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Virtual Event Series

Energy Transition Investment Blueprint

Guest Speaker:

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Hosts:

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DiffuseTap: Energy Transition Investment Blueprint

Last time on DiffuseTap, **Robert Ethier, Co-Founder and Managing Partner at Impact Science Ventures,** talked to us about investing in Cleantech 2.0, which climate tech opportunities are overhyped or underhyped, and why the energy transition movement might be the biggest investment opportunity of our time.

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DiffuseTap

This networking session is part of our weekly virtual events series. Networking (you'll bump into at least a dozen high caliber fund managers) meets purposeful (you'll tap into brand-new sources of ideas)... straight from your armchair like a boss.

Meet the Speaker

ROBERT ETHIER is an investor, entrepreneur, and startup advisor with almost 20 years of experience in the financial markets. He is currently a Co-Founder and Managing Partner at Impact Science Ventures, a Cleantech-focused fund that seeks leading innovators with game-changing technologies and breakthroughs in the fields of hard science.

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KENNY ESTES: Mr. Ethier, thanks for being here. Do you want to tell the folks a little bit about your background and what you're up to now?

ROBERT ETHIER: Yeah. Thank you for having me, Kenny. I appreciate being here and the diversity of the background of the folks in this group. It seems like a great group of people. Briefly on my background. I am more of a finance nerd with a quant background. I have a couple of undergrad degrees in financial markets and accounting, an MBA and I am a CFA Charterholder.

I wanted to get into portfolio management, so I went to an insurance company with a small investment team and a sizable AUM.. I was handed about a billion dollars a day after Lehman Brothers went bankrupt. It was a really great time to invest - being able to take advantage of market dislocations and finding value where others didn't.. I did that for about a decade, excelling at finding long term, global macro economic opportunities and then deploying capital within those opportunities.

Some of you may be familiar with Cleantech 1.0. The timeframe for that was from 2005 to 2015. A lot of solar was coming online, and there were a lot of other alternative energy technologies. I was an active investor during that time, but I actively avoided anything in Cleantech 1.0 strictly because the economics never made sense. I was not a climate denier, but if you're talking about end users having to pay 30, 40, to 50% more for products they're already getting and having a much worse user experience, that just never makes sense.

From an economic standpoint, I did change my mind around this in the 2015 to 2016 timeframe. I started thinking of the effects of climate change being more of a much more near term thing than long term. In other words, being a 2020 thing rather than a 2050 thing. Climate change is going to cause very acute and critical pain points around the globe. If you can solve those kinds of problems, there is typically a lot of economic opportunity behind it.

So, with my investor hat on, I came up with this thesis around the next generation of the industry. I think other people have better branding skills than me, and started calling it the energy transition, which I think sounds better.

And so, I wanted to spend the rest of my career doing that. I left that position, moved to San Francisco, did an MBA at UC Berkeley, joined an amazing organization called Activate, where I got to mentor folks working on early stage, what we called "hard technologies." These are things that have a lot of R&D in front of them and still have science risk and Typically, a physical asset is involved with that, including energy generation and storage, manufacturing, etc.

My work at Activate also included working on a Department of Energy-funded grant to figure out what went wrong with Cleantech 1.0, and how investors could better take advantage of Cleantech 2.0 and better invest in these types of companies. That research became the foundation for the fund that I launched in 2021, called Impact Science Ventures.

We have a really unique investment strategy, but we're very much focused on the early stage deep tech side of things. Our focus is on great, very scientific innovation. There is a lot of IP and R&D going on. I will stop there for the quick intro.

KENNY: That's great, I appreciate that. We'll actually just go right into that. When you're investing, where do you typically invest? I'm guessing that a lot of this is coming out of academia. So, how early do you get in? How are they financing before you come in? What does that early stage hard science life cycle look like?

ROBERT: Like you mentioned, companies are typically coming out of academia, or the National Lab ecosystem. The US has several National Labs located around the US that have multibillion dollar annual budgets. Some of these facilities have equipment that is literally only located at that particular lab site. There are a lot of valuable resources available, and you have really smart people working on these things.

What they typically don't have is the entrepreneurial know-how or mentorship or network to actually start a company. This first phase is really the research phase of doing the experiments and finding out whether or not you have an innovation or a tool that you think will actually work in the real world. So, step one is doing the experiments to find out if this is actually a potential scientific breakthrough, and If it will potentially work in the real world.

That is usually taken care of by university national labs government funding. The next step is what I call the science de-risking side, as well as company de-risking. It's the process of knowing if this person is actually able to start a company, or if they can find someone to work with to start a company.

This is where incubators, accelerators, and government programs such as the program we had when I used to work for Activate come in. They have a mentorship capacity to say, "hey, we have folks on our team that know how to start companies, and how to scale companies and teams. You have the science know-how. We need to work together to actually build this thing and see if it can work."

At this stage, there are some venture funds involved. This is where we start to get involved at Impact Science Ventures. We have what we call a Scout program, where we're writing a lot of 100k checks into a lot of different companies. The key for us at this science de-risking stage is going from the idea of "okay, I've got some really interesting lab experience experiments to a prototype that works outside of the lab, so that we can say the science has been proven."

That's a multi-year, multi-million dollar process. It's very risky. There is a lot of failure in that process, and it would be very expensive to fund it with equity. That's what we found out during Cleantech 1.0.

So, what we do is we'll invest very small amounts of equity, which won't pay for that science de-risking. But then, we plug them into our partners, Activate being one, where they can fund them with a minimum of half a million dollars, but it's often up at 3 million or more of non-dilutive funding via government and philanthropy, and that pays the science de-risking.

Once the company has gotten to that point, and they either have a prototype that works or something they can show it to customers, and after that it's really more about market de-risking and team de-risking. That is when more venture firms are starting to get involved, with early stage, series A, some seed, and some B. Once you get past that stage of actually finding your market fit, your go-to-market strategy to get the team in place, then it's more about the scaling side. That's when you have more mid-

to late-stage venture funds coming in with government financing, corporate development, and that kind of stuff.

KENNY: That's fascinating. I like the idea of, like you said, you're using academia and these grants to de-risk things for you. A little bit of equity, mostly grant money, but non-dilutive as a general rule. And I'm guessing you pop money in once they prove that there is a product market fit, and they get to that scaling.

ROBERT: Yeah. This was one of the key findings of my research into Cleantech 1.0. The failing by the venture community at that point was putting a lot of equity money into what were more or less science projects. There is just not a good use for equity dollars.

KENNY: Especially when there's grant money on offer, right?

ROBERT: Yeah. The whole idea is you have to change that capital stack, especially at the early stage.

KENNY: Okay. Would you call that seed stage, where you come in? What is the term for this?

ROBERT: Our Scout check is coming in at pre seed. Pre seed or company formation is typically where the first money is coming in.

KENNY: Okay, that makes sense. All right. I like this strategy, and I think we had somebody guest a few weeks back that had something similar. Let's go high-level. You're talking about hard science investments. There are a lot of areas there. What's overhyped, what's underhyped? What are you excited by? What do you think people should probably stop going crazy about?

ROBERT: At the risk of getting the virtual eggs thrown at me, I'll start by saying nuclear is overhyped. I say that from the perspective of an investor, not a global citizen, especially whether you're talking about small modular reactors, or if you're talking about fission or fusion.

With the capital requirements to get to scale and the timeframes involved, if you're just backtracking that into what your investment is, what you're investing in right now, the different fundraising stages you have to go to and when you have a potential liquidity opportunity, it's really hard to map that out and make it make sense.

That's not to say that it's not worth investing in from a government perspective. I'm actually very pro nuclear, as far as the energy grid goes in general. I just have a really tough time seeing how investors are going to make positive returns or venture-like returns in those areas, just due to those dynamics.

KENNY: Mostly, this is going to be actual plants, right? That's really the only way you are going to monetize it. My uncle, his entire job is decommissioning nuclear power plants, so that sounds right. He's got a pretty good career right now, so that sounds accurate.

So, nuclear is overhyped. It's hard to make your money back. Also, it's kind of commoditized, right? It's not new science at this point.

ROBERT: I mean, the idea of the fission site and the small modular reactors is if we can create a manufacturing facility for plants, does that make it more cost effective? I think thus far, the answer is no, but maybe they can prove that out. But even beyond that, on the fusion side, I have not really heard many folks solve for even just beyond the capex involved, solving for the fuel side of things.

If you look at tritium being one of your supplies on the fuel side, and a single plant requiring more than the world's supply of tritium, that's a problem. I think folks just think they will solve for that, but it decreases the end efficiency of the plant. It decreases the attractiveness of it from an investor standpoint. That's why I'm not anti-nuclear, but I think it's overhyped from an investor's standpoint.

KENNY: Well, I have to say it's not very controversial, because I think you got a lot of comments there in the chat that are plus one-ing you on that one. What about hydrogen?

ROBERT: Hydrogen is an interesting one. It's almost both overhyped and underhyped. I think that from the viewpoint of thinking hydrogen is going to replace fossil fuels as a key energy source globally, that's overhyped. I don't think that's going to happen. Petrochemicals have had the ability to be easily and efficiently transported with minimum the loss of energy.

Hydrogen does not have that ability. The idea of transporting hydrogen over long distances, whether it be through pipelines or even through ships, is for lack of a better phrase, a pipe dream. Just the physics involved with that becomes very difficult, very quickly. And if the goal is to just try and convert it to ammonia, and then transport the ammonia, which is also not that easy to transport, and then turn it back into hydrogen and then use it, your overall efficiency losses from that are massive, and the economics will never make sense. I think that people will never use hydrogen as an in-home heating fuel source. A lot of that has been overhyped.

I think where it's underhyped is, during Cleantech 1.0, there is a pretty big graveyard of hydrogen startups. The market wasn't ready for it yet. There is, from our viewpoint, a lot more demand from the industrial side of powering their fleets or their operations with hydrogen. What that ends up looking like is locally sourced and locally used hydrogen plants.

That means creating hydrogen where it's being used, rather than creating hydrogen from a centralized point and then shipping it out. So, I think hydrogen will be a bigger part of the economy 10, 15, or 20 years

from now, but it's going to be very industrial-focused, and much more of a locally-sourced and used type of thing.

KENNY: Interesting. So, on-site power consumption. Sounds great for Bitcoin mining, I have to say.

ROBERT: Potentially. Another one that I have to touch on for overhype, because in the sector that I work in this is one that gets some of the most attention, and perhaps least deserved, is direct air capture.

This is the idea that there's too much carbon in the atmosphere, and to hit the Paris target of 1.5, we're eventually going to pull some of that carbon out. It's the idea that you can just put a bunch of giant fans and it will suck air through them and capture the carbon, sequester it, and then pump air back out. As you might imagine, the concentrations of carbon in the atmosphere are very low. You can't get past that.

There is really just so much you can do on the efficiency side of that, and it makes economics very, very difficult. These projects, even in the best case scenario, are still pretty expensive. Not to mention, if you're looking at the electricity you would need to actually run those facilities, you would actually get a better net carbon reduction by putting that electricity towards the grid, or putting it toward an industrial plant, or putting it forward storage.

Basically, anything else besides direct air capture would be a better use of that electricity. There are obviously a lot of director air capture startups. We've looked at a bunch of them. It's just that the economics don't really make sense. Point source is a whole other thing, but just talking about direct air capture as a field, that's really tough.

KENNY: Fascinating. I guess that makes sense. You have to be net beneficial doing that. Interesting. What about the underhyped?

ROBERT: I'm going to go broad on this. Think of really old, ugly, dirty, unsexy industries. Steel, cement, commodities, chemicals, and mining minerals outside of lithium. The stuff that has been around for hundreds of years. There has been some development in these areas, but there's a lot more to go.

Putting my investor hat on, I think that right now, imagine we are on the ground floor of being able to invest in Carnegie Steel, or Dow, or DuPont, or 3M in their Series A round way back, whenever it was when they first raised capital. I think that's the kind of once-in-a-century type opportunity we have right now in some of these industries where there is a critical mass behind this movement of going towards a low carbon economy. Even the big players are looking into this and putting more work into the R&D space.

If you're the first to market making cement, ordinary Portland cement, the same cement that's been used for the last 200 years, and you can do that in a carbon negative fashion at the same price point, you have a trillion dollar market that you can basically access as fast as you can build cement plants.

In steel, there has been progress. But even with the green steel plants, you're still looking at a 30% price premium. If you're looking at the same price, one you get a carbon credit for it, and the other one you don't, you're going to go for the carbon credit every single time. It's the same in cement. A lot has happened in the chemicals industry.

On the metal side, there is a severe lack of some of our base metals long term, especially looking at copper. There is a lot going on at the lithium side of things, but I think there is actually a bigger need to increase our copper supply.

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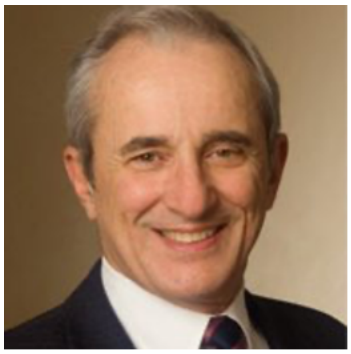
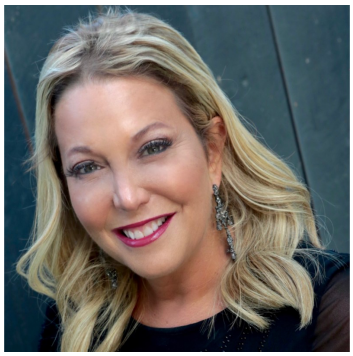


Dennis Chookaszian

Corporate Director, CME Group

DiffuseTap: Institutional Grade Governance

Sharing his decades-long expertise on corporate governance, Dennis talked about how to avoid a co-partnership going sour, the problem with overly idealistic CEOs, and the importance of keeping your board in check. Read on



Susan Brazer

CEO & Founder, LionShare Media

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Susan described the 2020 digital media landscape; the evolution of media distribution; how converging, emerging technology points to the metaverse; and the prospect of having an open, decentralized, and free Web 3.0 marketplace. Read on

Raj Mukherjee J.D.

VP/Global Head of Tax, Binance.US

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Raj explained the complexities of the US crypto tax landscape, how he built a dynamic tax information system for Coinbase and Binance from scratch, and how investors can profit from crypto without getting caught in a taxation mess. Read on

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