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Accelerating the Energy Transition | Episode 8
Vijay Vaitheeswaran, Global Energy and Climate Innovation Editor at The Economist

On the series finale of 'Accelerating the Energy Transition', host David Greely, Chief Economist at Abaxx, welcomes to the studio Vijay V. Vaitheeswaran, Global Energy and Climate Innovation Editor at The Economist.

Vijay Vaitheeswaran (0s):
The answer is a fundamental difference. One is that the world has gotten much more serious about climate change. That is the animating reason for doing these investments. Back, 15 years ago, was some distant concern about climate change. It wasn't a societal concern, certainly in the United States, the way it has been in Europe. There is no meaningful regulatory constraint to rub up against, which, of course, innovation actually works better when you have some constraints. Working with a blank sheet of paper is a terrible way to innovate and having a strong stick like a carbon price in Europe, for example, some mandate, or ban on coal in some parts of the world. That's a tremendous spur to innovation to investment and to come up with other alternatives that can help technologies leapfrog in addition to just funding cool tech, right?

Vijay Vaitheeswaran (49s):
That's the Silicon Valley software model of funding. I think this time, there is the credible and actual regulatory, political, and societal acceptance of climate change and a desire to do something about it, and also to monetize it. If you look at the ESG movement, that is the Environment Social Governance movement of investment, there is a lot of money seeking green returns.

Announcer (1m 13s):
Welcome to Smarter Markets, a free weekly podcast featuring stories from the icons and entrepreneurs of technologies, commodities, and finance, ranting on the inadequacies of our systems and riffing on ideas about how to solve them. Together, we examine the questions are we facing a crisis of information or crisis of trust and will building Smarter Markets be the antidote?

David Greely (1m 41s):
Hello, Vijay. Very glad to have you with us here today and welcome to Smarter Markets.

Vijay Vaitheeswaran (1m 45s):
Great to be with you.

David Greely (1m 46s):
For the benefit of our listeners, I thought I would give a quick introduction. You're currently the new global energy and climate innovation editor at the Economist where you spent nearly three decades covering politics, economics, business technology, and innovation across energy, climate, and healthcare. I'm really looking forward today, given that broad perspective you've had to really dig into a few of the interesting issues that we're seeing now in the markets. Going back with having three decades of the Economist, you covered the last attempt at a clean energy transition 20 years ago. Then we had the Kyoto protocol from 1997 and the first development of compliance and voluntary markets with both the clean development mechanism and the Chicago mercantile exchange.

David Greely (2m 38s):
Those didn't succeed. We also had a period of very high oil prices that led to investment in things like shale, tar sands, and renewable fuels that are still with us today. What I'd love to start off with today is it seems like we're going through another attempt at a clean energy transition. How do you compare what you're seeing today with what you were seeing 20 years ago?

Vijay Vaitheeswaran (3m 4s):
It's a powerful question, I guess it gets right to the heart of what's different this time, right? We've seen this movie before in some ways, and that's true. We have seen attempts to encourage, let's say, renewable energy. It was called the clean tech boom, back in the day, something like 15 years ago. There were Silicon Valley luminaries like John Doerr, Vinod Khosla, who were leading venture capitalists that tried to encourage advanced cellulosic ethanol and technologies like that, and solar as well. It must be noted. By and large, that particular investment boom didn't work out very well for the venture capitalists or the startups that were involved. It was a bit of a bust. Today, we have something called, clean tech is a dirty word, so now we call it climate tech, which is a similar set of industries.

Vijay Vaitheeswaran (3m 48s):
A little bit different because it also includes maybe food and ag, that sort of thing. It's very tempting to be skeptical as I initially was saying, "All right, I've seen this movie before. What's really different here? The answer is a fundamental difference. One is that the world has gotten much more serious about climate change. That is the animating reason for doing these investments. Back, 15 years ago, was some distant concern about climate change. It wasn't a societal concern, certainly in the United States, the way it has been in Europe. There is no meaningful regulatory constraint to rub up against, which, of course, innovation actually works better when you have some
constraints. Working with a blank sheet of paper is a terrible way to innovate, and having a strong stick like a carbon price in Europe, for example, some mandate, or ban on coal in some parts of the world.

Vijay Vaitheeswaran (4m 39s):
That's a tremendous spur to innovation, to investment, and to come up with other alternatives that can help technologies leapfrog in addition to just funding cool tech, right? That's the Silicon Valley software model of funding. I think this time, there is the credible and actual regulatory, political, and societal acceptance of climate change and a desire to do something about it, and also to monetize it. If you look at the ESG movement, that is the Environment Social Governance movement of investment, there is a lot of money seeking green returns. We can have a separate conversation in a little bit about how much of that is bogus, poorly structured, greenwashing, or lacking in transparency to put it in a mild way.

Vijay Vaitheeswaran (5m 22s):
Nevertheless, those factors did not exist in the earlier wave of investment and enthusiasm for clean technologies.

David Greely (5m 32s):
Now, we have the ESG movement, we have the regulatory environment, and, as you said, the recognition that we need to move now, as opposed to anticipating something much farther down the road, which is a little bit more of the situation from the early 2000s. Do you think there are any other lessons that we should take away from what happened in the 2000s, either in terms of the types of technology or the role of government verse markets in the fostering of that innovation?

Vijay Vaitheeswaran (6m 1s):
Sure. We can keep digging into it a bit further among other things, right? One of the things I covered at the time was the Enron collapse, as well as the role that Enron and others in the Texan Cowboys of power trading and gas markets that manipulated the California's power markets, when California deregulated its power system badly and led to massive power crises. It ultimately led to the ouster of the governor at the time, Gray Davis, who was recalled, but also taught some useful lessons about both a blind faith in market forces that led to certain kinds of deregulation. It was held for example at the federal level, the CFTC. It was controlled by ideologues at the time and took a view that this area didn't need to be properly regulated, but also the importance of getting regulation right.

Vijay Vaitheeswaran (6m 49s):

That is the role of government and it is important. Even Adam Smith, if you go back to the guru of free markets, never argued for laissez-faire in everything. He knew that companies will tend towards oligopoly, right? He argued for a vigilant night watchman so that you don't have cartels. In a particular market like energy, like power, which are prone to concentration, it's easy to have cartel power, either monopoly power or oligopoly power, but you need to have a vigilant regulator. That is one of the lessons that comes out of the California reform. Also, you need to make sure that you don't misguidedly force your companies into short-term contracts. For example, banning long term contracts and so on.

Vijay Vaitheeswaran (7m 30s):
California made that mistake back then. Europe, today, has repeated a version of that mistake in its natural gas markets where, again, a certain, I would argue, sensible desire to introduce market forces into its gas markets, to get away from the traditional way of linking natural gas prices to long-term oil contracts. That linkage was always questionable. There really are different sorts of commodities, especially with liquified natural gas taking off. You're beginning to see more of a fungible global market. What happened was Europe didn't think ahead sufficiently. You ended up with a marketplace in which it was excessively reliant on one supplier, Russia, and Gazprom.

Vijay Vaitheeswaran (8m 10s):
We know that Putin is clever at playing games with market power, but, ultimately, reliant on the spot market for LNG, which doesn't lend itself to long-term contracts. Europeans are getting outbid by the Chinese and the Asians who want that LNG more, are willing to pay more for it, and for structural reasons we can get into, why they're able to pay more than Europeans. This is, actually, I would argue, not a fault of the marketplace. The market's working as one would predict and expect to. It's a fault of how deregulation took place. That is a failure of proper regulation.

David Greely (8m 44s):
It does seem like Europe is creating quite a bit of climate news these days in addition to the energy price spikes related to some of the movements that you've been discussing. We've also recently had the conclusion of the COP26, the Conference of Parties, UN climate change conference in Glasgow. I really enjoyed the coverage that you gave to it on your podcast to a lesser degree. Now, with COP26 in the rear view mirror, what does the path forward look like to you?

Vijay Vaitheeswaran (9m 16s):
The UN process is a mixed bag. It's easy to criticize because it's messy, it's consensus driven, it's slow, and it appears to be going nowhere. It's easy to see the flaws in it, which are evident, especially because of all the factions and the lobbying that are involved, but I am actually of the view that it's essential. You cannot solve a global problem, an intergenerational problem, one that affects every corner of the world in 200 plus countries, unless you have everyone involved in coming up with some form of agreements on the solutions. The analogy that works for me is to think about, for example, world trade liberalization. Though there's some economic nationalists now that
want to put the borders up, broadly speaking, I think most reasonable economists and others would agree that world has benefited, particularly the developing world, from open borders, greater globalization.

Vijay Vaitheeswaran (10m 10s):
We saw for years, and even decades, protectionists fighting opening up a borders. We saw negotiators go to something called a GATT ground of Trump talks, the general agreement on tariffs and trade. They bang their head against the wall, year after year, and make a little bit of progress on one sector or another. Ultimately, they're able to get the world trade organization and work on sector by sector liberalization. There's still a lot more room to go. There's protection on agriculture and financial services, but, ultimately, I think that that kind of model, and same thing we saw with the Soviet in the US during the cold war on arms reductions and limitations on nuclear weapons, there is a value to thinking long-term when there are long-term problems.

Vijay Vaitheeswaran (10m 51s):
This is about as long-term as you get. Carbon dioxide stays in the atmosphere more than a a hundred years. We need to have solutions that will endure and that will both work quickly, but also be able to adapt over time to responding technologies, to

responding conditions, and new science. I think that's why I support the UN process, as flawed as it is.

David Greely (11m 15s):
I think it's great to have your insight into understanding what people should be looking for in order to judge whether we are making progress or not, because it's easy to look and say to an outsider, when you look at the number of pledges that have been made,
even with that, the UN projects that we'll see temperature rise, something like 2.7 degrees Celsius above pre-industrial levels. On the one hand, it seems like we're not getting near where we need to be. The limit temperature rise to the one and a half or two-degree type targets, but what's happening or not happening during COP26 that you look at and say, "Well, even though we're not there yet, I see that we're making progress and I can maintain some confidence in the process?"

Vijay Vaitheeswaran (11m 60s):
If we look at what are the actual levers by which we'll tackle the climate problem, there are big buckets. You can look at mitigation that is reducing emissions in the first place. We can look at adaptation, how do you deal when the problem happens, the sea level rises, and your family gets flooded, or your country's under water and so on. Of course,
we can think within that with mitigation, there are efforts to deal with the actual sources of emissions that are big. Coal and greenhouse gases are a well-identified problem. We're having a hard time getting countries to agree to a phase-out or phase-down of coal. There was a, at the very last minute at this COP, an intervention from India that has a lot of coal and doesn't plan to get rid of it anytime soon.
Vijay Vaitheeswaran (12m 44s):
that prevented the world from agreeing to phase-out coal, they wanted to phase down. That small change actually means a lot because the carbon content of the coal in India, in China, in Indonesia, and a dozen other country, South Africa, which gets almost 90% of its electricity from coal still, that can make almost all other attempts at climate mitigation irrelevant. We need to find a solution to get off of coal and onto perhaps natural gas as a bridging fuel. If we can control the fugitive emissions problem of methane, ultimately, of course, purely carbon-free or very low carbon forms of energy be that renewables or possibly nuclear, although that too is a political problem, but it's not an engineering problem in my view.

David Greely (13m 27s):
It seems like there's always the tension between the developed countries and the developing countries. When you look, I think, with carbon, as you said, it stays in the atmosphere for hundreds of years. A lot of the developed countries have put a lot of the carbon that's in the atmosphere as a by-product of their own growth. That tension between who's responsible for the damage that's been done versus who's going to pay, who's going to limit the amount of carbon that they release in the future, and whose economies are going to be slowed as an effect of that, how do you see those negotiations occurring between the developed and the developing countries? Is that the biggest sticking point or is that just one?

Vijay Vaitheeswaran (14m 10s):
Honestly, this was a much bigger issue a decade ago or 20 years ago when most developing countries, China and India, most prominently among them would say the moral argument, and they're surely right. It was the industrialized economies, the US most notably, but also Europe and Japan that put the stock of greenhouse gases into the atmosphere. It's morally reprehensible to demand that poor countries stay poor and their people suffer both the consequences of climate change as well as increased poverty, absent economic growth, or lower economic growth because it could not rely on the energy that was made possible by fossil fuels that the rich countries got rich from. That was a clear cut moral case. That's partly why we broke the log jam in the UN negotiations with the concept of common goals, differentiated responsibilities.

Vijay Vaitheeswaran (14m 55s):
The world agreed we have common goals. We want to curb climate change, especially as the science became more secure over time and more widely agreed what the consequences would be, became pretty clear very few places on earth will benefit, and no country can reliably benefit. Even Russia, with potential gains for Siberia warming up, has plenty to lose as well. It became clear that we need to have common goals, but that rich countries would take on stronger responsibilities. They would go first, they would spend

more, they would help develop in countries as well through a direct
transfers of resources, but also technologies and multiple other ways. That's pretty well agreed. Really, India is the most important holdout on that, and particularly under Modi, the current prime minister.

Vijay Vaitheeswaran (15m 39s):
He has taken quite a strident stance. That's a bit of a throwback to the old positions. Almost all of the developing countries are singing from the same song sheet where they say, "Look, we can already see the effects of climate change." South Africa is a great example, heavily coal-reliant, but they have come up with a very aggressive plan for the national utility, Eskom, to transition towards non-coal forms of energy. Heavily reliant on renewables, but with a social dimension because a lot of people work in the coal sector, miners and others who are reliant on coal-related industries and mining-related industries in a country that already has 45% unemployment.

Vijay Vaitheeswaran (16m 23s):
You can't throw all these people out of work by shutting down coal and plunging the economy into chaos. That would be a greater offense and an injustice than the threat of climate change 10 to 30 years from now. They have a program for transition in clean energy development that the rich world agreed to fund to the tune of many billions of dollars because they were smart about it. They said, "Yes, we need to do this. We know we're part of the problem, but you need to help us. Here's a plan and here's how we're going to help our ordinary people so that they're not unjustly affected. In fact, they can benefit from the transition by working in the renewables industries, getting training. Communities can have development funding." That's a model and there are other countries.

Vijay Vaitheeswaran (17m 3s):
The Philippines is looking into the same thing and others as well. The Asian Development Bank has some interesting financial innovations too, for the early phase down of coal plants. In return, they would fund and reduce the risk for investing in clean energy in those Southeast Asian markets in that case. I think there's a lot of innovation that comes from public-private approaches that really is the legacy of the COP26 that just ended.

David Greely (17m 29s):
It sounds like countries have found a way to bridge that divide and move forward, which is terrific. I'm curious though. What makes India a bit of a holdout right now in your opinion?

Vijay Vaitheeswaran (17m 40s):
There is a very strong sense that India has lots of very poor people, which it does, much more than China. China, 20 years ago, could claim this, but China had a miracle of public health, good public policy, and economic growth and there was perhaps the biggest beneficiary of globalization in being able to lift up their people towards the middle classes. Hats off for the success that they've been able to achieve. It's much harder for China to play the "Woe is me" card. On the other hand, there is a legitimate amount of subsistence poverty, as well as energy poverty in India that needs to be addressed. It's only right for the Indian government to care about first before they take on expensive new technologies or make grand commitments to shut down coal, which is the bedrock of their electric power generation.

Vijay Vaitheeswaran (18m 24s):
At the moment, they don't have enough power generation capacity. They often suffer from blackouts. They have an unreliable grid. When you're confronted with these sorts of problems and you need a lot of economic growth to keep the population even stable, never mind growing in income per head, that's really the first focus of the government. Secondly, they are very much in the moralistic view that this is not a problem that India created. "If the world wants to go towards net zero, fantastic. Let's have a net-zero world. We will be the country that goes over and you can cut extra so that we can get to net-zero by you cutting an extra 20%. Why should we cut from our future budget when we didn't create this problem?

Vijay Vaitheeswaran (19m 9s):
If you want us to do more, you pay us." They asked for a trillion dollars in resources, which, of course, is crazy a sum. No one's going to give India a trillion dollars. On the other hand, the positive way to look at this, for India to achieve its own economic growth and its own levels of prosperity that India wants for its people and the Indian people want, they need to dramatically improve their own energy infrastructure and growth potential. They could use a trillion dollars in private sector investment, and hopefully, a lot of it will be in clean technologies. They've got an interest in wind. They've huge wind and solar capacity. They could become a hydrogen superpower. They have a phenomenal resources to tap into for clean hydrogen.

Vijay Vaitheeswaran (19m 52s):
Given all of this, if they create the right kind of laws, regulatory regime, make it investor friendly, attract the capital, particularly foreign capital but private capital to go along with smart government policies, then you could really see hundreds of billions of dollars certainly flowing to the Indian power sector and the Indian economy, lifting up India in the positive direction, as well as helping climate change.

David Greely (20m 14s):
That's certainly could. You focus so much on this podcast on the role of investment and letting the dollars into the infrastructure that's required to build that next-generation energy system that's both reliable, affordable, and low carbon, environmentally responsible. Over the past few years, you've written a lot on some of the big trends that you're seeing in the world. those have included, and I'll paraphrase these poorly so please correct me, the idea that you've had a rise in economic nationalism, a slowdown in the pace, or even a retrenchment in globalization.

David Greely (20m 57s):
These trends have often been accelerated to some extent by the pandemic. At a time when we need to be coming together more to solve these common problems, how do you see some of these other trends affecting that?

Vijay Vaitheeswaran (21m 12s):
It is a curious time in which you live, isn't it? Obviously, first and foremost, we're thinking about the pandemic, but this was not a surprise. It gives me no pleasure to say that, in a previous stint as a healthcare editor, I wrote a cover story 10 years ago predicting the age of pandemics and that we're entering an age. At that time, there had been a virus that was dubbed the Mexican swine flu and it was politically incorrect to call it that, but it was the pandemic that originated It appeared in Mexico City. Thankfully, it petered out. It was not as deadly as COVID, but the alarm bells were wrung.

Vijay Vaitheeswaran (21m 52s):
Lots of virologists and zoonotic experts that I spoke with at the time said, "We have come to a phase in which globalization is connected. In every part of the world, humans are encroaching on wild areas so aggressively." In places like Africa and Asia, where people live very close to their animals, we're seeing a lot of viral mixing between species and crossovers. Every year, I was told two to three potential pandemics emerge of the potential to be the next Spanish flu and we're just getting lucky. We're dodging bullets. It's just a matter of time. Sure enough, it took 10 years to get there, but the world did not prepare. We did not learn the right lessons.

Vijay Vaitheeswaran (22m 32s):
We did not have adequate, scientific, societal, and especially, public health and public education tools in our arsenal to deal with this pandemic. We've not done well, in my opinion. We were rescued by some heroic science. We could talk a little bit about how the transformation of innovation in health sciences actually has led to the mRNA vaccines and other kinds of open-access science that we've got. It's a real fundamental transformation in scientific publishing, scientific approach, scientific inquiry that could have some lessons for clean energy as well in climate, where we could do with a little bit less of the secretive IP-oriented lab, top-secret labs coming up with something with a very financially driven model to one that could be seen as more of a public goods model of innovation.

Vijay Vaitheeswaran (23m 19s):
Perhaps, there's a role for that in some areas of clean energy and climate tech, particularly those that deal with adaptation or technologies that are most suited to emerging economies, where there's not a lot of billion-dollar rents to be made anyway, and there's not adequate innovation going into those areas. We might be able to see new models of innovation. I would argue that would help deal with both energy and poverty, as well as the clean energy transformation, adaptation, and resilience. I think that's an area where we can see a lot more innovation as well.

David Greely (23m 49s):
I'm really glad you brought that up. I was looking at the book you wrote a few years ago, Need, Speed, and Greed on the New Rules of Innovation. I loved the way you defined innovation as fresh thinking that creates something valuable, and really took the emphasis off of the particular invention or the particular process, and on let's just look at these things in a new way and create value. What role do you see these new rules playing in driving the innovation that's needed to meet the big challenge of climate change?

Vijay Vaitheeswaran (24m 28s):
You're absolutely right to pick up on that point about moving away from invention alone, especially with the Silicon Valley model of clean tech invention we talked about a little bit before. It tends to focus on the founder, the cool technology, often its software. That's fine. There's nothing wrong with that. It's suited to lots of things, but a Tik Tok isn't going to solve climate change. We need systems thinking, hard engineering, things that take a decade or more that require maybe multiple skills, not just software. You have to work across silos. You have to think about complicated partnerships and ecosystems transformation. Often, especially when you're selling into the electricity market, you have a commodity product, basically, that's peddled by utilities, that work on a rate of return basis, that are heavily regulated.

Vijay Vaitheeswaran (25m 13s):
They're not favoring innovation. They don't want to take risks on cool new things. They want to keep the lights on. That's how they're rewarded. In the old joke in the utility business, it's the only industry that's compensated for redecorating the chairman's office because it's that rate of return basis. Their incentives are not the same as a lot of other markets. We have to think about innovation differently. The role of government, the role of partnerships, the role of ecosystems thinking is more important than thinking about energy. It's not fundamentally a problem about lack of cool stuff. It's often policies that are in place, legacy incumbents that have strong positions.

Vijay Vaitheeswaran (25m 54s):
In the case of say utilities, some markets that were deregulated in the US we had some problems like with California that did it badly, but you also saw much more innovation and exploration of things like real-time metering, or, let's say, a vehicle to grid, and some of the more advanced concepts coming up in these markets, whereas some of the traditional vertically integrated utilities really don't have a motivation to try new forms of distributed generation, let's say, or to encourage it because they have assets at play. It's a bit of a risk and it's a bit of a bother. Why bother? They might need a nudge. They might need a regulator or some standards, transparency, and disclosure on how they're doing on climate and so on.

Vijay Vaitheeswaran (26m 38s):
I think that innovation works differently because this isn't a real market. People like to think about energy markets, but in fact, it's a heavily ossified, often, heavily and balkanized marketplace with lots of multiple regulators, nimbyism, permitting, and so on. I think that it's the classical simplified model of a free market that doesn't work with energy.

David Greely (27m 1s):
Do you see ways in which government might need to change that environment in order for businesses and companies to be able to innovate the way we need or is that expecting too much from the governments and the regulators?

Vijay Vaitheeswaran (27m 11s):
No, not at all. On the contrary, I think we need to have agility and we're seeing it in different parts of the world in different ways, right? In the case of climate-related kinds of energy markets, we see in Europe lots of interesting experiments with auctions, with government-funded venture capitalists. We see specific kinds of carbon requirements, emission trading, of course, is most robust, and now, there's quite a serious carbon price in Europe, which is having an effect on the marketplace. They're considering carbon border taxes as a way of dealing with the leakage problem. You're seeing, as an example, one part of the world, and even within Europe, there's a lot of variety.

Vijay Vaitheeswaran (27m 53s):
Different countries have different approaches and all of these are good. If you look at Chile, when it comes to encouraging technology of the future, hydrogen as a fuel, as an energy carrier, of course, our listeners are sophisticated. They'll know hydrogen is not an energy source. It has to be made from something, a primary form of energy like electricity as an energy carrier. Chile wants to make that hydrogen of the future from the vast renewable resources they have. Among the world's best and cheapest renewable resources is found in Argentina and Chile, but Chile has both the innovation capacity and the regulatory framework to attract investment. Right next door, Argentina, with almost the same resources, is not getting the same kind of investment so there's a classic case of side-by-side, the role of policy, a framework of ecosystem showing you why innovations happening in one country and not in the other.

David Greely (28m 52s):
Another big nudge that's occurred in the ecosystem recently has been the rise of ESG investing. Bankers, lenders, investors, stakeholders, and employees are really pushing companies to make net-zero commitments and fund the innovation that's going to be required. What's your view on the impact that the ESG movements have so far in driving innovation, as opposed to getting commitments alone made?

Vijay Vaitheeswaran (29m 20s):
I don't think the ESG movement, so far, has had a net positive impact on climate innovation. There are a couple of reasons why. One is definitional. It's not entirely clear that things that are called ESG are actually doing environmental good, and this is willful mischief to some degree, but also, it's a crazy wild west at the moment, where huge amounts of money, the order of trillions of funds, is being shifted over to ESG, but there's no commonly-agreed standard as to what qualifies as environmental, carbon friendly. Or net zero. You're getting a lot of companies that are making statements, hoping to grab some of this ESG money, and they're getting away with it. Also, they're competing indices, whether it's Bloomberg or the FTE.

Vijay Vaitheeswaran (30m 1s):
There are multiple standard providers and they don't agree on the definitions. When you really dig into it, the world's biggest asset owner, of course, Larry Fink, he and his institution are huge in ESG. He's made some very important, powerful comments that have moved the industry towards the embrace of ESG, but a lot of his funds are still invested in oil and gas, for example, which people would query, why is ESG money going into fossil fuels? I think that's a reasonable question. There's a reasonable answer to that too, but that's an example of the confusion, lack of clarity, and lack of agreement there is in this area. Secondly, a lot of the money that's held by, not only BlackRock but Vanguard and some of the fidelity, the other big funds that tend to be transactional, shorter term.

Vijay Vaitheeswaran (30m 48s):
If you're going to really spur climate innovations, climate tech requires long-term capital, patient capital. The sort that Bill Gates is pioneering with some of his investments with other fellow billionaires that have put in money for 10 years and longer into numerous technologies. Direct air capture, for example, is going to take a decade or more before we even know if it works very well and works economically. That's not the kind of money that ESG investors are putting funds into, nor should it be. If we think about it, this is grandma's pension fund, for example, or 401k. Do you really want your beloved relatives' retirement money caught up in extremely high-risk climate tech of the sort? The world needs to bet on it, but it shouldn't be grandma's retirement money.

Vijay Vaitheeswaran (31m 29s):
It should perhaps come from some other kitty. you get my point, right? It may not be suited. It's not the right of risk capital to go into this innovation encouragement. If you look at it from an ecosystem perspective, what you're seeing is that there is a lot more risk capital, angel money, venture capital money, early-stage that's coming into the so called climate tech boom. That's appropriate, meaning these are people who know the risks they're getting into, and they also have longer timeframes now. The difference from last time with clean tech is you're seeing mezzanine financing, you're seeing project financing, and you're seeing the private equity firms coming in in quite a large way. You have all of the big players, really.

Vijay Vaitheeswaran (32m 10s):
TPG, you have Brookfield, you have multiple other ones. John Brown, the former chairman of BP is heading up one of these funds. Mark Carney is setting up one of these funds, the former head of the Bank of England. A lot of poobahs commanding billions upon billions are coming in specifically for clean tech company investments, not generic ESG, buying the index, but specific company investments, but later stage. That's huge because what it does is give those venture capitalists an exit. When you get to series D, series E, there are people that are waiting in line to scale up. When you want to get beyond your pilot plant to scale up to a hundred million dollar project that might be close to commercial size, well, now you can get bank financing from JP Morgan and Citi, which have put specific money into this.

Vijay Vaitheeswaran (33m 2s):
Amazon is an example of their corporate funds as well. Microsoft, Amazon, they're not just putting a greenwashing statements out in their puffy TV ads. They're doing that too, but by putting in billions into these specific climate tech investments, Amazon has made the company Rivian possible, For example, the electric van maker, because they funded them early on when they were just a glint in the eye of the IPO that's happening and people wanting cool electric pickup trucks. They saw delivery vans. This is a company that could deliver, but in addition to seed capital, they also put in an order for a hundred thousand electric vans. There's no venture capitalist on earth that can both give you seed money and guarantee you a market later on.

Vijay Vaitheeswaran (33m 48s):
It's only a company like Amazon. Maybe Alphabet and Google could do that, but in this case, Amazon made that bet in effect creating a market. We're seeing very interesting kinds of changes in how climate tech is financed. That gives me some encouragement as well.

David Greely (34m 9s):
That point of needing to not only funnel investment dollars, but create the market for what's being done differently is so important. One area where that's occurring is with large corporations that, under stakeholder pressure, have moved to make net-zero pledges and then are doing some of it through reduction of their own emissions, but then also, looking for ways that they can participate in a voluntary carbon offset market, where they can basically pay someone else to reduce their own emissions or to invest in new technologies that can take carbon out of the atmosphere and sequester it, whether it's through nature-based projects like reforestation or some of the newer technological projects that we'll likely see which ones work and which ones scale over the next decade or so.

David Greely (34m 58s):
I'm curious. When you look at what's happening in the investment space and some of the development of this nascent carbon market, what do you see and how do you think about that in the context of what you saw 20 years ago?

Vijay Vaitheeswaran (35m 11s):
I'm deeply skeptical, to be honest. I see the intellectual case for why voluntary carbon markets can be helpful and why offsets can be a part of the solution. I don't have a problem with that. What I have the problem with is the actual devil in the details. What you're finding is that a lot of companies are making 2050 commitments to net-zero, carbon neutrality, or net negative in the case of, I think, Microsoft and a couple of other companies claiming that they'll suck down more carbon than they've ever emitted in their entire history. You see these very big boasts and claims. A lot of them are made on a timeline after the current executive team will

have retired and maybe even passed on to another world.

Vijay Vaitheeswaran (35m 52s):
You don't often see a specific roadmap for what will be their capital commitments for the next 5, 10, 15, 20 years, or where you can see those CapEx numbers, which is, of course, disclosed to financial analysts in the annual reports and quarterly reports. You see that they don't actually match up with what is being promised in the next three to five years. If you can't find any significant evidence of a change in capital expenditure patterns, and yet, the company is claiming a massive reduction towards net-zero, then what they're really doing is planning some magical improvements in efficiency and then they're going to buy a bunch of offsets. You say, "Okay, where are you getting these offsets?" The answer becomes very vague. "We have a very trusted and reliable consultant.

Vijay Vaitheeswaran (36m 32s):
They're helping us find nature-based solutions. We have some very interesting projects, renewable energy credits we're investing in." "Really? Okay. Well, tell me about how
long has that tree going to stay in the ground? We have an era of wildfires in many parts of the world. What happens when that project gets burnt down to the ground? Tell me about additionality," a term from the negotiations at the United Nations process. "That little patch of land that you preserve here through your credit, how do I know the patch next door isn't the one that's going to be deforested by the Palm oil plantation? How do we know this is additional to what would have been done? Otherwise, you're not doing the earth any good.

Vijay Vaitheeswaran (37m 13s):
Never mind outright fraud as well, which is rampant in this marketplace, there's no regulation. There's not really very good transparency. Now, increasingly, we are seeing third-party watchdogs, companies using satellite tracking, and better data. I'm hopeful that we'll see some forms of rigor enterFIRM into this space. At the moment, what I'm seeing is the price is extremely low. That's usually an indicator of quality. It's not worth very much. It's basically what the PR value. If you were to see the true cost of removing carbon from the air, look at direct air capture, for example. A company like Microsoft and some of the others that are willing to pay for this are willing to pay a thousand dollars a ton, massive amounts of money to pay down for the technology, to buy down the cost for the rest of us.

Vijay Vaitheeswaran (37m 56s):
Eventually, that may get $200 a ton or they say a hundred dollars a ton, they and their competitors. We know it works. It just is not a scale. It's a very, very slow process of getting to scale. That's different from saying, "This forest will definitely be here for a hundred years and you can take the credit for all of that." "Yes, I got a bridge in Brooklyn I'd like to sell you to."

David Greely (38m 26s):
It really does seem like, on both the governmental side and the market side, there's a large question of will and willpower. Will the governments be willing to ratchet down the emissions reductions that are required to ratchet down the emissions that they can do? As I said, right now, the pledges take you to something like 2.7. Are you even going to keep those pledges? It's a little bit like making a new year's resolution to lose 10 pounds without a plan and with a history of that does not lend credibility to the resolution. I think it's also in the markets where much of what's driven the voluntary market so far has been stakeholder pressure.

David Greely (39m 7s):
Will those stakeholders continue to put pressure on and will they discriminate? Will they look at the difference between a high-quality project that is meaningfully reducing carbon in the atmosphere and price that at a thousand dollars if it needs to be priced at a thousand or a hundred? Will they simply say, "Well, that project is the same as the $1 credit project that really doesn't do anything, but perhaps, embellish someone's public
relations materials? I think we do have that large question of willpower going forward. You brought up earlier the situation in Europe in terms of the spike in energy prices. I guess, is that a warning to us of soon after the energy prices took off, you saw the UK bringing its coal plants back online as an example?

David Greely (40m 1s):
When push comes to shove, it seems maintaining that will power in the face of higher energy prices is going to be a great challenge. I'm curious about your thoughts on how do we navigate this path of removing carbon from the atmosphere, paying for those projects, paying for the new technology is going to be expensive and the world has become accustomed to lower prices, reliable energy. How do you see those tensions being resolved or not?

Vijay Vaitheeswaran (40m 38s):
You're right. This is a huge problem. We saw this with the energy crisis that parts of the world are going through, most notably, Europe at the moment because of that natural gas crunch. That's partly why Britain had to turn back on its coal plants to keep the lights on with that delegates came to Scotland for the COP summit, a great humiliation for a country that's trying to lead the low carbon brigade. We see, in Europe, part of the reason for this concern is granny may freeze this winter because of low natural gas stocks, right? That was a great concern. It created a political crisis.

Vijay Vaitheeswaran (41m 18s):
One bad outcome would be that the tension between keeping the lights on and having reasonable prices for consumers versus stepping on the gas for aggressive push ahead on clean tech and expanding renewables low-carbon technologies, that tension will explode into political tension, and ultimately, a political backlash. It may lead to populism. I think we're already seeing strains of that in some parts of the world. We're seeing that attitude of refusal to accept some of the costs of transition. It's already evident. Some of the ways through the impasse, which is really your question, I think that a more grownup attitude amongst the environmental community and progressives. Acknowledging that you can't see demand a massive expansion of renewables without acknowledging there are intermittency questions that there are questions about the need for baseload and firm power that have to go hand in hand with the dramatic expansion of the grid.

Vijay Vaitheeswaran (42m 8s):
If we're really going to achieve electrification of almost all transport, certainly of personal transport and everything short of long haul, heavy duty transport, which may be served by hydrogen in the long-term, we're going to have to have a much bigger grid, more capable grid, much more renewable energy on the grid or decarbonized energy on the grid. That's going to require a lot of transmission lines and multi-directional flows of power via a grid-ancillary power service, software upgrades, things that we are nowhere
near being ready to do nor having invested in. It's going to require much more advanced forms of energy storage than, at the moment, we think batteries can provide. Now, there are some promising advances in battery technologies. Let's see if companies like Form and others that are making big promises can deliver on what they're promising, but it might require other forms of long-term energy storage, pumped hydro that might require some form of hydrogen storage.

Vijay Vaitheeswaran (43m 1s):
There are other alternatives. Compressed air has been proposed, but we have to think a lot harder about that. Ultimately, you have to think about nuclear and natural gas as being considered as bridging solutions until we get to a point where renewables can be ubiquitous at scale and dominate grids without the intermittency problem. We're not there yet. In Europe, there is a current, very politically charged debate about whether natural gas and nuclear should be considered green in the taxonomy of what's encouraged for investment and is eligible for subsidies and that sort of thing, given the official blessing by the poobahs in charge.

Vijay Vaitheeswaran (43m 43s):
This is vociferously opposed by environmental groups of a certain flavor, but I think this is a mistake if we don't consider natural gas with proper controls on fugitive emissions, right? That is state-of-the-art controls on emissions, combined cycle gas plants. If you use proper controls and modern equipment, which is certainly viable and economic, you find that a switch from coal to gas in the emerging economies will be saving 50% on CO2. That is it's half as carbon-intensive to burn natural gas as it is coal. In many parts of the world, that's a viable option for getting off of coal. Whereas, just saying, "Shut down all your coal plants, India, and just use solar panels." It's not a realistic solution. You're going to end up with no change. Many people are letting the ideal be the enemy of the good, in my opinion.

Vijay Vaitheeswaran (44m 24s):
Similarly, nuclear, I don't think, should deserve any special subsidy. It's an expensive form of boiling water basically, but it's wrong to say that it shouldn't be on the table for countries that want to invest in that. Especially in Eastern Europe, for example, for countries that don't want to be accessibly reliant on Russian gas for geopolitical reasons, to somehow discourage them from looking to nuclear is crazy in my view. I think that those are the grown-up solutions we need to put on the table as we talk about the energy transition.

David Greely (44m 55s):
Certainly, a lot of room for us to come together and acknowledge that there's a need to move to responsible energy, to deal with the impacts of climate change, and a need to, as you've put it, make sure the lights stay on for granny. I'm curious, you're finishing up your third decade at the Economist right now. If you look forward to where you'll be after
another decade, I'm curious just from an imagination perspective, what article would you like to be writing 10 years from now over what may have occurred over the next decade?

Vijay Vaitheeswaran (45m 31s):
I hope a decade from now, I've got my feet up watching a beautiful sunset over the island of Anguilla in the Caribbean after a wonderful day of scuba diving in the wonderful reefs that are nearby. Sadly, I fear that I'll be toiling behind my desk, writing yet another article about energy markets. If in fact, I do get my dream, it will be that rather than having been bleached through the effects of certification, having the fish choked off, or patterns of storm activity destroy the Caribbean islands and other vulnerable areas, that, in fact, our interventions, both at the policy level but also in terms at the individual level, that by getting involved, by making it clear to governments, but also to the companies that rely on us as consumers, that we need to get beyond this tipping point that we're approaching, to accelerate the transition to low carbon energy systems and a way of life that still delivers good things that we all want.

Vijay Vaitheeswaran (46m 29s):
We all want that connection to each other. We all want decent food and decent accommodations, but it doesn't have to be done in the dirty and fossil fuel-intensive ways that had been done in the past thoughtlessly. We'd do it more thoughtfully and we do it now with more ambition. I think we can be well on our way, a decade from now, towards that future.

Announcer (47m 44s):
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