining for as long as their means allow.<sup>105</sup> Energy prices differ across the country based on three factors: (1) how much energy suppliers can sell to customers in the region, (2) how much energy suppliers buy from the national grid, and (3) how much local energy distributors charge suppliers.<sup>106</sup> Energy prices also tend to be cheaper where there are

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96. *Id.* (explaining tendency of miners to search for cheap energy).

97. *See* Whitt, *supra* note 69 (stating prediction of researchers that urge study into cheap energy areas).

98. *See* Dewey, *supra* note 59, at \*2 (citing anonymous nature of cryptocurrency as reason for regulation problems).

99. Samford & Domingo, *supra* note 6 (highlighting total energy consumption of Bitcoin).

100. *Id.* (comparing Bitcoin energy consumption to small European countries).

101. *See id.* (reporting total revenue of Bitcoin in 2017).

102. *Id.* (drawing conclusion as to why miners use low energy locales).

103. *See id.* (explaining connection to environmental effects).

104. Samford & Domingo, *supra* note 6 (linking cryptocurrency to geography).

105. *Id.* (connecting geography, underregulated policy locations, and miner exploitation).

106. *Why Do Energy Rates and Costs Differ By Region?*, USWITCH, <https://www.uswitch.com/gas-electricity/guides/why-are-energy-rates-different-by-region/> (last visited June 30, 2020) (stating reasons for differences in energy prices).

large supplies of oil or renewable energy sources.<sup>107</sup> Although miners are not completely convinced on the efficiency of renewable energy for their purposes, they tend to flock to areas where renewable energy is competitive so they can take advantage of cheap electricity.<sup>108</sup> When cryptocurrency miners flock to areas where energy is cheap, it results in a major, largely ignored environmental problem; it is unknown how to encourage miners to use renewable energy exclusively without price reductions.<sup>109</sup>

In places such as Washington's Mid-Columbia River Basin, cheap energy attracts ambitious miners, resulting in "mining heavy areas" that overburden public utility services.<sup>110</sup> In an article titled "This Is What Happens When Bitcoin Miners Take Over Your Town," one journalist outlined the effects of mining on a once-sleepy, rural Washington town.<sup>111</sup> The town originally attracted miners due to its proximity to the Columbia River, which presents immense hydropower potential.<sup>112</sup> Over the past three years, Bitcoin has seen significant fluctuations in value, jumping from \$1,000 to over \$19,000 per coin in 2017.<sup>113</sup> As a result, the Mid-Columbia Basin, composed of Chelan, Douglas, and Grant Counties, has "taken on the vibe of a boomtown."<sup>114</sup> The once predominantly agricultural community is now home to numerous bitcoin mines, operating out of everything from industrial-sized facilities to backyard sheds.<sup>115</sup> Miners' exploitation of the area's energy services has left customers with an overused and unworkable power grid.<sup>116</sup>

Currency experts, such as Bitcoin analyst Alex de Vries, believe the "most energy-efficient mining rigs possible would still use 13 terawatt hours of electricity in total."<sup>117</sup> As a comparison, this fig-

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107. See *id.* (comparing prices of energy to location of oil reserves).

108. Samford & Domingo, *supra* note 6 (concluding miners move to areas where electricity is cheap).

109. See *id.* (warning of mining's environmental impact).

110. *Id.* (illustrating exemplary case of Washington State Mid-Columbia River Basin).

111. Paul Roberts, *This is What Happens When Bitcoin Miners Take Over Your Town*, POLITICO (Mar./Apr. 2018), <https://www.politico.com/magazine/story/2018/03/09/bitcoin-mining-energy-prices-smalltown-feature-217230> (introducing article on invasive nature of mining).

112. *Id.* (stating relationship between mining and Columbia River).

113. *Id.* (reporting Bitcoin's fluctuation in value).

114. *Id.* (asserting small towns have transformed as result of emergence of cryptocurrency).

115. See Roberts, *supra* note 111 (explaining small towns are different and more industrialized from Bitcoin production).

116. See *id.* (showing effects of miner exploitation).

117. Reiff, *supra* note 2 (introducing bitcoin expert Alex de Vries).

ure is equal to the amount of energy that the entire country of Slovenia uses in the same period of time.<sup>118</sup> de Vries alludes profits concern most miners more than energy efficiency.<sup>119</sup> He predicts cryptocurrency's energy usage will continue to grow as the industry gains new entrants.<sup>120</sup>

There are currently competing views surrounding the overall positive or negative effects cryptocurrencies have on the environment.<sup>121</sup> Some research suggests that cryptocurrency mining is beneficial to the environment.<sup>122</sup> Experts opine cryptocurrency mining's dependence on fossil fuels, such as coal, naturally casts the mining process in a negative light.<sup>123</sup> These negative views, however, fail to mention that a majority of mining operations consume energy derived from renewable sources because of the low costs associated with renewable energy production.<sup>124</sup>

Despite potential environmental benefits, followers of the environmental debate over cryptocurrency may see arguments as tenuous for one reason.<sup>125</sup> These arguments assume that miners are rational actors who will begin to use renewable energy exclusively.<sup>126</sup> If miners began to use renewable energy exclusively, facilities that host crypto-mining activities could help subsidize the introduction of renewable energy resources.<sup>127</sup> It has been estimated approximately 77.6% of crypto-mining facilities use electricity from renewable sources while the remainder use fossil fuels and nuclear power.<sup>128</sup> It is important to stress the difficulty of verifying these figures due to the anonymous nature of the mining process

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118. *Id.* (highlighting extensive use of energy by mining rigs via comparison to Slovenia's energy consumption).

119. *See id.* (describing de Vries' hypothesis that energy consumption will continue to rise).

120. *See id.* (predicting that easier access to cryptocurrency will lead to increased energy consumption).

121. *See* Goodkind, *supra* note 28, at \*7 (alluding to positive or negative effects of cryptocurrency on environment).

122. *See* Samford & Domingo, *supra* note 6 (suggesting potential positive of cryptocurrency mining).

123. *Id.* (stating connection between cryptocurrency and fossil fuels results in negative public perception).

124. *Id.* (reporting crypto's potential positive impact on renewable energy).

125. *Id.* (introducing flaw in environmental argument for cryptocurrencies).

126. *See id.* (stating assumption necessary for argument to succeed).

127. Samford & Domingo, *supra* note 6 (describing subsidizing effect crypto-mining facilities would have on renewable resources).

128. *Id.* (noting CoinShares Research report regarding breakdown of mining electricity sources).

and the general unwillingness of miners to submit to regulation or oversight.<sup>129</sup>

If miners are acting out of self-interest, it is logical to assume they will use the cheapest energy available regardless of the environmental impact.<sup>130</sup> It will take a significant number of altruistic miners to jumpstart an industry-wide commitment to utilizing renewable energy sources.<sup>131</sup> Simply stated, miners have little incentive to use renewable energy because how much they pay for electricity directly correlates to how much they profit.<sup>132</sup> Despite some expert opinions to the contrary, the general consensus is that miners will continue to seek unregulated electricity markets because they are cheaper.<sup>133</sup>

Environmentally-conscious technologists are encouraging alternative production schemes for crypto-mining.<sup>134</sup> Miners choosing renewable energy use significantly less of it and, therefore, have lesser environmental impacts.<sup>135</sup> Publicizing both the harmful effects of traditional mining and the alternative renewable production schemes is crucial to the success of cryptocurrency moving forward.<sup>136</sup>

### C. China's Search for Courage to Effectively Regulate Cryptocurrency

China is a major figure in the cryptocurrency world and has a substantial amount of experience attempting to regulate it.<sup>137</sup> Home to several of the largest Bitcoin mining companies, China facilitates the most Bitcoin traffic in the world.<sup>138</sup> Statistically, China has been the originating country of eighty-five percent of all

129. *See id.* (highlighting difficulty of estimating figures related to mining's energy consumption).

130. *See id.* (supposing most miners act selfishly).

131. *See id.* (implying miners opting for costly renewable energy sources is unlikely).

132. Samford & Domingo, *supra* note 6 (concluding miners value cheap electricity regardless of its renewable nature).

133. *Id.* (rebutting argument that miners could become environmentally conscious without economic incentive).

134. *See* Whitt, *supra* note 69 (mentioning alternative schemes of mining that use less electricity).

135. *See id.* (connecting alternative schemes to reduced environmental impact).

136. *See id.* (noting publication about dangers of mining is important to future cryptocurrency success).

137. Bitmex Research, *supra* note 8 (stating China's dominant position and experience with cryptocurrency).

138. Samford & Domingo, *supra* note 6 (describing China's experience with cryptocurrency).

Bitcoin transactions.<sup>139</sup> In June 2019, the People’s Bank of China (PBOC) declared “it would block access to all domestic and foreign cryptocurrency exchanges and ICO websites.”<sup>140</sup> Despite cryptocurrency’s popularity in China, the PBOC deemed digital currencies illegal because they are unrecognized by monetary institutions and do not hold legal status as currency in China.<sup>141</sup> The PBOC is reportedly concerned about fraudulent tactics associated with the unlawful issuance of currencies, such as Ponzi schemes and multi-level marketing.<sup>142</sup>

China’s unsuccessful cryptocurrency regulation, however, may be partially due to regulators’ suspected ulterior motives.<sup>143</sup> Initial coin offerings (ICO) are cryptocurrency-based fundraising efforts that became illegal in China in September 2017.<sup>144</sup> The ban on ICOs resulted in a six percent decline in Bitcoin prices.<sup>145</sup> The PBOC specifically declared a new commitment to “clamp down on all cryptocurrency trading” and completely ban foreign exchanges.<sup>146</sup> Although China repeatedly asserts its efforts to regulate cryptocurrency are based on the belief that cryptocurrency mining results in “wasted resources,” PBOC is attempting to create its own blockchain currency, casting doubt on this purported motivation.<sup>147</sup> PBOC is attempting to create its own version of blockchain currency.<sup>148</sup> China wants to benefit from the technology behind cryptocurrency while simultaneously preventing

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139. *Id.* (reiterating dominance with statistical figures of Bitcoin transactions).

140. Shobhit Seth, *Is Bitcoin Banned in China?*, INVESTOPEDIA, <https://www.investopedia.com/news/bitcoin-banned-china/> (last updated June 25, 2019) (explaining China’s new strategy in dealing with environmental impact of cryptocurrency). The People’s Bank of China (PBOC) is the central regulatory authority in China and regulates financial institutions by drafting monetary policies. *Id.* (describing PBOC).

141. *Id.* (stating why PBOC disfavors cryptocurrency).

142. *Id.* (explaining regulatory authorities’ fraud concerns).

143. Roger Huang, *China’s Proposal To Ban Cryptocurrency Mining Has Little to Do With the Environment*, FORBES, <https://www.forbes.com/sites/rogerhuang/2019/04/25/chinas-move-to-ban-cryptocurrency-mining-has-little-to-do-with-the-environment/#2a253bc946ed> (last updated Apr. 25, 2019, 7:19 PM) (alluding to unsavory motives of Chinese authorities).

144. Seth, *supra* note 140 (describing initial coin offerings).

145. *Id.* (stating impact of ban on ICO).

146. *Id.* (describing PBOC’s intent to ban foreign cryptocurrency exchanges).

147. Huang, *supra* note 143 (suggesting China has selfish motive in regulating cryptocurrency).

148. *Id.* (stating China’s possible intention to use blockchain technology for its own purposes).

cryptocurrency enthusiasts and prominent miners from using it.<sup>149</sup> It appears that China's commitment to stifling the spread of cryptocurrency involves motivations beyond environmental protection.<sup>150</sup>

China became wary of the intense mania surrounding Bitcoin because of its non-regulated nature.<sup>151</sup> As a result, China claimed that it cracked down significantly on cryptocurrencies to decrease fraud.<sup>152</sup> Unfortunately for China, the PBOC's actions, such as the ICO ban, were not sufficient to eliminate cryptocurrency mining altogether.<sup>153</sup> Mining has continued in China, but miners have switched to foreign exchanges and deal in digital currencies underground.<sup>154</sup> In reaction, the PBOC again tightened restrictions by placing more severe regulations on domestic dealers engaging in foreign currency transactions.<sup>155</sup> The PBOC has also banned Chinese financial institutions from funding any activities that encourage innovation in cryptocurrency.<sup>156</sup>

The effectiveness of China's most recent bans has been the subject of debate.<sup>157</sup> The very nature of cryptocurrency depends on unregulated users who are independent from official government oversight.<sup>158</sup> Regulators, therefore, will continue to be challenged by creative and resolute miners who wish to deal in cryptocurrency in China.<sup>159</sup> Bobby Lee, CEO and co-founder of the world's longest running cryptocurrency exchange, was forced to close Chinese operations as a result of the bans but stated, "[i]t's only a matter of time before China lifts the crypto exchange ban."<sup>160</sup> Lee further expressed optimism and confidence the "resilient nature of cryptocurrencies [would] enable them to spring back following

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149. *Id.* (explaining that increased regulation would eliminate established miners and allow government to use technology as they please).

150. *Id.* (stating environmental protection is not China's primary motivation behind regulation of cryptocurrency).

151. *See* Seth, *supra* note 140 (illuminating connection between Chinese fears of cryptocurrency and its decentralized nature).

152. *Id.* (connecting Chinese fears with concerns of fraud).

153. *See id.* (highlighting China's lack of success in initial crackdown).

154. *Id.* (describing cryptocurrency miners' response to regulation).

155. *See* Seth, *supra* note 140 (explaining PBOC's response to ban more cryptocurrency related activities).

156. *Id.* (stating PBOC's additional measures to discourage mining).

157. *Id.* (highlighting debate surrounding ineffectiveness of PBOC measures).

158. *See id.* (describing cryptocurrency's nature as adverse to regulation).

159. *See id.* (forecasting Chinese regulators' continued struggle).

160. *See* Seth, *supra* note 140 (stating lack of distress by some miners following recent bans).

more regulation.”<sup>161</sup> Cryptocurrency is successful underground in China, so many predict even the most stringent regulation will still be unsuccessful.<sup>162</sup> The reason why China is unlikely to eliminate domestic mining of cryptocurrency completely lies in the ample opportunities to exploit cheap electricity.<sup>163</sup> Cheap electricity is an essential ingredient to cryptocurrency mining, and the reason why it is so exploitative to certain regions.<sup>164</sup>

#### IV. THERE’S NO PLACE LIKE HOME, THERE’S NO PLACE LIKE HOME: PROTECTING THE UNITED STATES MOVING FORWARD

With the inception of any new technology, the United States’ government must determine how best to regulate the technology.<sup>165</sup> Cryptocurrencies, therefore, have received significant attention from both federal and state agencies in the United States.<sup>166</sup> This attention has led to several disputes regarding which agencies are responsible for handling the confusing and nuanced area of cryptocurrency regulation.<sup>167</sup> Agencies such as the Securities and Exchange Commission (SEC), the Commodities and Futures Trading Commission (CFTC), the Federal Trade Commission (FTC), the Internal Revenue Service (IRS), and the Financial Crimes Enforcement Network (FinCEN) have all regulated cryptocurrencies in some capacity.<sup>168</sup> Although these large, resource-laden agencies have attempted to address the problems facing cryptocurrencies, there has been little official regulation.<sup>169</sup>

“The U.S. legal system is set up to respond to issues through the lens of a specific event and legal case.”<sup>170</sup> Instead of proactively releasing broad regulations, the approach of many other countries, U.S. policymakers are more likely to take a reactive approach.<sup>171</sup>

161. *Id.* (predicting cryptocurrency miners’ success should bans be lifted).

162. *See id.* (forecasting unsuccessful attempts to eliminate mining completely).

163. *Id.* (connecting electricity to cryptocurrency operations).

164. *See id.* (emphasizing electricity as essential ingredient to mining).

165. *See Cryptocurrency Rules and Regulations You Should Know, supra* note 23 (stating new technology forces US government to craft regulations).

166. *See Dewey, supra* note 59, at 479 (explaining cryptocurrency attention from federal and state agencies).

167. *Id.* at 2 (stating agencies have grappled with appropriate placement of responsibility for cryptocurrency).

168. *Id.* at 479 (listing agencies involved with cryptocurrency regulation).

169. *Id.* (noting lack of official rulemaking despite involvement from powerful agencies).

170. *Cryptocurrency Rules and Regulations You Should Know, supra* note 23 (explaining regulatory process in United States).

171. *Id.* (describing regulators’ non-reactive nature).

Policymakers in the case of cryptocurrency are creating a “regulatory landscape . . . as issues arise” on a case-by-case basis.<sup>172</sup> Agencies and policymakers support cryptocurrency because they see the need for the United States to be an involved competitor on the world stage.<sup>173</sup> They also see an opportunity for cryptocurrency to play an important role in the United States’ future infrastructure.<sup>174</sup> For the United States to gain a competitive advantage in the cryptocurrency realm, it must refrain from over-regulating to keep miners working domestically.<sup>175</sup>

Federal agencies often disagree over how to classify cryptocurrency.<sup>176</sup> The IRS categorizes cryptocurrency as “assets or property, which means that capital gains taxes apply.”<sup>177</sup> The SEC, on the other hand, considers some cryptocurrencies to qualify as securities, meaning federal securities laws apply to them.<sup>178</sup> The CTFC defines Ether — one type of cryptocurrency — as a commodity, which can be traded on United States markets, subject to its regulations.<sup>179</sup> Congress introduced more than twenty bills related to cryptocurrency in 2019, following two bills in 2018 that specifically addressed accelerating the regulation process.<sup>180</sup> Cryptocurrency, however, is not currently considered “legal tender” anywhere in the United States.<sup>181</sup> Agencies have conceded that policymaker regulations could scare miners overseas and drive potentially beneficial investment out of the United States.<sup>182</sup>

Despite the uncertainty surrounding cryptocurrency’s potential effects, states have approached regulation positively.<sup>183</sup> Several state governments have passed favorable legislation that benefits

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172. *Id.* (stating nature of cryptocurrency regulations).

173. *See Dewey, supra* note 59, at \*479 (recounting policymaker encouragement for cryptocurrency to be world competitor in technology).

174. *Id.* at 479 (explaining attention to cryptocurrency as possible infrastructure supporter).

175. *Id.* at 479 (stating importance of not over-regulating industry).

176. *See Cryptocurrency Rules, supra* note 23 (explaining federal government disagree over cryptocurrency’s proper governing regulations).

177. *Id.* (using IRS example of how it defines cryptocurrency).

178. *Id.* (citing how SEC defines cryptocurrency).

179. *Id.* (describing how CTFC defines currency).

180. *Id.* (stating Congress’s recent bill count on cryptocurrency).

181. *See Cryptocurrency Rules, supra* note 23 (reporting lack of consensus surrounding state definition and legitimacy of crypto).

182. *See Dewey, supra* note 59, at \*479 (describing possibility of driving miners out of United States due to over-regulation).

183. *See id.* (highlighting unsure nature of cryptocurrency and corresponding reactions of state governments).

cryptocurrency.<sup>184</sup> Favorable regulations often include an exemption from state securities laws or money transmission statutes.<sup>185</sup> The intent of these regulations is to encourage investment in cryptocurrency's technology that stimulates the local economy, and, in turn, improves public services.<sup>186</sup> For example, Wyoming has been celebrated as one of the most supportive jurisdictions of cryptocurrency.<sup>187</sup> The state recently passed a bill "exempting cryptocurrencies from property taxation."<sup>188</sup> Cryptocurrency enthusiasts have also praised Colorado for its bipartisan bill "promoting the use of blockchain for government record-keeping."<sup>189</sup>

#### V. CONCLUSION: WILL CRYPTO MINERS FIND THEIR HEARTS?

Energy used to mine cryptocurrency is increasing the amount of greenhouse gas in Earth's atmosphere.<sup>190</sup> Both Wyoming and New York legislators — who have polarizing views on cryptocurrency mining — agree on this point.<sup>191</sup> Advocates of cryptocurrency, who believe it has potential to encourage the use of more sustainable energy, as well as those who believe it has no redeeming environmental qualities, concede that cryptocurrency affects the environment, they just disagree whether the impact is negative or has the potential to be positive.<sup>192</sup> The carbon footprint of mining cryptocurrency is the same as Denmark's carbon footprint and —

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184. *See id.* (stating state government either take positive or negative approach when regulating).

185. *Id.* (supplying examples of pro-cryptocurrency regulations).

186. *See id.* (explaining some states' rationale for pro-cryptocurrency policies).

187. Dewey, *supra* note 59, at \*479 (describing Wyoming as crypto-friendly state).

188. *Id.* (stating crypto exemption from property taxes in Wyoming).

189. *Id.* (adding Colorado's pro-cryptocurrency actions).

190. Tebany Yune, *How cryptocurrency is contributing to climate change*, MIC (Nov. 21, 2019), <https://www.mic.com/p/how-cryptocurrency-is-contributing-to-climate-change-19371878> (reporting cryptocurrency has definite effect on climate change).

191. *See* Kellie Mejdrih, *Wyoming — yes, Wyoming — races to fill crypto-banking void*, POLITICO (Nov. 21, 2019, 6:19 PM), <https://www.politico.com/news/2019/11/21/wyoming-cryptocurrency-banking-072727> (explaining difference between states' approaches to cryptocurrency while acknowledging impact on environment). Wyoming has been hailed as a cryptocurrency haven in its attempts to attract "a small fortune" in cryptocurrency assets from companies who do not value federal oversight. *Id.* (stating Wyoming's approach to regulation). The Wyoming bank model provides digital currency businesses an avenue to reach customers in New York while avoiding the state's strict regulations. *Id.* (illustrating stark contrast between Wyoming and New York cryptocurrency regulation).

192. *See* Samford & Domingo, *supra* note 6 (explaining impact of cryptocurrency is not disputed by either side of debate).

as previously stated — the process consumes more energy than some countries.<sup>193</sup>

According to the International Energy Agency, if Bitcoin were a country it would rank between Switzerland and the Czech Republic, ranks forty-four and forty-two respectively, in terms of energy consumption.<sup>194</sup> This again begs the question of why more people are not utilizing legal or legislative action to curtail these effects.<sup>195</sup> There are, however, multiple ways to rationalize this reality.<sup>196</sup>

Cryptocurrency is a difficult concept to grasp for the average citizen.<sup>197</sup> Describing digital currency may be challenging because of inherent complexities, including how it is traded and how it is mined.<sup>198</sup> Even assuming cryptocurrency can be explained in a succinct and understandable manner, the next task is to tie cryptocurrency to greenhouse gas emissions and irresponsible energy usage.<sup>199</sup> All supporting data also requires caveats based on the anonymous, incalculable quality of cryptocurrency usage and mining.<sup>200</sup>

To estimate the environmental effect of mining accurately, one needs to know “the power requirement of the Bitcoin network” and “where this power is coming from.”<sup>201</sup> So, even when environmental advocates get in front of the right group of people, admitted uncertainty in their calculations weakens their positions.<sup>202</sup> Conversely, this effect supports “wait and see” approach advocates who believe cryptocurrency mining will eventually increase usage of re-

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193. See Yune, *supra* note 190 (comparing Bitcoin’s energy usage to Denmark’s).

194. *Bitcoin Energy Consumption Index*, DIGICONOMIST, <https://digiconomist.net/bitcoin-energy-consumption> (last visited Aug. 4, 2020) (charting energy consumption of Bitcoin relative to countries around world).

195. See *id.* (explaining difficulty of estimating environmental impact due to lack of information).

196. See Reiff, *supra* note 2 (stating multitudes of rationalizations for and against regulation).

197. See *id.* (discussing complications that inhibit cryptocurrency from being understood).

198. See *id.* (describing difficulty of explaining crypto process).

199. See *generally id.* (describing difficulty of translating environmental effects of cryptocurrency).

200. See *id.* (showing information necessary to explain issues is not always available).

201. *Bitcoin Energy Consumption Index*, *supra* note 194 (stating difficulty in estimating impact due to lack of location information).

202. *Id.* (showing lack of confidence in presented data leads to less action by regulators).

newable energy sources.<sup>203</sup> The lack of data to the contrary further strengthens their argument.<sup>204</sup> These competing arguments not only illustrate why federal administrative agencies cannot agree on a classification of cryptocurrency, but also why there are so few regulations governing the cryptocurrency mining process.<sup>205</sup> The critical lack of definitive information surrounding cryptocurrency is ultimately why some states and the federal government have not taken more decisive steps to regulate cryptocurrency or cryptocurrency mining.<sup>206</sup>

Unfortunately, China does not serve as a reliable case study for legislators and regulators in the United States.<sup>207</sup> Undoubtedly, China has the most experience with cryptocurrency trading and mining.<sup>208</sup> China has tried multiple approaches to regulate Bitcoin as a currency and to curtail its mining.<sup>209</sup> Although China stated its attempts to ban cryptocurrency and mining were based on the environmental effects, many experts believe this is a false motive.<sup>210</sup> Based on its actions, China is more likely attempting to eliminate competition in the cryptocurrency sector to capitalize on the underlying technology.<sup>211</sup> Unless the United States government intends to do the same, legislators and regulators, at both the federal and state levels, will need to forge their own respective paths.<sup>212</sup> The United States must decide if it wants to embrace cryptocurrency and mandate renewable energy use, or else allow decentral-

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203. See Samford & Domingo, *supra* note 6 (displaying opposite side of argument to regulators).

204. See *id.* (exhibiting weakened arguments as result of lack of “regulation and oversight”).

205. See Dewey, *supra* note 59, at \*479 (exemplifying lack of administrative agency cohesion).

206. For a further discussion of state and federal government treatment of cryptocurrency regulation, see *supra* notes 176-89.

207. For a further discussion of China’s approach to cryptocurrency regulation, see *supra* notes 137-64.

208. See Seth, *supra* note 140 (stating Chinese experience with cryptocurrency is unparalleled).

209. *Id.* (explaining Chinese attempts to regulate and manage Bitcoin).

210. See Huang, *supra* note 143 (alluding to false Chinese motives in connection with cryptocurrency regulation).

211. *Id.* (stating rationale for Chinese government hiding true motive of cryptocurrency regulation).

212. See Samford & Domingo, *supra* note 6 (highlighting difficult position of United States regulators).

ized cryptocurrency miners to continue on their current path of environmental degradation.<sup>213</sup>

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213. *See id.* (explaining choice United States regulators face with cryptocurrency issues and consideration of “ways to curb rouge operators while maintaining balance between public safety and economic development[ ]”).

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