Decode 6

DECODING CARBON AND ECOSYSTEM SERVICES

CAN BLOCKCHAIN MAKE CARBON MARKETS MORE TRANSPARENT?

Featuring Alex Taylor

Core Contributor, KlimaDAO

DJ May 00:02
Welcome to the Decode 6 Podcast where
we take your questions about carbon and ecosystem services and match them to the experts with the answers. I'm your host, DJ May. And today we're asking you a very fun question. How can blockchain technology make carbon markets more transparent? Our expert with the answers is Alex Taylor. Alex is a co-founder in the digital carbon market space, pioneering the development of open-source technology for carbon markets. He currently serves as strategic advisor for Carbonmark, a core contributor at KlimaDOA, and co-founder of Offsetra. In short, Alex has spent a ton of time in this space and has an invaluable perspective on how blockchain technology could help solve some of the problems facing carbon and environmental markets. Alex, welcome to the show. It's great to have you.

Alex Taylor 00:52
Hey, great to be here. Thanks for having me.

DJ May 00:54
Yeah, well, we're gonna jump right in. So, our big question is, how can blockchain technology make carbon markets more transparent. But before we even touch that, can we get like the quick and dirty version of like what blockchain is and how it works?

Alex Taylor 01:09
Sure. So at its core, blockchain technology as a type of distributed ledger technology. So, you can think of it as a chain of blocks where each block records a batch of transactions, and each transaction contains a record for the ledger to show. So once transactions are verified by third party, they're bundled into a block, and the block is added to the chain. And that is the blockchain. And the crucial part is that it's almost impossible to alter the blocks on the blockchain. So this provides an immutable, trustworthy history of all transactions within the blockchain. I think it's, it's probably worth differentiating between two types of blockchains as well. So, there's public blockchains, and private blockchains. And in my view, they're quite different, or at least the benefits are different. My work personally is primarily focused on public blockchains. And I'm really what it comes down to is who can participate in a network by using it or building on it or participating in the validation activities. So a public blockchain network is entirely open, anyone can join and participate, they can view what's happening, maybe they'll create something totally new using the blockchain tech. Maybe they'll build on top of someone else's technology or, or even copy someone else's technology, which is referred to as "forking." Or maybe they'll just participate in a given network or use case if they find it interesting. On the other hand, a private blockchain network requires an invitation and must be validated by the network developer or or activity may be constrained by a set of rules that are placed upon a network participant. So businesses that set up private blockchains will generally set up a permission network, so restricting who can access so in essence, what both types of the core blockchain blockchain technology are used, and they ensure integrity and immutability of data. But the main difference is the level of access and control over the network. So when you're hearing about concepts of

interoperability or trust lessness, or even the word cryptocurrency, you should be thinking about public blockchains. And this is where these interconnected liquid systems, whether it's in the carbon market, or the digital artwork, or workspace, or whatever, that you often hear about on the news or emerging.

DJ May 03:46
Okay, so just to make sure I have this, it's kind of like the difference between like, say, if my like old-school record keeping system was like, I'm just gonna have some Excel sheet and then I could go in anytime and change that nobody would know what happened. Right? Like it would be totally, totally opaque from the outside the difference with Blockchain is like, everyone can see what's going on. They can see who did what, and you can't change it once. It's like, published essentially.

Alex Taylor 04:16
Exactly. And each entry will be validated by a third party, which is a "miner stake," if you if you've heard those words before. And yeah, it's difficult almost impossible to retroactively change those those transactions that are written on once they've been validated or verified.

DJ May 04:36
Great. So tell me when we talk about carbon markets, I know something that comes up is this like idea of double dipping or double counting and offset? How can blockchain help with something like that?

Alex Taylor 04:47
Yeah, it's it's a great question. And I think a lot of this comes down to this notion of trustlessness. It's, it's a popular concept within the blockchain space essentially means the participants in a given network did not have to trust each other. But instead, they trust the system itself. That may sound counterintuitive, but actually, it's a really major innovation of blockchain. So in traditional systems, you rely on a third party to verify a transaction. Could be a bank could be government could be a consultant, whatever. But with the blockchain, the system itself actually provides the verification and validation for, for participants. And so that means that those who use the systems can can actually be certain that each transaction has integrity, and that the characteristics of the transaction such as what it represents, or how much is paid to, to execute it, are transparent and readable for third parties to kind of, you know, validate for themselves and, and understand what's going on. And so yeah, within cloud markers, this is obviously very important, because accountability, and verification establishes trust. And within the carbon markets, there's been issues historically, around double counting or double spending. And you know, at the most basic level, if double counting or double spending is happening, this can reduce trust within the market, it can put the market's integrity into question. And of course, if consumers within that marketplace, don't have trust that that the market is doing what it says it should or what they believe it should, then they may essentially go elsewhere. For example, if they have an ESG budget, rather than looking into the carbon markets to just spend and invest in the climate, they may well spend that on another activity, so it will be a detriment to the market.

DJ May 06:57

Okay, I have two follow-up questions. First, as you were talking about setting up this like system that uses trustlessness, you're trusting the system, not other users? How much of that depends on like, how the system was set up in the first place? Like is it only as good as like the kind of information that you're asking people to put into it?

Alex Taylor 07:18
Yeah, it's it's a good question. I guess there's two levels within the system that we're developing on the polygon public blockchain, which we're building on. So there's, there's the kind of asset layer, and then there's the application layer. The asset layer consists of carbon credits themselves, or digital carbon credits. And of course, the interest that consumers might have within our system are going to be dependent on the type of carbon credits that are put into the system. So that's, that's one area out. And then there's the kind of application layer which is perhaps built on top of the asset layer, or maybe it's the other way around, maybe the application layer is built, and the asset layer can interact with the application layer. The application layer essentially consists of a set of smart contracts. So smart contracts allow people to interact with one another, they're pre-programmed, so they can only be executed when certain conditions are met. It could be a condition around price prices is a typical kind of characteristic of a smart contract. So you could swap, for example, Bitcoin for $28,000 at the moment, through smart contracts, providing, you know, you're willing to pay that out. And so these, these can be programmed in very specific ways. And, within our case, we have used an application known as a an automated market maker. And essentially, what this is does is it allows anybody to come in and pool liquidity within our application. And that means that rather than carbon markets, I've got a bit of a problem historically, with liquidity being fragmented around different venues. The idea is that if you have a public liquidity pool, lots of people can contribute to that. And then likewise, lots of people can benefit from that. But of course, that application itself has been programmed in a very specific way that it will respond to supply and demand. And so yeah, there's these two kinds of interacting systems, there's the asset layer that can be plugged into our application layer. And of course, if the asset layer is desirable, there might be more demand through that application, and it will respond in a certain way. So it's, you're correct to point out that, you know, think things can be programmed, and they have to be programmed well to be to actually be valuable for the market. But we think we've got some way to kind of demonstrate how it can be applied for carbon markets.

DJ May 09:55
Yeah, no, I think that's great. So just to make sure I have my head around this. It's kind have like, if you have, you know, your offset would be the asset, right? Like that's sort of what you're listing and then how you interact with it is kind of the application layer. Is that like the very simplified version of that? I'm sure there's much more nuance.

Alex Taylor 10:14
Yeah, exactly, except for what I would say is the carbon credits itself is, is the asset layer, the offset is, you know, the actual, when you claim the environmental benefit of the underlying credit, so, when, what, but when you say, when you say offset, you know, that's another application that we've built, we've built something that allows you through the blockchain to offset your carbon credit. So essentially, it removes the carbon credit from circulation and allows the individual or organization who, who executes through, we call it our retirement aggregator smart contracts,

whoever executes through that contract is the beneficiary of that credit. And therefore, if the offset,

DJ May 10:59
Okay, okay. Yeah, and I mean, to me, it seems like that's a huge innovation, because so much of what I hear, you know, people who are trying to develop carbon credits worrying about is like, we don't know what happens with them, or we don't know the protocol to create the credits that are being listed. And so this seems like you're getting a nice peek, kind of under the hood at what's going on without just like, you know, offset using this credit, like, we don't know how it happened, or what's going on with verification. It seems like a great way to keep track.

Alex Taylor 11:32
Yeah, so we spoke a bit about the client, the trustlessness, and why that lends itself to is transparency, right? Because you can view this entire system end-to-end. And so you can trust that that's what that what is what you see is happening within that system is actually happening. And with that, there's various characteristics of transparency that, that you can kind of accrue as a user. So for example, you can see trends of it might be price signals, I was talking a minute ago about that application we created with automated market maker technology, there's, there's a couple of transparent signals you can get from their price and also supply. So you can see if lots of suppliers being deposited into a given automated market maker, or you can just specifically say, "Okay, people are trading this type of carbon credit at this type of price." And, and that in and of itself is quite useful information. If there's a project developer, who knows that they are going to create or issue a card on credit, that has similar characteristics to say, a soil carbon project that is trading for $30. Within on an automated market maker, perhaps if someone comes and tries to offer them a low price for those carbon credits, they're like, well, actually, transparently, I can see in this system is trading for a certain value, and they may push back more strongly because they've got that transparent access to information. Likewise, with a consumer, perhaps they're offered a sort of a carbon credit for $60. And they say, but the project is, you know, able to sell their credit center market $30, maybe they only want to pay a 20% premium on that rather than 100% premium on it. So yeah, I think it's, it creates a really interesting dynamic within the markets when when you kind of have this level of transparency.

DJ May 13:37
Yeah, yeah. No, thank you for breaking that down. And then my last question here. Obviously, there's been a lot going on in like the crypto space over the last year. But how is blockchain different from crypto or cryptocurrency? Is it wrapped up? Do you have to use crypto to participate in something like this?

Alex Taylor 13:56
Good question. And I think sometimes it's a bit misleading or confusing for people who are interested in this space, but they don't really get the jargon. Blockchain is essentially the underlying technology. It's the structure that's used within the systems to create things. So we spoke earlier around applications and everyone's probably familiar with Ethereum and Bitcoin. So you can program the block the blockchain to create the applications and then you can interact with the applications with Bitcoin or Ethereum. So applications might be like Instagram, or Facebook or whatever. And, and, you know, to interact with them, and in the blockchain space,

you you'll have to do a transaction, the transaction will have a cost. And so you've got this kind of infrastructure layer. At the bottom, which is the blockchain, you've got the application layer, which is a set of smart contracts that must be fulfilled to use them and then you've got the code cryptocurrency layer at the top, which is how you interact with the application. So you've got this kind of stack of technology. So cryptocurrency itself essentially is it's a digital currency, it's a digital asset. It's how you interact with the system and how you fulfill the conditions of the smart contracts themselves. Blockchain's a system. Cryptocurrency is a token. Blockchain scope is much broader than cryptocurrency blockchain can be used to develop different things.

DJ May 15:31
Okay, I'm coming out of left field with this tell me if this analogy works, because it just kind of popped into my head. So it's kind of like the blockchain would be like your, your hardware. The smart contracts are sort of like the software they're like governing how you interact with the hardware and then to play you'd need like a login or a token and that would be like your crypto. Is that is that like, you know, just a very basic analogy. Does that work to describe it?

Alex Taylor 15:56
Yeah, I think so. Maybe the blockchain itself and they can be programmed. There's there's also a hardware layer with Blockchain networks, I wouldn't want to conflate the blockchain itself with hardware. So you can you know, earlier we spoke about the validation of blocks within a blockchain, you physically require hardware to validate that the blockchain perhaps borrows from the hardware. It's also programmable for a programming language to create software. And then I would say the application layer is more like the software layer.

DJ May 16:30
Okay. Okay. Now, that's really helpful. And then my last question, Alex, for you, before we we close out here? How do you see this changing or developing like what excites you the most about what could be coming down the pike for blockchain and climate and carbon markets.

Alex Taylor 16:49
So I think some of the benefits that blockchain can bring to the market will be hard to replicate elsewhere. This fear of collectively pooling liquidity for the market, I think, is very interesting and could be impactful in a market that struggled with liquidity. I think the transparency and and trustlessness of blockchain is also going to be hard to replicate, or it could be replicable, but it would cost a lot of money to replicate it. And I think because of these quite powerful forces that are also market needs, the market needs to function more efficiently and more transparently. I think over time, we'll see a lot more acceptance. And as we start to see acceptance, particularly from project developers and from consumers, I would expect to see more and more of the market looking at this technology to fulfill certain requirements. So looking forward, you're very excited to having conversations with project developers and consumers to kind of demonstrate what we can do today. And then with those stakeholders, actually building new innovations and new things that can kind of meet their needs, and kind of help this space grow and kind of show how the carbon markets can scale and we read, read lots of things about how the carbon markets need to scale 15 times by 2030 and 100 times by 2050. Well, how are they going to get there? And I think the technology we're talking about today could be one of the ways that we can get the market to kind of go through its next growth phase.

DJ May 18:28
Great. And then one last question, when you talk about collective liquidity. Can you break that down? What does that mean for maybe someone who's interested in participating?

Alex Taylor 18:38
Yeah, so it goes back to this, this automated market maker technology, and that technology is also referred to as a liquidity pool. The idea behind the liquidity pool is that rather than having a centralized entity, which is clearing trades, on behalf of market participants, you just create a pool with with two assets in that one asset would be the carbon credit and one asset be another token could be Ethereum could be cleaner could be whatever you so choose. And the idea is that by creating this pool with these two tokens in every time one of those assets, so either the cryptocurrency described or the carbon credit, once they're moved in or out of there, the pool will just respond to supply and demand. So when there's more demand for one, for one asset, of course, the price will increase with respect to the other one. And the idea is that this liquidity isn't created by a centralized actor. It's just publicly created. So perhaps there's a carbon project developer who wants to bring their carbon credits to the market and they can directly access that they don't need a centralized counterparty to take it off their hands and send it to the demand side of the market could be a carbon market trader or you know who are responsible for trading-getting liquidity in the market in a general sense, they could see opportunities perhaps, and start interacting with these liquidity pools, perhaps there's arbitrage opportunities between different pools. And likewise it at the other side for the consumer, the consumer can also come in and actually take credits out of the pool for their offsetting needs down the line. So it's this idea of, without using too much jargon and having like a permissionless system that people can interact with, hopefully through the buy side and the sell side, interacting with one another, you create a price signal from that pool based on the market trends. So this is really interesting technology that has been brought to the markets. I think it's been something that has been used extensively within the blockchain space that hasn't been really been applied to broadly within other markets. But we're starting to see financial institutions become interested in in this technology. We're interested in applying it to the carbon markets. So yeah, it's an interesting innovation.

DJ May 21:04
Yeah. Perfect. Well, thank you so much for being here today. It's been great to have you on.

Alex Taylor 21:08
Yeah. Thanks so much for having me. I enjoyed it.

DJ May 21:11
Cool. Okay, we covered a lot in today's episode, but if you're curious about the concepts that Alex mentioned, and you want to know more, check out the show notes. There will be a lot of resources there so you can dig a little deeper. And if you're interested in carbon and ecosystem services, come visit us to decode6.org We'll see you over there.