

ABLs, Bitcoin Miners and Monetizing Stranded Energy

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This article discusses the bitcoin mining industry's role in providing demand support to energy producers by monetizing otherwise stranded energy produced from oil drilling and solar and wind facilities. Consumption of stranded energy by bitcoin miners should help secured lenders underwrite loans, because it can reduce air pollution resulting from natural gas flaring and improve life cycle economics of renewable energy sources.

It is very difficult to get a senior credit officer comfortable with bitcoin. Utter the words “bitcoin mining” to a group of asset-based lenders and it will not likely go over well. How has a working-capital intensive, increasingly carbon-neutral, industry with hundreds of millions of dollars of equipment, accounts receivable and real estate, received practically zero debt capital from any secured lender?

Most likely, because bitcoin carries a stigma that it is (i) a mechanism for fraud used by unscrupulous executives to purchase homes in the Bahamas,¹ (ii) inherently worthless without backing by “real” assets or a central bank,² (iii) a device for criminal misconduct,³ (iv) a Ponzi scheme,⁴ (v) “probably rat poison squared,”⁵ and (vi) a massive waste of energy resources and deleterious to the environment that will inevitably cause the industry to enter a spiral of decline and losses.⁶ The merits and value of the above are yet to play out in the open-market, and the reality is more complex. However, it is this last critique which will be addressed herein. This article argues that bitcoin miners offer energy producers consistent, reliable demand support for wasted energy generated from oil drilling and solar and wind facilities (such energy, as described below, “stranded energy”). Consumption of stranded energy by bitcoin miners should help secured lenders underwrite loans, because it can reduce air pollution resulting from natural gas flaring and improve life cycle economics of renewable energy sources.

The rise of bitcoin mining has sparked debate about its energy consumption and environmental impact. Some say that it has negative attributes when evaluated through the lens of climate related risk methodologies, while others insist that it’s a workable investment opportunity with positive energy and climate externalities. This article suggests that by optimizing stranded energy, bitcoin miners can reduce the amount of greenhouse gas emissions caused by drilling oil wells and improve rates of return on renewable energy production. More importantly, once the negative energy use and environmental stigma begins to unravel, asset-based lenders may realize a traditional borrowing base can be built with these companies’ assets just like any other mainstream industry. This discovery would lead the asset-based lending arms of banks, finance companies, and financing subsidiaries of major industrial corporations to many opportunities to extend first-lien, senior secured debt capital to an industry operating in the physical world.

To understand how bitcoin miners can reduce air pollution and improve life cycle economics of renewable energy sources, bitcoin mining and the concept of stranded energy needs unpacking.

Bitcoin Mining Basics

The purpose of bitcoin mining is to verify transactions that take place on the bitcoin network.⁷ The bitcoin network operates 24 hours a day, 7 days a week, 365 days a year.⁸ Miners receive newly created bitcoins as an incentive for verifying transactions approximately every ten minutes.⁹ The only things needed to mine bitcoin are – power, specialized computers (i.e., ASICs)¹⁰ and an internet connection. ASICs cost approximately \$2,000 each and are readily available for purchase online.¹¹ Mining can be small scale like the six-month Fort Worth pilot

program that netted the city \$1,019.31 in profit,¹² or institutional-scale like Riot Platforms, Inc., a NASDAQ listed miner (ticker: RIOT), that reported net revenue of \$184 million in FY 2021 from mining bitcoin.¹³ Generally, miners have two different revenue streams: (1) bitcoin mining and (2) hosting fees.¹⁴ For bitcoin mining, bitcoins received are either sold on the open market for cash or held on the miner’s balance sheet.¹⁵ In contrast, hosting acts more like traditional accounts receivable – miners receive cash payments in exchange for providing an account debtor with access to a portion of the miner’s electrical power.¹⁶ These account debtors are typically other bitcoin miners looking for access to cheap power. For example, at Riot’s 700MW capacity facility in Rockdale, Texas, a portion of the ASICs are owned by Riot and the rest are either owned or leased by Riot’s account debtors which pay it a hosting fee for access to power.¹⁷

Importantly, bitcoin is easy to mine. Fort Worth is mining bitcoin in the basement of city hall.¹⁸ The ability to operate 24-7-365 virtually anywhere there is power and an internet connection, combined with the surplus of stranded energy discussed below, makes bitcoin miners unique consumers of power.

Bitcoin Miners Exploit Stranded Energy

Every energy producer – solar, wind, geothermal, landfill gas, hydro, coal, and O&G has plenty of energy that is produced, but has nowhere to go.¹⁹ This type of already-produced energy with no buyer is called stranded energy. Bitcoin miners, willing to travel to remote locations in search of the cheapest available electricity, exploit stranded energy.²⁰ Over the last 50 years and most recently with Joe Biden’s signing of the Inflation Reduction Act in August 2022, the United States has invested heavily in O&G, wind and solar production, contributing significantly to its production of stranded energy.²¹

O&G

O&G earned its namesake because when an oil well is drilled, both oil and gas (i.e. methane (CH₄)) are extracted. As a liquid, extracted oil can be transported via truck, rail or pipe.²² As a gas, extracted methane can only be transported via pipe.²³ For logistical reasons, a freshly drilled well is not likely to have a gas pipeline installed to transport the methane to a purchaser for months or years, if at all. So, oil drillers need to figure out what to do with the methane (i.e. stranded energy) that, if released into the atmosphere, is 25x more damaging to the environment than carbon dioxide (CO₂).²⁴ As a result, and as required by state regulators, oil drillers burn off the methane via flaring, which converts approximately 91.1% of the methane to CO₂ (see picture [below]).²⁵ Drive to Midland, Texas at night and there’s no need for headlights because there is so much flared gas. Now, instead



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of lighting stranded energy on fire, bitcoin miners can optimize this methane by converting it into electricity.

In the O&G context, a bitcoin miner will pipe already-produced methane from an oil well through a generator (see picture [below]), each costing approximately \$500,000, to produce electricity used to power an onsite trailer filled with ASICs.²⁷ That internet-connected trailer uses the electricity to mine bitcoin. It's a win-win for oil drillers as they no longer need to flare methane and have a purchaser of stranded methane energy converting it to CO₂ (potentially) more efficiently than flaring.²⁸ On the one hand, flares are only effective at destroying 91.1% of methane. On the other hand, bitcoin miners,²⁹ by installing equipment at oil wells, can destroy a higher percentage of methane than flares, thereby reducing greenhouse gas emissions.

Accordingly, oil majors, such as ExxonMobil (ticker: XOM) and ConocoPhillips (ticker: COP), under pressure to reduce carbon emissions resulting from flared gas, have partnered with bitcoin mining companies on projects globally.³⁰ For example, since January 2021, ExxonMobil has been working with Crusoe Energy Systems Inc., a bitcoin miner backed by Valor Equity Partners, to mitigate flared gas carbon emissions on its wells.³¹ To be clear, these generators still emit carbon, but according to Crusoe's internal reports, this approach results in a 63% CO₂-equivalent reduction relative to continued gas flaring.³² Independent reports are needed to confirm the CO₂ and greenhouse gas reduction. But, as demand for oil is not going away anytime soon, if converting stranded methane energy results in lower air pollution, it's a net positive for the environment.



Oil drillers burn off the methane via flaring, which converts approximately 91.1% of the methane to CO₂



Bitcoin methane/oil well generator

Solar & Wind

Similar to oil wells, bitcoin miners can optimize stranded solar and wind energy. Renewable energy power generation, such as solar and wind facilities, typically require grid connection via an interconnection agreement.³³ After a solar or wind facility executes an interconnection agreement and begins supplying power to the grid, transmission lines are not always capable of delivering the aggregate amount of power

generated by each facility to places where power is typically consumed, such as in large metropolitan areas. In other words, the location where solar and wind power is produced, is not always near the location such power is demanded. For instance, the windy High Plains region of northwest Texas covers nearly 40,000 square miles and has over 11,000 wind turbines, enough to power 9 million homes.³⁴ But, because of transmission constraints, the High Plains region does not have the infrastructure to move all the wind-generated power from High Plains to areas with high levels of power consumption, such as Austin, Dallas, and Fort Worth.³⁵ The result is stranded energy – a wind facility having more energy than the transmission line/power grid can handle – forcing the renewable facility operator to curtail power (i.e. purposefully shutting off power production). As a matter of fact, in 2021, Texas curtailed 4,150 gigawatts (GWs) of wind power and in April 2022, California curtailed 596 GW of wind and solar.³⁶

Bitcoin miners offer an alternative to renewable power curtailment. As discussed above, bitcoin

miners can operate virtually anywhere there is power and an internet connection. Unlike power consumed by individuals living and working in large metropolitan areas, bitcoin miners' energy consumption is location agnostic. As such, instead of a wind or solar facility curtailing power because stranded energy has nowhere to go, bitcoin mines can

be co-located adjacent to these facilities and use existing renewable electricity that would otherwise be curtailed. These types of business arrangements (i.e. renewable energy producers selling stranded energy to bitcoin miners) are becoming increasingly common because they (i) supply bitcoin miners access to cheap electricity, (ii) stabilize the renewable project's revenue stream and (iii) improve the renewable project's return on investment. For example, in July 2022, Lancium Balancing Energy, a Houston-based bitcoin miner, announced a partnership with Broad Reach Power (backed by Apollo and EnCap) that owns a 21GW portfolio of utility scale solar (see picture [below]), wind and storage projects.³⁷

Further, in October 2022, Aspen Creek Digital Corporation, a California technology company, revealed plans to build 3GW of solar, wind and energy storage by 2025 to power bitcoin mining facilities in Colorado and Texas.³⁸

Therefore, the bitcoin mining industry's consumption of otherwise stranded energy can help improve the life cycle economics of renewable energy sources. By monetizing stranded energy, bitcoin miners offer renewable energy producers consistent, reliable demand support for power that helps to reduce the cost of production. Instead of curtailing renewable energy when the transmission line/ power grid is maxed out, solar and wind generators may instead leave facilities running with bitcoin miners buying the otherwise stranded renewable energy. By reducing the cost of production, these renewable energy projects become more attractive to financiers, which can lead to increased investment and more widespread adoption.

Conclusion

The narrative that bitcoin mining is a massive waste of energy resources and harmful to the environment is becoming increasingly difficult to sustain. While it is true that the industry's energy consumption has some potential negative climate attributes, these may be balanced through the use of stranded energy. Bitcoin miners offer a valuable opportunity for energy producers to ameliorate their environmental impact and support their operations. By consuming otherwise stranded energy, bitcoin miners can reduce the amount of air pollution caused by natural gas flaring and supply a consistent, reliable source of demand support for wind and solar facilities thus improving the life cycle economics of renewable energy sources.

Once asset-based lenders receive the mandate to evaluate a bitcoin mining company, one could point underwriters to the fact that bitcoin

held for longer than three years has never lost an investor money, the value of tangible assets, such as generators converting methane into electricity, ASICs and related real assets, the value of intangible assets, such as cash payments and power credits from retail electricity providers in exchange for curtailing operations³⁹ and the aggregate amount of accounts receivable from hosting services agreements. For example, Riot's December 14, 2022 Investor Presentation filed with the SEC indicates that, as of September 30, 2022, it has:

- LTM revenue: \$290 million from mining and selling bitcoin, hosting service payments received from other miners and electrical equipment engineering,
- Property & Equipment: \$276 million,
- Cash on hand: \$255 million,
- Bitcoins on balance sheet: 6,897,
- Debt: \$0.⁴⁰



Lancium Balancing Energy, utility scale solar

In terms of taking bitcoin as collateral, the amendments to the Uniform Commercial Code addressing digital assets are set to be promulgated by the states in 2023. The lawyers that took part in drafting such amendments understand the nuances and have the technical skills to

perfect the bank's security interest in bitcoin held on balance sheets. Over time, asset-based lenders may find in the Chapter 11 context, liquidating bitcoin held as collateral with a third-party custodian is much simpler than foreclosing on traditional types of collateral, such as inventory, equipment and real estate.

And for those still not convinced, tune in to Session 7 of SEC Chair Gary Gensler's MIT Sloan School of Management course Blockchain & Money lecturing graduate students on whether bitcoin mining is a good use of energy resources. Chair Gensler notes, "[Bitcoin mining] also has a bunch of energy consumption. . . One estimate is that it is 200 million kilowatt hours per day. . . That's 1/3 of 1% of all the world's electricity. . . It's the electricity of the country of Austria. . . But it also costs a lot of money to run the banking system. So I think that when someone says, well, it's terrible, it's challenging, all this electric costs. Yes, we always want to lower costs. But the US financial system is 7.5% of our economy and costs \$1.5 trillion. So the payment system around the globe costs 0.5% to 1% of the global economy which is more than 1/3 of 1% of the world electricity costs. . . I see [bitcoin mining] as a trade-off."⁴¹ If the industry's power consumption has deemed approval from top brass at Wall Street's watchdog, it's worth taking a closer look. ■

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