Climate Startups, Carbon Offsets, and Crypto

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Theranos, WeWork … Carbonos? With startups selling products that affect the planet's health, physical checks are more important than fancy crypto. The wild west of carbon offsets needs a sheriff.

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What happens when the startup mantra "fake it till you make it" is taken to the extreme? It doesn't end well. It happened with WeWork, a real estate company that was pretending to be a tech company. It also happened with the Silicon Valley unicorn Theranos that promised to revolutionize blood testing using a pinprick, but faked test results and failed to make it. The high-profile startup was brought down by an investigative reporter and an inspector from a "boring" government agency that regulated medical testing.[1]

The puncturing of the hype surrounding WeWork hurt only its investors and employees. The hype perpetuated by Theranos endangered the health of ordinary human beings. What about the hype from startups that are selling products that affect the health of the

[1] Hulu's The Dropout dramatizes the fall of Theranos.

entire planet?

As a climate scientist, I have mixed feelings about the recent surge in private funding directed at climate-related projects. Billons of dollars are flowing to startups are seeking to offset carbon emissions[2] or assist with carbon disclosures mandated by new financial regulations. It is inspiring that they are developing products to help improve the planet's health. However, unlike earlier startups that focused on energy technology like batteries, the newer startups are selling less tangible products like accounting and offsets. How much should we trust these commercial products?[3]

Some of the new climate startups also tout their use of crypto and the blockchain. Like many, I believed in the Theranos hype about helping humanity because I didn't know any better. But I know how the climate system works and I also have some experience with cryptography, having worked on open-source email encryption.[4] That makes me rather wary of the hype surrounding this new breed of climate startups.[5]

Private innovation plays an important role in climate solutions. Pledges for curbing emissions rely on advances in electric vehicles and the development of efficient batteries, solar panels, and wind turbines. The price of renewable energy has dropped dramatically over the last decade because of such innovative products, which are subject to the *caveat emptor* or "buyer beware" principle. You can verify the range of the electric car or the efficiency of a solar panel after you buy it. But products like carbon offsets and carbon accounting are quite different. Like diagnostic blood tests, only an independent authority can certify if the product works. Just as a false negative test can hide the progression of disease, a flawed carbon offset can prolong global warming and the associated harm.

1.1 Climate and crypto

Startup culture tends to lean libertarian because regulations can stifle innovation in many areas. But in the climate space, promising "solutions" may be worthless without strong regulations. Combining climate solutions with hot trends like crypto, as some startups are doing, is not a good idea.

Using computers to mine proof-of-work crypto currencies consumes prodigious amounts of energy, which often results in increased carbon emissions directly or indirectly.[6] Other crypto features like the blockchain facilitate anonymous transactions without middlemen, but these obfuscatory features may actually work against the accountability essential for climate solutions.[7]

[2] Stripe, Alphabet, Meta, Shopify and McKinsey are trying to spur the market for carbon capture. Stripe teams up with major tech companies to commit $925 million toward carbon capture. (CNBC)

[3] For a cautionary tale about the pitfalls of corporate climate assessments, see the previous post in this blog: The perils of predicting perils.

[4] In 2001, I developed Enigmail, a data encryption and decryption extension for Mozilla Thunderbird, and handed it over to its current maintainer in 2003.

[5] Meet the CEO of the Adam Neumann-backed startup that's trying to save the Earth with crypto (BusinessOfBusiness)

[6] Using renewable energy to mine crypto currencies still reduces the energy available for other uses. Some crypto projects claim to be eco-friendly because they rely on using only *excess* renewable energy for mining. This flexible demand approach may incentivize additional renewable energy installations, if investors believe there will be a sustained long-term demand for excess renewable energy. But for a proof-of-work crypto currency not to harm the environment, *all* its mining activity would need to be carried out using only excess renewable energy, not just a portion of it.

[7] The Crypto Industry Was On Its Way to Changing the Carbon-Credit Market, Until It Hit a Major Roadblock (TIME)

Consider the following transaction: MegaCorp purchases 10,000 tons of carbon offsets for $1 million from the green startup Carbonos using bitcoin. The beauty of the blockchain is that it allows the money transfer to be validated without the need for a trusted intermediary. But what about the validity of the carbon offsets purchased? This cannot be verified by doing math on a blockchain. You need boots on the ground to verify that the captured carbon stays underground. When it comes to carbon capture, the "blockchain" one should trust is the physical chain of custody of blocks of carbon from extraction to permanent sequestration.

If MegaCorp is buying offsets merely for public relations to claim carbon neutrality, or to hawk cheap offsets to its retail customers, it may be a case of "buyer doesn't care" rather than "buyer beware". Both parties may be quite satisfied with a shoddy but cheap product.[8] Only an independent regulatory authority, much like the "boring" government agency that inspected Theranos, can be trusted to verify offsets and protect the health of the planet.

Once we have a trusted authority to verify carbon accounting and offsets, there is really no need for the trappings of crypto, except perhaps to impress venture capitalists. An important reason for investor fascination with crypto is the lure of quick profits. Although that fascination may have faded a bit with the recent downturn in crypto valuations, it has not gone away in carbon markets.[9]

When used for investment rather than for transactions, a bitcoin is rather like a digital tulip[10]—it has no intrinsic value beyond that determined by the market. It is not the cryptographic features of bitcoin that allow investors to make a quick buck, but its limited supply and appreciation potential. If you can predict the future value of any tradable commodity, you can profit from that. That is how you profit from trading bitcoin, which is no different from trading stocks, or emissions/offsets in a carbon market. There is no need for a complicated blockchain to buy and sell stock listed in an exchange.[11]

1.2 Carbon offsets

Many carbon offsets, especially the cheap options that businesses like airlines offer,[12] remind me of the famous P. T. Barnum quote: "There's a sucker born every minute".[13] As a human being worried about climate change, I too would like to believe that we can miraculously find a way to suck carbon out of the atmosphere at an affordable cost. But as a climate scientist aware of the complexity of the carbon cycle, I am not going to believe that we have sucked out carbon until an independent expert confirms it. I'd rather contribute to a charity that purchased solar panels for developing countries than waste money buying cheap carbon offsets of dubious provenance.

[8] Zombies on the blockchain (CarbonPlan.org)

[9] Falling prices for cryptocurrencies test the logic of the 'tokenomics' behind Web3 startups, but true believers think the real problem is existing securities regulations. Adam Neumann's 'Goddess Nature Token' Is the Future of Crypto—for Better or Worse (Wall Street Journal)

[10] 'Digital tulip' or new asset class? Bitcoin's bid to go mainstream (Financial Times)

[11] One touted benefit of the blockchain is that it can prevent "double-counting" of carbon offsets. But it may be better to ensure uniqueness more simply by having a single trusted exchange to issue the equivalent of share certificates for offsets, with serial numbers and ownership tracking. (Without a trusted authority to coordinate physical verification, the whole carbon market becomes suspect anyway, crypto or no crypto.) We don't need the complexity of tradable crypto tokens to ensure uniqueness. Let's not forget that tranching of mortgage-backed securities to make them more tradable added complexity that obscured the risk of subprime mortgages, paving the way for the 2008 financial crisis.

[12] Everything you need to know about carbon offsetting for your flights (ThePointsGuy)

[13] The quote is usually attributed to P. T. Barnum, but the story behind it is more complicated. (Medium)

Direct air capture of carbon can potentially be an effective and verifiable solution to offset emissions, but it is not currently affordable and there is no guarantee that it will become so in the future. This and other carbon capture technologies are certainly worth researching, but with the understanding that failure is an option. Focusing too much on capture technologies can distract us from the most effective way to reduce carbon emissions,[14] which is to eliminate the demand for fossil fuels by providing affordable alternatives that use carbon-free energy sources.

Nature-based conservation efforts to offset carbon emissions sound sustainable, but their hard-to-quantify mitigation benefits may turn out to be transitory [15] or even negative.[16] Like describing plastic apparel as vegan leather, eco-friendly names for crypto tokens may just be creative marketing. If you truly care about nature, don't rely on nature-based solutions to offset carbon emissions, but continue to support them as you have done in the past, simply as worthy efforts of nature conservation. In other words, grow your natural beans but don't count them as part of any carbon offset budget.

We don't leave the certification of medical drugs and treatments to industry self-regulation, because the stakes are too high to allow mistakes. We should apply the same standard when the health of the planet is at risk. An independent regulatory authority is essential to *measure, report, and verify* all carbon accounting and offsetting practices. Since there is an incentive to game the offset system even at the national level, the regulator may need to be a trusted international authority.

The verification authority must be able to carry out unannounced physical audits of the carbon offsetting process following established scientific protocols. Lopsided funding for glamorous carbon startups without commensurate support for unglamorous verification infrastructure is a recipe for attracting Theranos-like business models.

Crypto isn't some magic pixie dust. A sprinkling of crypto dust on climate solutions is superfluous at best and can be harmful at worst—if it reduces transparency or increases energy consumption. Crypto enthusiasm may never go away in finance and investing, but keep it out of climate solutions for the planet's sake.

1.3 Comments

Note: For updated comments, see the original blog post and the anouncement tweet.

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[14] The climate crisis can't be solved by carbon accounting tricks (The Guardian)
[15] Let's Not Pretend Planting Trees Is a Permanent Climate Solution (New York Times)
[16] The Climate Solution Actually Adding Millions of Tons of CO2 Into the Atmosphere (Propublica)