

The Banking & Payments Show: Crypto—Earth’s heated currency gamble

Audio

On today’s episode, we discuss the environmental impact of blockchain technology and cryptocurrency mining. In our “Headlines” segment, we discuss the deal Bitdeer, a Bitcoin-mining company in Texas, had with the state when the power grid became distressed during the winter of 2021 and how crypto must overcome its reliance on old technologies that pollute the environment. In “Story by Numbers,” we discuss a 2022 report conducted by

climate and economic researchers that estimates Bitcoin mining may be responsible for 65.4 megatons of carbon dioxide per year, comparable to the entire country of Greece. And in “What If,” we examine what would happen to crypto if governments around the world required carbon tax credits in order to operate and restrictions were put in place for the amount of energy crypto and blockchains consume. Join the conversation with host Rob Rubin and our analysts Jenna McNamee and David Morris.

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Episode Transcript:

Rob Rubin:

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Jenna McNamee:

Incumbent banks especially. It's a proprietary move, I think I would say. In the US, we talk about how regulators are urging banks to isolate crypto exchanges, but these banks are, then, taking that as an opportunity to say, "Hey, I'm going to develop my own blockchain, and it's going to be ours, and we're not going to have to deal with an exchange." Or, "We're not going to have to deal with some third party provider giving us a blockchain. We're going to work to develop it so that it's ours."

Rob Rubin:

Hello, everyone, and welcome to the Banking and Payment Show, a Behind the Numbers podcast from eMarketer. Today is June 27th. I'm Rob Rubin, GM of Financial Services and your host today. If you enjoy this podcast, please give us a five star rating and subscribe. The title of today's episode is Crypto: Earth's Heated Currency Gamble. I invited Jenna McNamee and David Morris back to talk about the environmental impact of digital mining of crypto and all blockchain, and its impact on the market overall. Hey, Jenna. Hey, Dave. How you doing?

Jenna McNamee:

Hey, Rob.

David Morris:

Hey, Rob. How are you?

Rob Rubin:

I'm great today. Before we get into it, Jenna, I've done this twice already with David. Are you ready for some quickfire questions?

Jenna McNamee:

All right. Bring it on.

Rob Rubin:

Where do you live?

Jenna McNamee:

I am out of Philadelphia, Pennsylvania.

Rob Rubin:

So, I know the answer to this, but I'm going to ask. Do you ever go into the office?

Jenna McNamee:

I do not. I have never been into the office.

David Morris:

I've never been. A never beener.

Jenna McNamee:

A never beener.

Rob Rubin:

A never beener. David, have you ever been to the office?

David Morris:

I, too, am a never beener.

Rob Rubin:

All right.

David Morris:

Yeah. When you're from Chicago, it's a long walk to New York.

Rob Rubin:

Yeah. Jenna, since you've been in Insider Intelligence, what's your favorite article that you've ever written? Do you have one?

Jenna McNamee:

Oh, my favorite article that I've ever written. I don't think I have any favorite articles, but this is going to make me sound like a big nerd. I love writing about regulation.

Rob Rubin:

That's okay.

Jenna McNamee:

Yeah. I love writing about regulation, so I'm just a big nerd.

Rob Rubin:

There you go. Well, I'm going to take you on a different question now. When you eat cake, do you use a fork or a spoon?

Jenna McNamee:

A fork. A spoon? Who uses a spoon to eat cake?

Rob Rubin:

I would say if it's heavy on the frosting, I might go for a spoon.

Jenna McNamee:

Oh, well, what I do is I eat the cake part first, and then I eat the frosting last.

Rob Rubin:

All right. Well, we've learned a lot about you today already, and that was a lot of fun. We have a lot to cover, so let's get right to the headlines.

In the headlines, we chat about a top story as it relates to our episode, and I've chosen a story from the New York Times that got my attention because it compared the amount of electricity consumed by Bitcoin mines to how much electricity whole states consume. A Bitcoin mining company in Texas, Bitdeer, has a deal with the state that enables the state to order them to shut off their computers when the Texas power grid is stressed. And during a bad storm a few years ago, Texas had Bitdeer shut down for four days at a pre-agreed rate of \$175,000 an hour, and they made \$18 million from the Texas taxpayers over four days.

That's unbelievable to me. Also, in Texas, another Bitcoin mining farm, called Riot Platforms, reportedly consumes as much electricity as the nearest 300,000 households. And when you put Riot and Bitdeer together, and they are near each other, actually, physically, they consume more electricity than all the homes within a 40-mile radius of them. That is really big. So, aside from having now to overcome consumer trust from all the crypto exchange shenanigans, this tech enabled form of currency also has to overcome its reliance on old technologies that spew carbon dioxide into the environment. So, let's discuss why Bitcoin consumes so much energy, and what alternatives may already exist.

Jenna McNamee:

Sure, Rob. So, when you think about a crypto asset, it's a decentralized currency. So, crypto exchanges need a way to verify the validity of a crypto transaction, and the way they do that is by using what's called a consensus mechanism. So, there's two very popular consensus mechanisms that the most popular cryptocurrencies use, and they are proof of work and proof of stake. Let's, first, talk about proof of work.

Rob Rubin:

All right.

Jenna McNamee:

That's the consensus mechanism that Bitcoin uses.

Rob Rubin:

Okay.

Jenna McNamee:

So, proof of work requires a large number of powerful computers, essentially. We call them miners. And what these computers are doing is they're working continuously to solve a problem that essentially breaks through an encryption to reveal a unique number, like an identification number. And that identification number, essentially, becomes a ledger for a new Bitcoin transaction. So, these computers, these mines, are working, working, working, trying to break through this encryption to discover this number, and then when the one computer finds it, it's rewarded with a new Bitcoin that's added to the blockchain, thus validating the transaction.

But where the issue lies is that not all of these computers that are mining actually can solve the problem. So, say there's 10,000 computers mining and one solves the problem and identifies the number, all of the energy that those other computers were working, working, working, and now all of the energy they expended is essentially just a loss. So, that's Bitcoin and that's why it uses so much energy. Now, there are alternatives. So, this proof of state consensus mechanism, that one is much less energy intensive. It's a process by which crypto coin holders will lend their coins to the blockchain or to the crypto exchange as a form of collateral. So, this process is called staking, thus proof of stake, and the coin holders are called validators. So, then, once these validators put up enough collateral and all of the coins are staked, a transaction is validated, and then the validators receive a new coin. So, this is the type of process Ether uses. So, cryptocurrency Ether. It uses this process where validators are putting up their existing Ether coins as collateral to validate new transactions.

David Morris:

Jenna, to me, there's an analogy here. Any business person, and I think this is every movie you'll see about business, as well, the person will say, "Well, why would I put up my own money? I'm going to have somebody else give me the money to put up." That, I imagine, plays a role in why one of these consensus mechanisms might be more popular than the other because proof of stake, you essentially have to put up your own risk, and you don't if it's proof of work. Proof of work is all about the work and reward and the profit.

Jenna McNamee:

Right. Exactly. So, people who are staking their currencies, they expect to receive a profit as a validator. They expect to receive new coins as a validator.

David Morris:

I've really tried to figure out why wouldn't anybody just go with Stellar? And I think one of the issues there is that they have to put up risk. And if they don't actually win the prize, then they're out of their investment. Is that a fair assessment?

Jenna McNamee:

I think it's fair to say, and you have to take risks to get a reward.

Rob Rubin:

Do the mining farms take risks? Their risk is that they are mining and mining and don't get the answer.

Jenna McNamee:

Right, exactly. They're not actually putting up their own cryptocurrency to do the mining. They're just mining and their loss would be expending all of that energy and not winning anything.

David Morris:

Yeah, they're not going to lose an asset in addition to losing their time and the money required to expend the energy.

Rob Rubin:

I'm still unsure about why it consumes so much power.

David Morris:

I think part of that goes back to what Jenna was saying. I mean, you've got how many miners going after the ability to mine a Bitcoin. And with proof of work there's one winner, and there's a tremendous amount of inefficiency. Jenna, is that fair?

Jenna McNamee:

Right, exactly. I think these farms are millions of computers, and only one computer is going to be able to find that identification number. So, all of those other computers are just mining, mining, mining, but they're not getting anything from it, and then all of that energy is wasted.

Rob Rubin:

Yeah, but the way the company that owns the mining farm thinks about it is not that each machine is mostly wasting its time. It's how many coins can we get a day, right? They're trying to think about the volume. How much money do we make across all of our machines? The theory is we have a million machines, and we get this output. If we had 2 million machines, would we get more output?

Jenna McNamee:

I think they're all mining for the same number because you can only unlock the next number on the blockchain. So, it's not that a million computers might be able to identify 100 numbers. It's 1 million computers are looking for one number, and then once that one number is uncovered, then the million computers start looking for the next number. So, I just think they're constantly looking for that one number at a time, which is pretty inefficient from an energy perspective.

David Morris:

From an energy perspective versus the profit perspective, there's clearly more than sufficient profit to continue to drive this activity. But the issue is whether or not that's the most efficient way, from an energy consumption perspective, to do that. And I think it isn't, especially given the numbers that you provided here, Rob. But there's tremendous inefficiency from that perspective.

Rob Rubin:

Let's sum up the headlines before we jump to Story by Numbers. I covered this topic, and we talked about the New York Times article where these Bitcoin mine farms are consuming unbelievable amounts of energy, and we talked a lot about why the proof of work versus proof of stake consensus mechanisms and why they're there. So, in our Story by Numbers, we're going to really dig into this topic a little bit more by looking at some of the reasons why it may or may not ever change. In Story by Numbers, we pick a number or two that helps us dig deeper into this topic.

So, in a 2022 report titled Revisiting Bitcoin's Carbon Footprint, which was conducted by a consortium of climate and economic researchers in Europe, they estimated that Bitcoin mining may be responsible, and I don't know what these numbers mean, but 65.4 megatons of CO2 per year. That seems like a lot, and it's a lot when they put it in perspective that that's actually comparable to Greece, which is a developed country. So, my question is this consensus mechanism's proof of work costs a lot of energy. Is there any way that Bitcoin is going to change its consensus mechanism to something that's a little bit more friendly to the environment?

Jenna McNamee:

I think the answer to that would be no.

Rob Rubin:

I agree with you.

Jenna McNamee:

I would say these computers that are mining, these miners, these Bitcoin farms, like we talked about in the first segment, the profit is there. They don't mind spending all of this time, all of this energy looking for these unique numbers because the profit's there.

Rob Rubin:

Right.

Jenna McNamee:

They're going to make money from this. Whereas, with proof of stake, there is really no profit generation except for the validator, who is putting up their own coins. So, there's just really no gain for Bitcoin to switch because those miners would be out of a ton of money.

David Morris:

Yeah. And the thing with Ether is that they did switch to pos, but I think there's a competitive element there that could validate competitor to Bitcoin to make that change. If you are holding Bitcoin, and you actually really are concerned enough about the environment, that you may switch allegiance to Ether if they were to go about doing something that they can promote as more efficient, then there's a competitive angle there for Ether. I don't know that that's necessarily been successful, though, because it's not like Ether's exploded subsequent to having done that.

Rob Rubin:

I mean, Bitcoin, if you look at all the volatility in crypto over the last three years, the one cryptocurrency that wasn't that volatile is Bitcoin. It's maintained, and even, I think, its value is even higher today than it was in 2020, or close to it if it isn't. I haven't checked recently. But Bitcoin value stays up, so it doesn't seem like there's going to be any momentum to change something that's going to absolutely have a tremendous impact on our environment.

David Morris:

I would completely agree. The incentive, currently, just doesn't exist. I think what you, ultimately, would have to look toward is some regulatory policy shift that could incentivize

change.

Rob Rubin:

Well, we're going to talk about that in our third segment. So, I'm going to hold off. In our second number, I want to talk about blockchain overall because we're talking about crypto. But there was a really interesting, and we're going to put a link to it. PWC, they did a report, Global Blockchain Impact Report, and it estimated that blockchain's total global impact will be equivalent to 1.4% of GDP by 2030, and that growth is going to generate a tremendous amount of greenhouse gas at a time when the world is trying to reduce greenhouse gas. So, a lot of banks are focused on their ESG policies and really talking a lot of game about the environment. So, my question is how are banks currently investing in using blockchain or crypto?

David Morris:

Jenna and I, we were talking about this briefing and really looking at the profit motivation that we've been talking about. In my opinion, at least from my perspective, you see tons of activity in the banking space, but I think there's a competitive element there that can help explain that. These incumbents, I think, continuing to drive blockchain driven investment at a time when you're actually seeing a lot of implosion in the crypto space. Do you remember that?

Jenna McNamee:

Oh, yeah. I think incumbent banks, especially, it's a proprietary move, I think I would say. In the US, we talk about how regulators are kind of urging banks to isolate crypto exchanges, but these banks are, then, taking that as an opportunity to say, "Hey, I'm going to develop my own blockchain, and it's going to be ours. And we're not going to have to deal with an exchange." Or, "We're not going to have to deal with some third party provider giving us a blockchain. We're going to work to develop it so that it's ours."

David Morris:

Yeah, I thought that was fascinating because you've got Wells Fargo, JP Morgan, Citi, these are the largest banks in the country.

Rob Rubin:

And they're offering private blockchains?

David Morris:

Yeah. I mean, JP Morgan's all over private blockchain. It's doing that domestically. It's also doing that internationally. It's got its eye on B2B and beyond.

Rob Rubin:

What consensus mechanism are they using? Do you know?

David Morris:

Well, I think the real pivot here is that this is private blockchain.

Rob Rubin:

So, they don't need a consensus mechanism?

David Morris:

I think that when you're looking at public blockchain, you're looking at an entirely different approach to mining.

Rob Rubin:

All right. So, it will consume theoretically less electricity than public mining?

Jenna McNamee:

I would assume it would because these banks are not in it to mine coins. They're not trying to mine Bitcoin. They're not trying to mine Ether. They're just trying to use blockchain to make their own transactions more efficient. So, that will be a lot less energy intensive.

David Morris:

Yeah. They want to utilize the blockchain to increase their margins, not reduce it, and to utilize the inherent benefits that it can bring to banking and payments, real time settlement, yada, yada, yada. So, I would agree with Jenna.

Rob Rubin:

I mean, just as if you look at one use case example of closing a home loan, the number of human involvement in that transaction in terms of validating the parties, validating the

transaction is really ripe for a blockchain type closing. And I think they are even doing some mortgage closings using blockchain already.

David Morris:

Yeah, it's far more efficient and inherent trust is built in. So, yeah, they're all over this. As you know, Rob, I cover this more from the payments angle, and that's where Visa and JP Morgan, they're really substantially investing in blockchain technology at a time when you're seeing all of this implosion because they see the long game here. And I think that there's an end game that involves these private entities, ultimately, controlling the flow of money, not a public blockchain. That's ultimately one of the things clearly at stake.

Rob Rubin:

Well, I do agree, and that is all the time that we have for our second segment, Story by Numbers, where we really talked a lot about, first, why we think that Bitcoin will never change its consensus mechanism, and how does that differ from what banks are doing with blockchain. Now, in our final segment today, What If, what if we look at a hypothetical, and we discuss the potential impact as if it were reality. And for today's What If topic, we're going to discuss what would happen to crypto and blockchain under certain scenarios? So, my first scenario is really focused on Bitcoin. But what if governments required carbon tax credits if you were mining Bitcoin. They require that you buy carbon tax credits to pay for all of the greenhouse gases that you're pushing into the environment.

David Morris:

I like the idea. If you think about it, just from the standpoint of, in the United States, having some framework that's capitalist and competition driven. If you can weave environmentalism into that, like a carbon tax credit, that's a great way to get companies on board because it can be in the corporate interest. So, that's my angle.

Rob Rubin:

I'm going to argue with you for a second on it because I don't think that it's going to be an effective policy. And the reason is because, and I'll use this example, 76% of countries are signed up into the Paris Accord for climate control, and that means that 24% of countries aren't. So, if it becomes unprofitable, there's going to be another country's interest in letting you mine in my country. So, we live on one earth, but we can't control everyone.

Jenna McNamee:

I think that's a great point, Rob. I mean, I think if you're going to do any type of regulation around this, it has to be a global blanket of regulation.

Rob Rubin:

But how are you going to do that?

Jenna McNamee:

It honestly seems impossible. Yeah, it seems really impossible. And like you said, if certain countries are requiring these Bitcoin farms to buy a carbon tax credit, they'll take their business elsewhere. Or even worse, they'll just find some way to evade the tax.

Rob Rubin:

Evade the tax.

Jenna McNamee:

We know that happens. We know that already happens, so I don't think it would be any different in this space either.

David Morris:

I can't argue against that, conceptually. I mean, you can look at history dictates that being true. You can look at the American steel industry and any number of industries that you just offshore the environmental problems, actually, environmental label problems. That's why, in the '80s, the steel industry disappeared in the United States, and then you have factories in foreign countries belching out the worst smoke on the planet. But that's because they want the jobs, and they don't care about the environment, at the time anyway. I think there's also ways that the government can craft incentives and limit the ability of multinational corporations to do some of those things. I think, in certain ways, they've started to do that with tax and the whole issue with global corporate tax. But I agree, the whole geographical porousness is a real issue.

Rob Rubin:

I wonder if one of the ways that they can get around it is by working with the exchanges themselves that trade these currencies and trying to recoup it at that place as opposed to

going after the miners. Because the miners can locate themselves anywhere, but there's going to be a limited number of exchanges where all of this currency is traded.

Jenna McNamee:

Rob, I think that's a good point. And I think that that would probably be the most effective place to try that, but I still think that we would find bad actors evading somehow. Or there would be caught there with it, or a shadow banking system, essentially, would be created, or a black market would be created where people are evading this.

Rob Rubin:

Unless where the coin was mine's province becomes governments require that the Bitcoin mines province has to be in certain countries that are regulated and how they manage the energy. In other words, if you create a Bitcoin in a country that is spewing gases, the EU might say, "You know what? That Bitcoin's not good here."

David Morris:

That's interesting. Yeah. I mean, all I would say because the global ability to compromise and negotiate, you mentioned the Paris Accord, and that's a terrible struggle for some of the reasons that we're talking about. You have highly industrialized developed countries that see a very different way of being able to handle emissions than developing countries that were centuries behind in terms of economic development, like China and India, who see it very differently, and for good reason. They're coming at it from their perspectives.

Rob Rubin:

But China actually halted all Bitcoin mining because of its power consumption at one point. Now, it's slowly coming back into China, but they actually said no Bitcoin mining, and they did close it for a while. So, China, I don't think it was necessarily about pollution, though maybe it was. It was probably just about their energy grid and how much consuming versus their requirements for other things.

David Morris:

Well, and also, politically, they're backing the CBBC.

Rob Rubin:

Yeah.

David Morris:

They're out in front and with digital currencies, which is a long-term competitor to crypto. So, that could be another rationale is that they're putting their bets behind something else.

Rob Rubin:

Right. But it's very interesting, the geopolitical confrontations that could happen around Bitcoin mining. What if governments restricted the amount of energy crypto blockchain did consume? Would it change anything? Or that's all the same thing? A carbon tax credit is making you buy something to produce it as the same thing as restricting it, right?

Jenna McNamee:

Yeah. It's essentially the same thing. I couldn't imagine just power being shut off to a mining farm without something similar to what we talked about earlier with the farm having an agreement where, each hour that they're down, they get some type of compensation for that.

Rob Rubin:

I always believe in carrots versus sticks in terms of incentives to change behavior. And I wonder if, for the Bitcoin mines, which aren't going to go away, if a government decided that, "We will give you an incentive to use renewable energy."

David Morris:

There you go.

Rob Rubin:

Right? So, it's not, "We can't get rid of you. We know that. But if we can make it worth your while to use something that doesn't destroy the environment, will you?"

Jenna McNamee:

It's an interesting point, and I think about it pretty frequently. I just think that some of these alternative energy sources, not that they're not developed, but they're just maybe not as powerful and I think-

Rob Rubin:

As coal plants.

Jenna McNamee:

As coal plants, as fossil fuels.

Rob Rubin:

Yes.

Jenna McNamee:

Yes. Because timing is so invaluable in these mines, and I think any type of disruption of service would be a big hit to these farms. Maybe there's some inefficiencies in solar power, say. I guess we could talk about that one.

David Morris:

Yeah. Jenna, I agree with that. The thing is, though, and maybe this is, again, it's a policy decision where the United States is behind other countries in promoting some of these alternative energies. Some of these European countries, they're so far ahead, and they've been able to make it work. And I think even underneath, you look at certain states, like Nevada. I mean, a hydro electro power from the Hoover Dam probably supports half of Las Vegas. So, it can, I think, work, but maybe not to your point.

Rob Rubin:

I was going to make a joke that the Hoover Dam is great until the river dries up, because ... that's all the time we have. On that happy note, I chose this topic for this because I thought it was interesting, and it was a little different than some of the things we've chatted about, and it certainly was, and it was a lot of fun. And I'm sure that there are going to be listeners who think that we know very little about this. But that's okay because I think that it was a lot of fun learning about it for this episode, and I really appreciate how much time you guys also spent. So, thank you. That was a lot of fun.

Jenna McNamee:

Thank you, Rob.

David Morris:

I loved it, Rob. I mean, Jenna, it was great talking to you, and this isn't my belly wick looking at the environmental side of things. And so, it's a real eyeopener for me, and to be able to push these hypotheses forward, lots of fun.

Jenna McNamee:

Yeah. This isn't something we talk about every day, so we are talking through these different alternatives and really learning things as we're doing it.

Rob Rubin:

Yeah. I loved it. And I want to thank everyone for listening to it and for listening to the Banking and Payment Show, an eMarketer podcast. And I also want to thank our editor, Todd, who has his work cut out for this one. In today's episode, we did reference several articles and a report by PWC on environmental concerns about crypto and blockchain, and we've included links in the show notes. Our next episode's going to be on July 11th, and you'll not want to miss it. See you then. Bye, everyone.