Perspectives
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LORY KEHOE & SHEILA WARREN: The Intersection of ESG and Digital Assets

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Featuring:

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TOM HOARE: Hey everyone. Welcome back for another episode of our BNY Mellon Perspectives podcast series.

Today, we've got a really interesting conversation for you. We've brought together BNY Mellon's Director of Blockchain and Digital Assets, Lory Kehoe, with Sheila Warren. Sheila is the head of data, blockchain and digital assets team at the World Economic Forum. She's also a podcast host herself at *CoinDesk*, one of the most respected blockchain and crypto-focused media platforms. For this episode, Lory and Sheila have put their heads together to talk through one the most complex challenges within the rapidly moving digital asset space – and that's ESG.

As many of you may know, BNY Mellon made significant headlines earlier this year when we announced the industry's first Digital Assets unit. We see digital assets as becoming increasingly mainstream to the global financial ecosystem, thus our move into the space. But one of our other top firmwide priorities is embracing environmental, social and governance principles – ESG.

While some in the industry have scrutinized the growing prominence of digital assets in the context of ESG concerns – often around energy consumed by associated technologies – Sheila and Lory walk listeners through some of the issues, and also identify opportunities for the digital asset space to become a more ESG-friendly ecosystem. They talk through companies can embrace digital assets while continuing to deliver on important and enduring ESG commitments. I think you're really going to enjoy it -

I think you're going to enjoy it – there These are two of the leading experts in the field – one, of course, from BNY Mellon and the other from the World Economic Forum, two great vantage points for this very important topic.

Listen, rate, review – give us your feedback wherever you listen to your podcasts and as always, we appreciate you listening. See you at the next episode!

LORY KEHOE: So, Sheila, thank you so much for joining us here today. We're incredibly fortunate and excited to have someone with your expertise, your background here to weigh in on this important, but also this complex topic, looking at the world of digital assets, of blockchain, of DLT and ESG. So, I really think that the impetus and the reason behind this podcast is that we're currently facing an exciting time for business because of digital assets and all the opportunities they bring, but also how we can manage to fulfill our commitments when it comes to ESG.

So, the purpose of this podcast and what we're here to talk about today is to take a closer look at this and to understand these dynamics and how they work together, but also how best we can move forward. So, really before we get started and we get our teeth [sunk] into those areas, really, it'd be great to get at a little bit more context from you in relation to your background, also how you've become famous in the digital asset world, and that's true whether you like it or not, but also your work within the World Economic Forum, so over to you.

SHEILA WARREN: Yeah. Well thank you so much, Lory for having me on, and to the whole Bank of New York Mellon team, I'm really excited to be here and have this conversation. I think it's one of the most important things we can be talking about, and just to contextualize this in the immediate instance, we're certainly seeing a lot of language coming out of Washington, coming out from other political leaders and regulators around this topic of ESG. Whether it's thinking through the environmental implications of certain forms of cryptos, certain manifestations of cryptos, typically Bitcoin, or whether it's questioning is there utility, is there value here for everything from the underbanked or unbanked? How do we think about financial inclusion? Is that real? And you've seen Senator Warren herself indicate that this is a lot of what's happening and what's top of mind. And I think that's indicative of a lot of leaders who aren't necessarily talking about this publicly but are having these thoughts privately.

So, I run the digital assets and blockchain team at the World Economic Forum. I'm headquartered in San Francisco. I'm also the Deputy Head of our Center for the Fourth Industrial Revolution, which looks across emerging and frontier technologies and thinks about how their convergence is actually shaping the society that we live in. We do quite a bit of work around governance and policy, and thinking about how governance and policy, whether it's regulation or other policies in general or governance itself within a particular protocol or business, can actually help accelerate benefit and mitigate risks of technologies. And, of course, blockchains are critical. And what I think is really powerful about blockchains and why I spend so much of my attention on them, and I suppose why I've gotten a bit of reputation for talking about them quite a bit in digital assets as well, is really rooted in governance.

It's the idea that these decentralized systems – and we can have debate after debate over how decentralized is any individual system, it's a worthwhile conversation to have – but the whole notion of decentralization is extraordinarily powerful, not just from the disintermediation perspective of removing a central authority or removing a honeypot or any number of consequences of removal of a centralized intermediary, but also because of the power that it gives to different actors in the ecosystem. The Forum has talked quite a bit about the shift that we want to see and that we're starting to see from extractive shareholder capitalism, to more of what we call a stakeholder capitalism model, where we're really thinking more about equitable allocation of both risk and reward

across a broader spectrum of stakeholders. Everything from employees to users of a blockchain protocol.

So, we'd come at this, and I come at this, with the perspective that we ought to be focusing on improving lives. We ought to be focusing on raising standards of living around the world. We should not be anchoring ourselves in either a Western notion or a prototech vision of the world and how it operates. And I think that distributed ledgers and decentralized systems are one of the most powerful tools we have to realize changes and a different world.

LORY KEHOE: Thanks for that, Sheila. One of the really important things around this topic is that there are... I guess there's all these different terms out there and rather than go into them individually and explain them, it'd be great to maybe spend a minute or two, if you wouldn't mind, just talking a little bit about how blockchain technology, tokenization and cryptocurrencies work together. Just before we jump in to talk more in detail about, I guess, digital assets, crypto and ESG, just to level set for a moment, if you wouldn't mind.

SHEILA WARREN: Sure. So again, I won't do a "Blockchain 101," but I certainly hope that those who aren't familiar will take advantage of any of a billion resources out there that can educate on what a blockchain is and how it works at a lay person level. But the way a blockchain functions, I think I want to anchor this in governance to respond to your question. So, when you think about the stakeholders in a system…so right now you think about a retail model, you've got basically, "I'm a consumer, I buy a product, and then my engagement with that product is limited essentially to my handing over money of some kind or some assets in exchange for that product and then I go off and use the product."

When that product is financial services, there's a pretty standard way we understand how that happens, and we've all engaged in that, so I won't belabor it. When you bring a blockchain into the system, there's this notion that you actually retain stake. Now this isn't always the case, but let's go with it for the sake of argument. You retain stake, you retain some influence over how the underlying system itself is functioning. And that is often done through tokens.

Now, a token is, we can go into...there are a million definitions of tokens and, again, I encourage people to get into that philosophy, the debate that rages around what is or isn't a token. But, for our purposes, let's imagine a token as a manifestation of the investment that you have made in a particular system.

Now, in some systems, that token actually gives you what's analogous to voting rights, and those voting rights have the weight of the amount of token that you hold, etc. So, with that voting right, you can actually provide influence or input into how the system itself is operated and runs. Now that is a very scaled-back, bare-bones vision of token economics. But the idea is that you're more of a user of the system, participant in the system than you are a consumer of the system. And that notion I think is really, really important.

Now, the next thing that I'll say is when you engage in this kind of model of what's called tokenomics, very commonly, you can engage in fractionalized ownership of things. But this is not a new concept. Currently, you can own part of the building here and there and this is done through real estate investment vehicles and things like that all the time. Imagine that happening with any kind of asset. So, you can digitize an asset and you can own a fractional share of it. That representation is done via

the token that you hold. And then you, along with all of the other owners of that asset, can engage in a democratic-ish, depending on the governance system, process to determine what happens with that asset.

So, the digitization of assets, not only are assets moving digital, which again, visual representations of things, that's a historical thing, that's been pretty [well] known, but you can then separate essentially the ownership of the asset as a whole, you can fractionalize it and then you can create secondary markets around all of those assets and all those fractions that you own. So, it's taking all of that, but you retain stake. You retain this ability to influence that system. And that is what I think is fundamentally powerful about these systems in the context where I was talking about, which is the stakeholder capitalism and allocation of risk and reward concept that I think is so powerful and important. And that I don't think is getting enough attention both in the eyes of political leaders and regulators, but also even in popular press.

LORY KEHOE: Wow. Okay. Well, that is insightful and also, I think, a rather exhaustive answer to everybody who's listening. One of the other areas that we wanted to chat about is what's going on right now in the digital asset, crypto, blockchain, DLT landscape. What are your thoughts as to where we're at right now?

SHEILA WARREN: Well, I think the question is more, “What isn't going on?” So, I think one of the positive things of... I hesitate to say anything positive from out of the pandemic, but a lot of people were at home working really hard and so we saw this build phase within the digital asset ecosystem and the crypto ecosystem. As a result, I think we've catapulted ahead. We've almost avalanched in some ways forward in terms of what I actually thought we would see. If you asked me in 2019 where I thought we'd be in 2021, I would have had us behind where we are now. And I do think that's related to the fact that people had to focus. They had to put their anxiety and energy somewhere, they put it into building.

So, we've seen an explosion of different opportunities achieve more mainstream attention. So, let me give you an example of NFTs, non-fungible tokens. Non-fungible tokens date back to CryptoKitties, which were, I'm a CryptoKitty. And that came out, I think, in the 2018 timeframe. They're not new, per se. What's new is that there was a lot of infrastructure built around NFTs, there was a lot more awareness. These were picked up by a number of different communities that found them really powerful ways to monetize their creations. And so, you've seen the emergence of what we're now calling the creator economy. The metaverse. It's not a new concept, but it's really blown up and exploded in ways that I didn't think we'd get here this fast, frankly. I thought it'd be another, maybe, year.

I think most of us in this space saw this coming, but we thought we were maybe another year, 18 months, maybe even two years out from where we are today.

Similar explosion around DeFi. Last summer it was called the “Summer of DeFi.” DeFi stands for decentralized finance: DeFi. And that is basically the provision of financial services in a decentralized model. So financial services, everything from credit, insurance, whatever it is, all of these things are available. Leverage all of that in decentralized systems.

That has, again, massively exploded, and it's actually hit the attention of a lot of the regulatory bodies around the world in conjunction with crypto. So, what you're seeing is where before we were talking about crypto as this monolith, now we actually have some differentiation within the ecosystem and these different options if you want a product offering, what you want to call them, depending on your frame you'll call them different things. But I would call them opportunities and manifestations of a combination of decentralized governance and the underlying technology. So, we have come a tremendously long way and I would really say, "What isn't happening right now?" There's just so much engagement with this space and it seems like every week I'm hearing about some new exciting project that are in early days. A lot of these will not succeed, but something will stick, and as a result, we're getting more attention. Good and bad.

LORY KEHOE: You think NFTs are here to stay? They're a real thing?

SHEILA WARREN: I think all of this is here to stay. I think it's a matter of how mainstream does this go? But I think that we have to think about the cultural context of NFTs. You had a lot of creators who were really, really getting cut out of a monetary reward by either centralized platforms or by the system, or whatever it is, by historical inequities, whatever it might be. And I think that this is a response to that. I think that the growth that you're seeing around this is a response to that historical shutout, and the recognition that they were taking on a lot of the risk, and really not obtaining as much of the reward as I think anybody would have deemed fair.

So, I think some form of NFTs is definitely here to stay. Is it the current form? And that's not really for me to say. I think that's going to depend on those in the ecosystem, what gets adopted and what gets the pickup. But there's no doubt in my mind that the creator economy and that concept is something that we've been moving towards for a very long time. And with the new innovations we're seeing in Web 3, I absolutely think that that is something we all need to be not just preparing for, but excited about, I would think.

LORY KEHOE: Good. In relation to DeFi, and back to your point: Is really the future of DeFi based around governance?

SHEILA WARREN: I think so. This is a personal view. I think DeFi is going to succeed or fail based on the perceptions more than the reality, because of course, this is the world we live in, the perceptions around how decentralized it truly is, and how much value that stake is actually providing to individuals. So, this all comes down to how DAOs are governed. DAO, D-A-O stands for decentralized autonomous organizations. This is an area I'm obsessed with. I'm a former corporate lawyer, so corporate governance has been really interesting to me. DAOs are not corporations. They are a new form of organizing stakeholders into a collective body. And there are some DAO experiments that have resulted in *Lord of the Flies*-type anarchy, and there are some that are highly structured, and they mimic traditional corporate systems.

And it's going to be really interesting to see the experiments happening there and what survives and what doesn't. And I think we're in the renaissance of DAOs, if you will. A phase of tremendous exploration and what happens with DAOs I, personally, think is going to determine what happens with DeFi, crypto, all of these systems. The confidence that people have, that a DAO is ultimately going to reflect their point of view in a fair and equitable manner. Not that their point of view is always going to be the one that prevails, that's not how democracy works even now, but that there will be some

fairness and equity built into that model – I think is going to determine how much people are willing to engage in these models, and that's going to determine how that ecosystem flourishes and thrives.

LORY KEHOE: Okay, thank you. No, no, look, and you know what –

SHEILA WARREN**:** I have some opinions. I have some points of view here.

LORY KEHOE**:** 100 percent, that is why you're here and we're keen to learn. I think one of the things that comes up here as well, it is an interesting area. So, if you look at millennials and Gen Z, they really feel that, I guess, digital assets, blockchain, crypto is the internet of their generation. They're passionate about it, and they have points of view and they're happy to share, and there's no shortage, I guess, of opinions when it comes to this topic. And more power to them. But, also one of the things about that group is that they're extremely environmentally conscious and climate conscious and certainly have an awareness, an increasing awareness, around ESG. And this comes back to that point: How do we deal with that two-sided conversation around digital assets and ESG, and what do you think really millennials are thinking about when it comes to that? How do they ethically invest in digital assets?

SHEILA WARREN: So, I think you've got to move beyond millennials. So, this piece of art is by my daughter, who is eight. And I think this generation, her generation, is going to be what I call crypto native. So, millennials and zoomers are digital natives, they grew up with the device attached to their whatever it is. This next generation is even beyond that. And they are going to be much more Web 3 oriented. And I could actually imagine 10 years from now, my daughter sees a video and she's like, how could you put my artwork in the frame without some sort of... whatever model around that. You know whatever it is. I can absolutely see my kids telling me, how could you ever put your information online? Why would you ever? What were you thinking? Were you crazy? How could you do that?

So, we're moving into a very different model of a generation that is still being formed today, and the pandemic is going to be critically important to their awareness. So, I think you have to look well beyond millennials and zoomers who are driving, I think, a bit this NFT moment if you want to call it that, into the next generation. Because that's, I think, who we have to be having in mind who we're building for. And so, when you think about the awareness that elementary school-aged children or tweens have about the environment, it is dramatically different from what I think you or I, or my parents' generation, their awareness of the environment. It's just dramatically, dramatically different. So, my daughters are the ones who drive our composting activities... whatever it is…those activities in our household.

It comes through the educational process. It comes through their just observations of the world around them. They've all lived through, I'm in San Francisco, the wildfires, the changes, climate, you've seen it all. They understand implicitly and viscerally. Physically, they understand and have a physical, almost cellular-level, awareness of what's happening to the world. So, it is not surprising, nor should it be, that there is more and more momentum towards this kind of activity and towards environmental responsibility, towards sustainability, towards social inclusion. They've also lived through periods of massive unrest all over the world, not just pandemic related, [but also] social justice related.

So yeah, I think we are going to fundamentally rethink what ESG means. It's going to be about more than purchasing carbon offsets. It's going to move well beyond that to say, "No, we want to make sure

that isn't happening in the first place." So, I think that ESG can benefit tremendously from the crypto [ecosystem]... I actually think the crypto ecosystem can be a driver of a dramatic change in how we can see the ESG because of the governance that we were speaking about. In decentralized models and systems, the accountability works very differently than how it works in centralized systems. Now, in some ways it's a lot harder to create accountability because there's nobody in charge, right? There's no central person to find or point a finger at or penalize or whatever.

On the other hand, there's a collective responsibility. And as this new ethos and awareness of sustainability and social inclusion becomes more and more dominant socio-culturally, politically, and otherwise, which we're already starting to see as you get younger and younger people into government, you're seeing what their predilections and their preferences and priorities are, you're already seeing this.

So, as that continues to happen, there's going to be a lot of skepticism about traditional ESG, which I think is fair. That was designed for a slightly different time. The new methods that have come out were designed for the current time, but they weren't designed necessarily thinking deeply towards a new society and a new emphasis. So, crypto is going to pave the way on that. It's something I firmly believe. It's why, at the Forum, we're launching our Crypto Impact of Sustainability Accelerator, which we call CISA, which is focused on not just development around new metrics, but saying we can't just isolate environmental questions and not look at the social and governance implications of them. And, in fact, governance should be driving how we think about the environmental and social consequences or metrics that we are developing.

So, we had to move beyond decarbonization. The blockchain can provide new methods of tracking that, very interesting. We have to think about how are we creating new models? How are we using nonarable land is something I talk about a lot. Nonarable land, if we can create demand for renewables, that actually is really critically important to the shift we can make as a society towards use of renewables. So, all of these things, you know, the blockchain ecosystem can support and provide, tokens can help with this. And I think it behooves us as a crypto community to come together and think really hard, move beyond our factions, move beyond our own individual desires to make the case that our protocol was the best one, whatever, move beyond that and say how can we as a community recognize that we have a broader call to action. And that's something we all need to be paying a lot of attention to, and being honest, being intellectually honest about what is real and what is not real.

LORY KEHOE: Just taking a step back for a second, which is, really in your opinion, what are the top three pressing ESG concerns around blockchain, crypto and digital assets? So, kind of a quickfire question.

SHEILA WARREN: Are you asking me personally, are you asking what is perceived as being the biggest risks... because those are, I think, slightly different answers. Maybe I'll answer the first one first, just to level set for both.

LORY KEHOE: I'd love to hear both, yeah.

SHEILA WARREN: Yeah. You just have to read the news. If you Google “crypto” or “Bitcoin,” what do you see? What do you see? The energy use of Bitcoin. That's a huge topic of consideration. You see

the ransomware [is supporting] Bitcoin specifically, but that's extended to all crypto. Is it actually paving the way for criminals to engage in antisocial behavior? That's another really critical one. And I would say third is, is crypto doing enough or can it help with the problems of financial inclusion? So those, I think, are the three talking points we're seeing a lot of policy makers make and that's being reflected in the price [symbiotically]. As the press reports more on this, the political leaders pick it up and it goes back and forth. So those are the three things.

Now, it's not that I don't think those things are important. I just think that they're adjacent to what I think are the critical questions. So, what I think are the most important things to consider are going to be unsurprising based on this discussion we've had so far. Governance, what does decentralization offer as an alternative to the systems we currently have? How do we create meaningful accountability within decentralized systems? Which I think is an extraordinarily hard problem, that I stay up at night thinking about among other things that keep me up at night. But it's a really hard problem.

And thirdly, I would say how do we tie environmental and social measures together? And how do we create more consonance and coherence in how we are articulating that environmental justice is social justice. And all of these things flow together. They aren't distinct the way that a lot of people like to paint them as being. They are very, very intricately related. There's no question that the penalties of environmental irresponsibility fall predominantly on poor communities, communities of color and certain parts of the globe far more than others. You just think about, like the example I always use to this when I get pushback on this point is, where does you think your trash goes? What do you imagine that your trash goes? You think your trash is being buried in your wealthy community suburb's backyard? No, it's not.

Where do you think it goes? It's going in the ocean or it's going to be buried in a poor community. Or in some cases, it's being shipped over a border to a poorer country and being landed there. That's what's happening to your trash and imagine what's happening with everything else. So, these are real paths that have been structured by society. Sometimes inadvertently, sometimes with [absolute] disregard for the lives of other human beings or others on the planet, sometimes maliciously, almost deliberately as a penalty for whatever it might be. And these are patterns that we have to be very cognizant of and aware of that really don't get talked about. So, I see part of my role here at the Forum with the platform, and so I've been privileged enough to have access to, to spotlight these things and to say, "If we're not thinking about holistic solutions, what are we doing any of this for?"

LORY KEHOE**:** One question. So, do you think that, I guess, the energy consumption factors that we've just spoken, do you think they're having a real impact in terms of investor appetite and interest in crypto and digital assets?

SHEILA WARREN**:** I guess I'm more of a cynic about it. I don't know that they are. And let me just say a couple of things on that point. So yeah, there's no question, let's just talk about Bitcoin mining because you're probably going to ask me at some point, and so we should just to get to it. So yes, Bitcoin mining uses a lot of energy. Great. That is a fact. And anyone who says it's not a fact just has an agenda that's not about intellectual honesty. Let's put it that way. It does. Now, I find a lot of the comparisons, I've used this "Apples to Zucchinis" phrase. It's gotten some pickup. I just find them really unhelpful and unproductive. Like, OK, so Bitcoin mining uses the same energy consumption as the entire economy of "X" country.

I'm the lawyer. You give me two things, I can compare them. It's a skill. It doesn't mean that's a useful

comparison that gets us anywhere. So, in my mind it's less about, “Is Bitcoin mining consuming the same amount of energy as the economy of Venezuela, or is it Argentina, or is it the Ukraine?” It's more like, we're at time zero on Bitcoin mining, at time one we need to be showing measurable significant improvement. And we can define that as a community, or we can have it defined for us, and I'm speaking now as a Bitcoin community. But really, as a crypto community, because what happens to Bitcoin has implications for all of crypto, whether people like it or not. That's just a fact. There's not a lot of understanding by a lot of people who have decision making authority around the differences we're trying to educate, but sometimes it just gets all swept together.

So, how are we showing demonstrable market improvements over time in the use of renewables? So, it's not so much offsetting what's happening again; it's converting into the better way of being. That's what we want to focus on. And to do that we have to have honesty about what's happening now, where do we want to get, how do we get there? What's the path? What is the reasonable timeframe to get there? And by reasonable, I mean ambitious. It should be heavily a point of focus, which it is for a lot of miners, to be fair to them. Then let's hold accountability for that. But I think that is a much more useful conversation than, "Oh, blah blah." And the reason for that – let me just finish this thought – is that the comparison of Bitcoin mining to “X” industry, even if it's the traditional legacy financial system or gold or whatever, is predicated on the idea that Bitcoin is going to go away. It's not going to go away. That's not a thing. That's not happening. Toothpaste is out of the tube; we're not putting it back in. Bitcoin is here. So, let's make it better as opposed to what, suddenly it's just nothing, it just vanishes. That's just not realistic.

So, this is my frustration, personally with the current rhetoric and conversation, which I do think is starting to shift. I do think we're seeing a little bit more focus on – OK, maybe it's unwilling reluctant acceptance of the fact that Bitcoin is here, it's part of our ecosystem. So, let's try to make it as sustainable as we can and understand what that's going to take and provide the support needed perhaps to do that or incentives for others to do that.

And that's where, I think, ESG metrics can play a role, because if you can measure something, then you can make more meaningful comparisons about it. And then I think we will see investors adjust and adopt when they understand what is really happening in this space and where is it going and when is it going to get there. I think we will see some shift in the way that investors are reacting to the space.

LORY KEHOE: OK. Great points. Well, one thing I wanted to drill into a little bit more is there is a lot of talk of renewable energy as being the source for Bitcoin mining and node validation and activities of that nature. Really, how can we prove that the energy is renewable? And I guess this feeds back into decentralized governance and things like this, but if I am a cynic and I want to pick and probe, how do I prove that?

SHEILA WARREN: So, this is the perennial question, and there are definitely people who are in this every day who were thinking about this Bitcoin, that Bitcoin, whatever it is. Once a Bitcoin is mined, no, present time, there's no clean Bitcoin or dirty Bitcoin, doesn't work that way. However, what you can do is look at the source of energy for basic mining operations. What is the source of that energy? So again, that becomes a time one or... you have to create a new time zero, you have to look at what happened in the past and be like, "That is where it was." Now we're at this point in time, what do we need to be seeing in terms of the sources that are going into those mining operations?

And that is something that you can pay attention to and look at. The same way that you can look and see is this is the source coming from... now, I am not an expert on how energy grids work. So, what I've understood about this is that when you're dealing with a general grid, this is impossible. You don't know the source there; it all gets mixed up. You can't tell that this came from over here, over there. However, when you're talking about building new farms and new things, you actually could imagine a Bitcoin-mining operation – this is theoretical – that is fueled entirely by a wind farm that was built for that purpose. That is a huge infrastructure investment. I want to be very clear, but that is not easy to do, but there you could actually have something like that where then the mining operation, the extra gets kicked off to that local community and you do new things with it.

So, when you're talking about brand new sources of renewables which have not yet existed, there is an opportunity from what I'm told to create measurement there and to prove that. But if you're using existing energy, it's just not possible to do and something we have to be, again, honest about. That isn't necessarily fatal. That's where I think this whole thing falls apart, because that's not fatal, because that's true of everything that we do. I don't know what's going into my computer right now. I actually literally having no idea what's going into that. It's not my area of expertise. I have to rely on external bodies to tell me that, and I have to trust that they're telling me the truth.

Now, a blockchain can help provide more evidence for that case, and show that it's actually more true or not. It actually can help with some of that. But I think it's really about how much investment are we making in renewables as a global society, but also at a national or even at a providence or municipalities around the municipal level, how much are we investing in this? And are there opportunities because of the consumption that is deployed by some of these operations? Is there a way to enable that to be something that encourages that manifestation in parts of the world where there hasn't necessarily been incentive to do so?

Now this is all, I'm going to be very honest – it's adjacent to and slightly out of my area of expertise, but it is something that I think we have to be, again, intellectually honest about. There's not a lot of that happening right now, that I know for sure. And also, we have to explore creatively what are mechanisms that we can use that can show and prove what is actually going on? What are the limitations on those? And then is that going to translate into this time zero rather to time one trajectory that is trending towards the positive change that we want to see. And, that in my mind, is what we have to be focusing our attention on as opposed to what's happened historically and other things, which are unfortunate, and were behind us.

LORY KEHOE: Yeah, I think you've raised a number of really good points there. That fact, although simple, is very true. We can say that the energy consumption for Bitcoin mining or other forms of mining and looking at validation for renewable sources, when we actually don't look for validation for what we have in front of us right now. So that is an interesting outlook, and it does pose a very good question. And I think the other piece that I want to touch on briefly was in relation to, I guess there's a lot of talk about the consensus mechanism for Bitcoin being proof of work, and then these other consensus mechanisms such as proof of stake, proof of authority, etc. being far more energy efficient. What are your thoughts on that? Is that true? Is that the future? Is that the solution to this problem?

SHEILA WARREN: So, I think there are a number of different solutions to this problem. I think that it is measurable that certain consensus mechanisms are less energy intensive than others. That is,

again, that's just all have to take that as our predicate, that is true. We wouldn't be so eager to move from proof of work to proof of stake in the Ethereum community if that were not the case. So, there are just instances of this that we know to be the case.

Now, that being said, I do think that there are other… when you think of L2 which are just Layer-2 solutions or applications that are on top of Layer-1 protocols. Layer-1 is the decentralized protocol and then Layer-2 is an application on top of that…then maybe more or less centralized depending on what it is, so I'll just leave that there.

When you think about Layer-2, I think there are opportunities to think about, "What are we actually doing with what exists?" So, are there ways that we can actually take things off-chain and then minimize the need to be on-chain? Being on-chain is, saying this really crudely, is what uses the energy, and off-chain activities don't use the same energy. So are there ways to pull more things off-chain and then have these moments that are on-chain and think about block size, things like this. I don't want to get too technical for your listeners, but there are things that can be done, and there are experiments that are underway at the moment to say, if we take as a predicate that proof of work is the most secure way of engaging in it, which is the argument for proof of work, is that it is highly secure.

So, if we take that as true, which I believe it is true, then are there things we can do to mitigate the energy intensity of that by shoving more into each instance where we have to deploy that energy or taking certain things, recognizing not everything has to be necessarily on-chain and things can be off, things like this. And that is a really interesting conversation that's happening in the community around us. But I think the major takeaway for me is the idea that this was news to the crypto community like, "Hey, [look at the] energy [going] into crypto..." Everyone is on this for a very, very, very, very long time. There have been a lot of people who have been very concerned about this and sounding this alarm, then the community for a very long time, certainly longer than I've been doing.

And I wouldn't say I'm an alarm sounder. I'm more of a "What do we do about it" person. This is not new. So, what I find interesting is we've seen these attacks on crypto over time, we saw the "Only nerds and criminals [will use it]," and then we saw [the] "No one will ever be able to use it, it makes no sense." Like, "Oh, well, now we're back to look at how horrible it is, for people using it to hold us hostage as a society," which, actually, the reality there is the worst thing you can do if you're a ransomware person is Bitcoin. That's the dumbest thing you could do. You want cash, you don't want Bitcoin.

So, all these things I think are interesting. And again, they're not without some truth. You can't just dismiss all these concerns and say, "Oh no, no criminals use Bitcoin." Of course, that's how things began in the early days, but these are just facts. That's okay. You don't throw the baby out with the bathwater. What you say is, "How do we do better?" And I think a lot of this is a reaction from systems that are recognizing that they don't have a better alternative. They're willing to acknowledge, I think legacy systems, that there have been historical inequities, there have been a lot of problems with these systems, they don't work for everybody, but there isn't really a better alternative. So, crypto has emerged as an alternative. And I do think that that's alarming, and I can see why that is alarming.

But I also think that it remains, at least in my view, one of the better options I've seen to help address some of these systemic problems and systemic inequities, and that's why I remain committed to seeing it get to the best place it can be. And then I think we have to evaluate when we've made some

of these changes, now as a society, what do we think? But we have to give everybody a chance to get there, to see that these are problems that take time to solve. They're not easy. If they were easy, they would have already been solved. It's not obvious that the trade-off between security and energy intensivity, it's not obvious where to fall on that. I think it's obvious for some kinds of transactions more than others, but we just have to have a more nuanced conversation. And as a society, I don't know that we have nuanced conversations anymore, especially in this kind of a sphere. So here we are.

LORY KEHOE: Yes. 100 percent. Not everything is black and white. The older I get, the more I realize that for sure.

SHEILA WARREN: Indeed.

LORY KEHOE: Another question, a final question. What are some of the innovative, I guess, ideas, solutions, companies out there that perhaps you've seen that you could share an overview of?

SHEILA WARREN: Yeah, well, I hesitate to ever name names because I don't want to be seen as anointing anyone. And I think we've touched on a lot of the areas I think are really exciting. One thing we haven't touched on, I think, is social tokens. I think these are really interesting. And so, if you look at things like Friends With Benefits or other kinds of opportunities here, you're seeing a development that stems from the creator economy around how do we create a social value around some of these tokens and tokenomics we talked about, and how do we create a crypto economics that is a new blooming field of crypto economics. So, this is token economics blown up to crypto economics. How do these systems provide new economic models that again can... my focus, of course, is equitable allocation of risk and reward, but there are a lot of other things you can do with these models that are really fascinating. And we're seeing a lot of academic investigation of this, which I think is really exciting, both from economists and others.

Anyhow, leaving that point aside, I think that the notion that the token economy can allow a manifestation of value beyond just creation and creator economy, but actually thinking through everything from influencer to how you represent yourself online. So, another thing along with crypto activity is digital twinning. So, you're really seeing more and more, especially during the pandemic, we were all online. Who you are online and who you are in real life are very symbiotic. So digital personhood is actual personhood.

It's not the case anymore that you're a person here and then your avatar is totally separate from who you are. Your identity psychologically is actually formed in part by experiences you have online. And there are a lot of studies about this in tweens and early adolescents and teenagers, particularly during the pandemic about how, because they were relegated to an online experience, that could be constructed that actually affected both positively and negatively their self-esteem. You've seen online bullying lead to horrible instances and all kinds of horrible things happening. That's real. Online bullying is real bullying. Online praise is real praise and you respond to it similarly. So social tokens scare me frankly a little bit, but I also think that they're a very logical next step to the realities of how we engage digitally and how digital personhood is becoming more and more the manifestation of who we are in our lives. So that's something else I'm tracking, again, with some trepidation but also a lot of excitement.

LORY KEHOE: OK, well look, a massive and big BNY Mellon thank you, Sheila Warren, from the World Economic Forum, for your time today to discuss the world of digital assets and ESG and the future of both. So, a big thank you from all of us for your time.

SHEILA WARREN: Thank you, Lory, for having me on. It was really a pleasure.

TOM HOARE: Hey everyone, Tom here again. Thanks again for joining. I hope you enjoyed that conversation. As I said at the top, keep listening on Apple Podcasts, on Spotify or wherever you consume your podcasts. Most importantly, if you're willing, leave a review or a rating and tell us your feedback. You can find us on social media – LinkedIn, Twitter, Facebook, Instagram – and BNYMellon.com. Thanks for listening. We'll see you at the next episode.