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Financing the Energy Transition | Episode 1

Nat Bullard, Senior Contributor, BloombergNEF and Venture Partner, Voyager Ventures

We kick off our new series, Financing the Energy Transition, with Nat Bullard, Senior Contributor at BloombergNEF and a Venture Partner at Voyager Ventures. Nat writes weekly for Bloomberg Green on energy, transport, technology, climate, and finance. We start our new series by exploring with Nat the size of the investment that's happening in the energy transition, where it's coming from, and where it's going to.

Nat Bullard (01s):

So you're starting to see money kind of capable of carrying something from an idea to hopefully, ideally gigaton scale deployment, moving through steps and moving through phases of capital and various tranches with various risk appetites, with various abilities to de-risk those technologies as time goes on. What I wrote in my piece that I think is important to mention is that if you want to address something as a climate investment, then it needs to, as a first principle, talk about its climate benefit.

Announcer (34s):

Welcome to SmarterMarkets, a weekly podcast featuring the icons and entrepreneurs of technology, commodities, and finance ranting on the inadequacies of our systems and riffing on ideas for how to solve them. Together we examine the questions. Are we facing a crisis of information or a crisis of trust? And will building smarter markets be the antidote?

David Greely (01m):

Welcome to our new series, Financing The Energy Transition on SmarterMarkets. I'm Dave Greely, Chief Economist at Abaxx Technologies. Our guest today is Nathaniel Bullard. Nat is a Senior Contributor to BloombergNEF as well as a Venture Partner at Voyager Ventures. He writes weekly for Bloomberg Green on energy, transport, technology, climate, and finance. We'll start off on a new series by exploring with Nat the size of the investment that's happening in the energy transition, where it's coming from and where it's going to. Hello Nat, welcome to SmarterMarkets.

Nat Bullard (01m 33s):

Dave, a pleasure to be here. Thank you for having me.

David Greely (01m 35s):

Yeah, thank you for leading off our series on financing the energy transition. Over the past couple of years, there have been so many net zero commitments made and there have been so many billions of dollars committed to investing in the energy transition, but it's not always clear how those dollars are connecting through to building the physical infrastructure that will enable the energy transition to a net zero economy. I thought you wrote a really great piece earlier this year at Bloomberg titled Energy Transitions, Big Dollars, Big Themes, and I thought that would be a great place for us to jump off. Can you walk us through some of the financial channels you're seeing by which these big dollars are flowing through the capital markets to help finance the energy transition?

Nat Bullard (02m 16s):

Certainly, so let's start with the scope and scale. So last year and mind you we're recording now in November. So this, these are numbers that are almost 10 months old. Last year was about 750 billion give or take of investment in energy transition. That's in power generation renewables, it's in electrified transport and then it's in a fairly long tail of other things such as hydrogen, heat, some sort of circular economy related investment and even investment we would put nuclear power into that category as well. It's grown significantly over time. When I began doing this, it was more in the range of about \$50 billion and mid-2000s, late 2000s. We're now at about four and a bit trillion dollar that's been invested over the last 15 years or so, and it's becoming a significant number. I think what's important to do is to sort of separate it in a couple of planes.

Nat Bullard (03m 12s):

The first is how much of that money is flowing into renewable power versus everything else? And renewable power has been bouncing around it's below \$400 billion for several years. It has sort of hit a plateau at least in the meantime, not necessarily in a bad way and I'll get to that. Transportation on the other hand is approaching \$300 billion a year and that's almost entirely electric vehicles. There's also a small component underneath that of just energy storage in general and then all of the rest of that stuff is sort of more in the range of about a \$100 billion total. So it's not an insignificant number, but all of it needs to grow really substantially if you were wanting to do a really deep decarbonization. So sort of move from, think of it as a energy transition set of strategies in companies and towards real decarbonization of the global economy, you probably want to triple or probably quadruple rather than top line of all of those things.

Nat Bullard (04m 08s):

So you're gonna need like 2.7 times more renewables, like three and a bit more times more transport, and you're gonna need almost 10 times more of everything else in the stuff that is historically been very difficult to do for technical reasons, to really decarbonize things like steel production, cement production, the electrification of heat, things of that nature. So that's sort of the, the, where the numbers go. Where it comes from I think is also worth looking at because you definitely see a lot of attention to the sort of the early stage elements of, of capital raising. So that's like climate technology at the venture stage and private equity is about 50 billion a year. You look at the activity in specs, pipe deals and IPOs, and that's the year, which is fairly active market, but \$110 billion. There's obviously equity at the company level that flows into most of what's happening in in any of these different sectors. But two things are important to note. One is that almost all of the money actually finances assets with financing physical build of something and two, most of that follows a fairly established project finance modality. So you've got a component of equity, you've got a much larger component of debt, and that's generally the way that long dated assets with fixed contracts get built. So hopefully that sketches that a little bit about sort of like, like where it goes, but also how it goes in terms of flows into energy transition and decarbonization.

David Greely (05m 32s):

Absolutely and you mentioned renewables is kind of one of the sectors that was receiving the most investment dollars. What are some of the other sectors where the money's going and in particular, how much does scale matter. You mentioned that there's money flowing into some of the early stage startups, but I imagine a lot of it's going into like the, the large scale deployments of solar wind?

Nat Bullard (05m 54s):

That's exactly most of the money that we see flowing. I want to say that it's roughly about like \$9 out of every \$10 really in the investment realm for these assets is going towards building something, it's going towards actually creating an asset that goes into the ground. That's where most of the capital flows and of that about half of it in total is going towards just renewable power generation and within that, almost all of it is going really to wind and solar. So we've got a sort of continually narrowing funnel in terms of where money is typically going. What's interesting about that is, you know, I mentioned that figures kind of like tapping out and it's actually not necessarily a bad thing in the long run. You want that number to be probably in the order of more than a trillion dollars a year and the declines that we've seen have been this sort of combination, this triangulation of both the falling capital cost of assets and money deployed. So you're getting more out of every dollar that is being deployed, which means that even if you have sort of relatively flat or not hugely growing dollars in terms of deployment the dollars invested rather, you're seeing more assets deployed for that same money.

David Greely (07m 07s):

And I'm curious, have you seen this pattern of, of sectoral investment changing in recent years?

Nat Bullard (07m 14s):

It's, yes.

David Greely (07m 17s):

And you look at a lot of technologies and I'm curious if you see certain sectors that you would say are being underinvested in.

Nat Bullard (07m 21s):

So transport and remember, we include vehicles as a sort of quasi fixed asset in this case they're at least longer dated than consumer packaged goods or white goods even. It's really transport where things are taking off and I remember a couple of years ago I said, I want transport team at B & EF and we tried to sort of game out at what point we would have more dollars invested in transportation than invested in clean energy and it's fairly elastic depending upon the demand for, for electric vehicles, but we're probably not far off

in a year or two, maybe three before most of the dollars that are flowing are going into EVs and some of the related energy storage investment that goes with it. As far as where we're probably not devoting enough, I think the early stage of things that were really considered kind of science experiment or maybe science fiction level decarbonization approaches is where we definitely need to see more money if we want to see a lot of activity.

Nat Bullard (08m 20s):

And that's in what in the parlance you would call hard to abate sectors. So that's things like cement production chemicals, steel, aluminum production, places where you start to run into chemistry problems and not just physics problems, so to speak, where you actually have molecular balances that you have to maintain, where you have extremely high needs for heat and very high needs for the quality of that heat, things like that. There's another area, and this is becoming very apparent right now in Europe in the current series of crises kicked off by Russia's invasion of Ukraine, which is in heat of all sorts as something that needs to be decarbonized and some of it is as prosaic is just replacing the home boiler with a heat pump. Other elements of it are going much further into industrial heat production, which I think most of your listeners will be aware is an extremely big proportion of global energy demand, but it's also a very demanding portion of demand, so to speak, like you need to hit certain qualities of heat for certain durations with certain stability in ways that really cannot be converted into intermittency or variability. And so I think that that's where structurally, I wouldn't say that we're necessarily fundamentally underinvested because this is really quite new, but we are definitely in need of much more investment to come.

David Greely (09m 47s):

And you wrote a really interesting article for Bloomberg last week, I believe, where you discussed the rapid development of climate capital at all scales from early stage venture to multi-billion dollar infrastructure and the funding available for climate tech and climate oriented businesses and projects. How are you seeing climate focused investing evolving and connecting with and funding these climate oriented businesses?

Nat Bullard (10m 12s):

It's a really good question, right. It's sort of a, it, it's kind of like a running, a running theme for anybody investing in climate specifically is to look at something, a portfolio and asset, a company business model and ask, is this a climate investment or not. It's fact a little bit of a running joke that we have with some of the people that I talk to frequently and I thought that it needed a bit of specification but it didn't need to necessarily be narrowed down. So the venture landscape is very healthy. I think we would say it is still very healthy in terms of active fundraising. There's a great deal of inbound interest from founders and there's a lot of LP interest, which is obviously where you want to be if you're on the front and sharp end of things, there's plenty of interest in in creating new technologies addressing these challenging questions.

Nat Bullard (11m 04s):

And then what's really important is that we're starting to see the money that gets laddered on top of that to step these assets from sort of experiment lab bench to fab to massive deployments. So you see things such as Brookfield or Copenhagen Infrastructure Partners launching what they would call an energy transition fund and you can think of as like the deployment capital for the long run of building assets that one way or another are gonna decarbonize, you've got interest from sovereign funds to, Masek in particular has a big play here in addressing not just challenges around infrastructure, but even increasingly challenges around things such as recycling or even trying to decarbonize or demethanizer rather the production of rice, which is both a huge source of emissions and a huge source of calories in particular in Southeast Asia. And then you've got things such as the loan programs office at the Department of Energy here, which has been, how should we say, revived, you know, at scale thanks to both the activities of it of its director, but also the new funding that has come from the Inflation reduction Act.

Nat Bullard (12m 14s):

So you're starting to see money kind of capable of carrying something from an idea to hopefully, ideally Gigaton Scale deployment, moving through steps and moving through phases of capital in various tranches with various risk appetites with various abilities to de-risk those technologies as time goes on. What I wrote in my piece that I think is important to mention is that if you want to address something as a climate investment, then it needs to, as a first principle talk about its climate benefit and that probably is in the range of what emissions is it avoiding, what process is it improving to what degree that we can measure in a climate way, and what kind of scale does it hope to achieve. So I think that that's a very important thing to put in because otherwise we have the potential for a sort of looseness in defining whether or not something counts as climate because if it in any way has something to do with emissions, you could consider it to be a climate investment. I think that if we're going to call all these new pools of capital when their investment

approach is a climate investment approach, then it needs to very specifically address that element of what those companies intend to do.

David Greely (13m 29s):

And how much of is there the overlap between what you would call climate and what people would look at as a carbon project. And one of the things with carbon projects, of course, is that it's measurable and so sometimes it's easier to measure the benefits relative to other climate type benefits.

Nat Bullard (13m 48s):

So you're talking here about say a carbon removal project like direct air capture or something like that or okay. So there's definitely a series of different things that we can talk about for reducing carbon, right, one is probably the simplest to measure is also one of the hardest to do, which is build a system, a physical system that withdraws atmospheric carbon dioxide and one form or another secures it on a ideally multi century timeline so that it no longer enters the atmospheric carbon cycle. As I say, relatively easy to measure, very hard to do and if it can be done, it's generally quite expensive. Then there would be something like, let's say using a natural carbon sink such as afforestation or reforestation, wherein you can measure the uptake of carbon into the living things, into wood biomass and with some assumptions, you know, make the case that it's absorbed this much carbon.

Nat Bullard (14m 46s):

Now that unfortunately can be very highly contingent upon things outside the developer's control, such as say a drought and a wildfire that causes that ostensibly sunk carbon to literally go back up and smoke and then there is probably the next phase is looking at what in the UN language they would've called additionality more or less, which is, if I am building an offshore wind farm in the North Sea, what is the counterfactual to that, what would've happened otherwise to create that same 200 gigawatt hours of power per year and you would probably look at what the grid is and sort of assess it as a delta based on that. So the grid is a small percentage, coal, it's a lot of nuclear and a lot of natural gas and a lot of renewables. So you would basically be, you're evaluating it based on what otherwise would've happened in this counterfactual fashion.

David Greely (15m 43s):

Right and you mentioned earlier that there's still a lot of interest, still a lot of money available even at the, you know, the, the venture moving from the, the lab bench to, you know, scaling up the fabrication stage. Are there certain areas that are more attractive to investors right now, whether it's, you know, doing things that are more nature based, as you said, doing things that are more technologically based, even going outside carbon to nuclear or like what are the, what are the areas that are attracting interest amongst investors?

Nat Bullard (16m 16s):

So in early stage, I think there is inherently an interest towards things that can, that can grow and scale very quickly. So there's interest in process improvements, a lot of interest in software where, where it has a direct impact on, on operating systems. There's also interest frankly, in software as software. So things such as accounting or management of flows and carbon flows and things like that. So that's definitely, I think within the realm of traditional venture scaling up a bit, there's a lot of interest in, call it the relatively light infrastructure, the endpoint infrastructure of advanced transportation and of energy storage wherein there's again, a play that has a kind of technological basis to it or a specific business model approach. It is interesting that we see quite a lot of funding interest at the institutional level now for things such as, such as nuclear, we I think do not see enough interest because it's highly contingent on policy and regulation and planning and permission in things such as transmission in things such as, you know, building this sort of connective network that will bring all of this new capacity to the market.

Nat Bullard (17m 27s):

I think another area that, that, that is, is attracting interest and I think needs to attract a lot more is where we think about the intersection of climate and food and agriculture. I mean this is is a part of the global emissions pie that is very, very hard to address. It's very highly distributed, that data are not necessarily great. It is mission critical to get it right to make sure that things are edible and sustainable and so we're beginning to see a lot of interest there, but I think it's still fairly nascent. You could make the argument that some of the synthetic protein in the meats up where the meats substitute foods that we've seen are in one way or another is something climate related because they're very directly avoiding, like for like, the emissions that would come from a similar quantum of ground beef or of ground pork. But there's a lot more to do and many more things to address.

David Greely (18m 24s):

And I'd like to move up from the venture to the, the more institutional managers that you mentioned. Obviously the mainstreaming of ESG has been a huge thing over the recent years, but then recently, you know, we've seen climate activists protesting at Blackrock while at the same time the state of Texas is having its pension funds divest their investments with Blackrock because of its ESG stance. So kind of getting it from both sides there, how do you see this sort of activism from either side impacting investment in the energy transition and I guess more specifically on balance, is ESG increasing or constraining investment at this point?

Nat Bullard (19m 03s):

No, I think this is, this is a really important thing for us to query a little bit and I always start by saying that like if we were to build brand new risk screens today, would we, knowing what we know and with the data we have available, would we somehow group environmental things that are inherently measurable with social things that are harder to measure and maybe not necessarily as related with governance, which in a sense is probably and should be just a component of all good corporate operations and the answer is I don't think that we necessarily would, I think we would probably be atomizing these into separate groups. It's very complex, I think, to try to analyze all of these things together and I think it also leaves, it leaves good, it leaves very clear and apparent climate related risk screening one way or another, grouped in with stuff that can become quite a bit of a political football.

Nat Bullard (20m 01s):

And that I think is where you find institutional fund managers in this challenging position of they could be setting up in one, in one element a very rigorously defined asset and infrastructure investment thesis that in a sense doesn't really need ESG within it to exist at all. It's simply going to have risk adjusted returns above whatever baseline they're assuming and it happens to be invested in things that are largely decarbonization related versus all the other activity that it might be measuring that is far more social, that is far more contentious, certainly I think publicly and I think that it, it would benefit in a way to sort of have these atomized again so that this is a fund that doesn't, it isn't predicated upon ESG, it's simply predicated upon risk adjusted, you know, risk adjusted returns above your benchmark that happen to be best met from doing these kinds of activities that happen to be decarbonization related.

Nat Bullard (21m 03s):

Now is it, is it actually impairing capital flow? I don't think so yet because you simply have a lot of institutional investors further up the ladder. You have the limited partners of a lot of these institutions or you have pensions themselves that have their own mandates that simply see this as doing good business for themselves and are willing to sort of ride through it. I think what's going to be really important for us to watch is what the portfolio performance impact is of making these large divestments at the moment. You know, if you think of it Blackrock has an ESG fund if you want to buy it. They also have funds that are things such as, you know, basically the shale patch and you can invest in those as you like and, and see your return or your particular stance reflected in that decision. So I don't think that it's materially impacting inflows yet, but it is complicating the thought process for sure and it's injecting political complication in a way that I can't imagine most big investment managers are interested in having to entertain.

David Greely (22m 17s):

Right and I'd like to switch over there from talking about investment policy to government policy, which you've brought up a couple of times now because of course there's a lot of government influence in financing the energy transition as well and I'm curious, how big of a role do you think that's playing right now and you know, with the passage of the US Inflation Reduction Act, what do you think that's gonna do for climate investment?

Nat Bullard (22m 40s):

So one thing that I like to emphasize is that there is really not such a thing as a completely free market in energy anywhere. It is simply neutral statement too large, too embedded, and too strategic in any economy for it to be left purely to market forces. You know, whether that's the Texas Railroad Commission back in the day determining how much oil could be sent so that you don't have price wars forever or it's a public utility commission regulating rates of return or setting rules for interconnection or making determinations on the proper mix and an integrated resource plan. We have always had a strong hand of policy and regulation in markets. I think that that's just a feature of them rather than a bug. That said, I think that we are entering a period of a much more muscular approach at the highest level of policy for a number of reasons in markets.

Nat Bullard (23m 41s):

And one is that the strategic element of this is just brought much more to the fore by what is happening in Europe you know, certainly decisions that were made by the way themselves generally out of some kind of notion of national security, Germany importing gas

from Russia to sort of ensure that there would be peace between parties is now I think being inverted quite a bit to having to meet demand as insofar as possible without disrupting regular everyday life and industrial business, while also trying to decarbonize and while also trying to minimize importation is just a case where governments have to come roaring back into play and I think it's also a place where I don't know that we would expect a private market to ever fully embody all of the things that need doing because they exist at a level sort of beyond the ring fence of how a board of directors is going to make its own decisions.

Nat Bullard (24m 45s):

So, you know, you can talk about policies to sort of set emissions targets in Europe that was the fit for 55 in the EU, that was passed a little while ago. You then have more near term things that just policies to sort of flood the zone with heat pumps so that you aren't relying on gas heating at home and you can save whatever gas is available for industry until you decarbonize that and then in the United States we have things like not just the Inflation Reduction Act, but the Chips and Science Act that are industrial policy and decarbonization policy and economic redistribution to some extent, and jobs policy all wrapped into one in a complex way. But I think generally speaking in an accretive and in a sensible way too with a lot of implementation to come with a lot of devils in a lot of details let's say.

David Greely (25m 38s):

And do you see the, the inflation reduction act in the US as being a, a game changer or at least a strong accelerator?

Nat Bullard (25m 45s):

Let's see. I think that by hopefully spurring on a great deal of infrastructure build, and this is mostly in the form of transmission, it allows what developers of assets want to do to happen. It gives them the sort of way to work to fruition. There is just an insane amount of clean power planned in the national interconnection queues like in excess of 600 gigawatts, which is about half as much capacity again, as exists in all of the US right now of everything, most of which will never get built unless you find ways to connect it. So that I think is one way of changing the game. The other is somewhat a bit animal spirits, and I'm sure you've already noticed this, which is that the passage of the IRA has kind of given license to expand to companies that might previously have been in a wait and see mode for elements of the US market.

Nat Bullard (26m 41s):

So that's definitely the case for battery manufacturing expansion in the US relatedly auto electric vehicle auto manufacturing in the US but also things that are, that are in that, in those difficult and harder to abate parts of the world. Things where you're dealing in the world of chemistry more than you are dealing in the world of electrons and so I think it is, it has sort of widened what we would call, you know, back in the day, the Overton window of like what's sort of, you know, what's sort of acceptable to be viewed and approached and it has widened the lens on what is possible. So I do think, I do think that it is already changing the game, but implementation of this is going to be extremely important. Like if funds don't flow efficiently, if there's a great deal of sort of capture by one group or another that is a sort of unintended consequence of who lobbies best. I think that would be a little bit unfortunate. But I definitely think that it has changed the engagement and change the sense of scale of what's going to be possible, certainly from an emissions perspective, if in that, you know, if do all the things that are allowed through the inflation reduction act, we'll find ourselves not quite on target for where our Paris agreements, but definitely much closer than we would be otherwise.

David Greely (27m 59s):

All right and when we look outside the US and you had mentioned, you know, we talked a little bit about Europe and certainly European energy policies come under a lot of scrutiny recently for its contribution to the current energy crisis there. Even a story of a, a wind farm being dismantled in Germany to make room for a coal mine expansion, you know, not a good look and not the direction for the energy transition, certainly not a good symbolic news story to have out there. I'm curious maybe outside the US outside of Europe, what do you see as the state of climate policy and are there some success stories happening out there?

Nat Bullard (28m 35s):

So I think that, you know, you know, China's policy is so generous. It is, it is hard to separate from the larger economic goals of the five year plan or whatever the, government's own larger goals for not just infrastructure, but technology deployment are definitely, it's sort of an extraordinary success in terms of what it's been able to deploy in its own. I think India has done very well. It's probably going to miss its nearest term targets for renewable deployment, but will move ahead further. A very interested to see what India commits to at the upcoming COP 27 in Egypt because it was sort of the, it was one of the last holdouts to avoid making an emissions peak or a net zero target commitment for I think a defensible reasons of its own development, but I'm curious to see how that plays in particular, the

spike in commodity prices has the knock on effect of making renewable power in particular more in the money, even if its own costs are going up.

Nat Bullard (29m 37s):

Just something we observed over the summer when, when, when, BEN NASA ran the research, which was that, you know, you saw upticks thanks to cost of capital and cost of capital equipment for wind and solar at about a global benchmark level when we did this assessment in, in the summer, but at the same time, rising cost of gas and the rising cost of coal meant that the delta, the positive delta for renewables was never wider against gas in particular than over the course of the summer. It's given, I think it's given a lot more room for deployment of zero marginal cost, zero fuel power generation in particular to kind of come in and occupy a bigger and bigger chunk of global power demand on an economic basis, not so much a policy basis, So that's something that I think we, we're observing closely.

Nat Bullard (30m 32s):

I think transportation too is very interesting though in ways that that, that are hard to see sitting where we are. So there's going to be a little under 2 million barrels a day of displaced oil demand thanks to EVs in 2022. More than half of that is coming from two and three wheeled vehicles in Asia. So it's not coming from buses or trucks or, or Teslas or ID 4s. It's coming from little things that honestly we can't even really buy here if we want to and I think of this as sort of like a bit of a sleeper for most people who look at these markets in the sense that I'm trying to imagine what today's oil market would be like if we had to meet another almost 2 million barrels per day of oil demand in the current market as it is.

Nat Bullard (31m 21s):

And I think that we're approaching moments and I'm channeling a bit with the IEA wrote the other day last week rather, which is that we're kind of beginning to dance around the peak for demand for a number of inputs. In fact, pretty much all of them to industrial economy that needs hydrocarbons, oil, coal, and natural gas. The IEA has called last week in its conservative scenario for what I think they called a definitive peak in fossil fuel demand, which is pretty important when you consider that this is not coming from its ultra, it's ultra decarbonization scenario or even its countries are gonna do what they say they're going to do, announce the pledges scenario. This is in a sort of closest as we can get to business as usual. No major technological changes. The major policy changes simply, we're probably at the moment where we're close to the peak and we're at the peak, rather in emissions from the power sector, we're going to approach peak demand for coal and for oil, natural gas as well though that is expected in their scenario to probably hit a plateau and stay there.

Nat Bullard (32m 37s):

But this is very significant I think, and in particular coming from the IEA, which, you know, if we think about it from its charter, was simply designed to sort of maintain the mechanics of energy security largely in the rich world in the OECD.

David Greely (32m 53s):

Yeah, I'm glad you brought that up because you know, when you look out at the news flow right now, you know, the IEA with their world energy outlook certainly struck a more positive outlook, particularly if you look out five, 10 years down the road. Of course at the same time, you know, they pointed out that in 2021, I think we added 1.9 billion tons of CO2 emissions to the annual total, bringing it up to 36 some. So, you know, on the one hand coming out of the pandemic, we've had the largest annual increase in CO2 emissions. You know, a lot of moving back to coal fire generation in Europe this year and globally but you know, as you said, looking, you know, if government policy makers can keep to their path something like a plateau and fossil fuel use five, 10 years out. So you have the IEA striking a more positive outlook. You've got the UN climate Office came out with, I think what you'd say is a fairly bleak new reporting stating that the world is

Nat Bullard (33m 49s):

That's generous. I think it was more, it was extremely bleak in the way that it was, it was arranged and presented

David Greely (33m 56s):

Yeah. So I wanted to ask you about that because the UN is saying we're nowhere near hitting its our Paris agreement climate targets and so when you're looking at, you know, all these different views from, you know, big world organizations, maybe like taking a step back, how are you assessing the state of the energy transition right now in terms of the scale of the new low carbon energy supply that we're bringing online?

Nat Bullard (34m 20s):

You're right that this is, this is sort of like oddly complex that depending, you know, on what set of glasses you put on, you either see an extraordinary amount of progress, an amazing plateau that I nobody was expecting a few years ago, especially not to be compounded by the IEA or a dismal state in which we're not doing anything right. So I'll work backwards from the dismal one. This is entirely true that we are not on track from the many different measures that you could use specific to each sector to reach 1.5 degree scenario like this is, and now at the point where you need, how shall I say, almost like economic collapse level of typical decarbonization to happen year on year on year in order for that to happen in a near term. So if even COVID 19 in 2020 didn't drive emissions down that much, then it's an awful not to ask of the technologies and the capital suite that we have available today to do so.

Nat Bullard (35m 22s):

So that's the one thing. But the other is that the scale of change that we're approaching right now is something that I think people don't often apprehend in particular because we're at that point where all of this activity that's happening in decarbonization has simply bent somewhat invisibly the increasing curve that has been existing to date, world's gonna have, and this is the IEA numbers here, around 460 terawatt hours of new solar and wind generation this year. This is part of why they said that, well, what I think a mission is about 1.9 billion tons in the last year. They're only gonna be of about 300 million this year, but that 460 or so terawatt hours is the same amount of power as France consumes in a year and France is the 10th biggest power economy in the world.

Nat Bullard (36m 13s):

Next year if you factor in the installation of 251 gigawatts of solar PV this year, plus about 93 gigawatts of wind power plus about 13 gigawatts of offshore wind power, it's closer like 650 gigawatt hours or terawatt hours rather, that's going to be going to be added incrementally to the power system next year. That's more than Brazil, which is the sixth largest power economy in the world consumes. We are to the point where the incremental year on year are now more than 1% of global power demand that is being decarbonized and it's really important because at a certain point, those rates of increase, if they're not matched by a subsequent top line rate of increase, mean that you have to start eroding a market somewhere else for something and so you're going to, you're gonna hit these, not only hit the peaks, but you're gonna have very stiff competition for each of these resources on its own that has peaked for the, the declining share of the fossil fuel margin of generation in any given system.

Nat Bullard (37m 23s):

Are we there yet for oil, very hard to say, but again, you know, we'll be able to calculate by the end of this year what 2023s demand displacement in oil is from electric vehicles and again, it's a number where the top line is still growing and it's simply reducing the rate of growth makes it hard to see, but when it tips things into actual system change, I think it's going to become very dramatic. So I'm not as negative as the UN report is though, I understand the purpose that it's trying to meet, which is that we have set ourselves this goal in this target and we are nowhere close to meeting it. That's true. What I tend to spend my time looking at is like what are we doing and how might we expect that to go forward in the future?

Nat Bullard (38m 15s):

You know, like how can we watch the fact that we're gonna be in a couple of years 15% renewable power globally, which means that that's more than, I think that's probably more than any given country besides China and it's in its share of global power generation and how are we going to match the fact that you know, that growth without the same top line growth and power means that it's got to erode demand for something else with another possibility, which is that if we want to really decarbonize, we probably need to more on us triple the amount of power generated globally by the minimum of the century. That means you could either build more coal and use it to energize your electric vehicle or you can build just orders of magnitude, more of the things that are already on the way to decarbonizing power and working their way into all those sectors that have been hard to do in the past for all the reasons we've already discussed.

David Greely (39m 11s):

Right and it's a bit of, you know, we are getting towards, you know, potentially net zero growth, but we need to get to net zero levels and that's a big test.

Nat Bullard (39m 21s):

Exactly, but I think it's really important, you know, if you, if you think about industries as growth and how they're valued and how capital planning goes to consider the implications of that. If you make varying law if you're gonna make a deep water offshore final

investment decision for oil, what is it predicated on is it predicated on rising demand on that resource being the cheapest barrel on the margin in the market. Is it predicated upon other sets of things we could layer in there, is it more secure, more ethical, which is an argument that we've seen made and I don't actually fundamentally have a problem with that. Is it more secure as supply, is it a diversifying one's global supply or is it consolidating among friends, so to speak, but it all requires if the market is not growing a much more enhanced focus on any one of those particular aspects in a way that when demand was growing more than a million barrels a day, fine, you, it's not really a concern.

Nat Bullard (40m 26s):

You're planning an asset into a growth cycle that you anticipate will continue to pay literal and figurative dividends for a very long time. When that's not the case, then we have you know, a cram down essentially in terms of the economics of operation. We see that in periods of relatively smack demand and how challenging it is for much of the high cost production as some of it gets curtailed as rarely I get, suppose it gets shut in, but you're gonna face that possibility becoming more, more acute every year and I think that's going to be very challenging for any number of different reasons. How do you plan your new assets, how do you run the ones that you have, what do you run them for, do you run them for growth you know, do you run them for cash all these sorts of things.

David Greely (41m 17s):

And I think I'd like to, you know, close this out today by getting your thoughts on, you know, in the spirit of moving forward and this is a process and you know, there are some important notable gains that are being made. What are we doing well right now in terms of financing the energy transition and getting those projects in place that'll help us get to net zero and what do you think we can be doing better?

Nat Bullard (41m 40s):

So what are we doing well, we are doing well at giving money to stuff that works. sounds like a bit of a circular argument and in fact it is a bit of circular logic. Why are these things receiving money because they're bankable. Why are they bankable? Because they generally receive money. So that's one thing we do well is we, I think have a very good sense of following a trend once it has sort of reached an established point. People buy EVs because they're past, you know, they're now past 10% of global new auto sales and they've been sort of de-risked collectively in people's mind. Not that there aren't risks, not that there won't be complications, but people have sort of collectively made the decision that this is a path we're gonna go down, whether it's from the personal buying decision to the capital equipment and tooling decision for the automakers themselves.

Nat Bullard (42m 31s):

In power you know, renewables tend to be the cheapest in most new grids. They also deploy quickly, they deploy relatively smaller if they want tranches of capital deployed. So that I think has a way of, of sort of maintaining its own gravity while also offering the chance for acceleration. I think what can we do better. So one of them is, one thing is to just really be dedicated to solving hard problems. So that's looking past cycles and into the sort of imperative of deeply decarbonizing steel aluminum cement production. These things on their own are like large country size greenhouse gas emitters. They're relatively concentrated. The companies that that operate them are generally very big. They have interest within both their financial and their social license to operate to decarbonize, but they're going to need help, they're gonna need government commitment, they're gonna need R&D.

Nat Bullard (43m 28s):

And then the final thing, and I'm drawing on some very good research that I would urge any listener to find, which is from the Oxford Institute for New Economic thinking and it was an examination of basically 50 years' worth of experienced curves for technologies like wind solarium ion batteries and hydrogen electrolyzes matched up against the assessment models that the large canonical institutions, governments, and for the most part oil majors have done in forecast in the future and this research does an extremely nice job of kind of squaring a circle for me, which is that historically all models tend to assume that like the present can't go on forever. The current conditions of growth or wherever we are reliable but not indefinite and we should probably apply some kind of floor cost to assets on the unit basis and a sort of ceiling on deployment based on whatever Gim Crackery you have in the model that says, Well, there's no way we're going to be able to deploy this much of that. So let's just assume.

Nat Bullard (44m 52s):

Let just assume it flattens out. So Oxford went through this research and, and they attacked the first part the four cost first, which is with five decades worth of analysis, there's no evidence for four costs. This is now peer reviewed research, like we do not see evidence for four costs for these distributed technologies and we will not apply them. So that in and of itself is big. Now, it, it's a bit bonkers if

you're used to sort of assuming that things eventually have to hit a hit, hit some layer at which they no longer get cheaper, and mind you, they will probably have an ATO approach to that point. So, you know, the rate at which they're getting cheaper definitely slows down but the research would suggest that we shouldn't, we shouldn't arbitrarily say that's it, like it's not gonna get any cheaper than where we are right now.

Nat Bullard (45m 54s):

And they also basically sort of urge us to not sort of artificially constrain what the market could be. So, as I said, 251 Gigawatts of solar this year is much more than has ever been built of any one technology in a year, ever for power generation and it's also nowhere close to actually what the market itself is planning to do. So it's sort of a matter of where we look. If we look at poly silicon production, which is kind of the rate determining production element for making solar panels by 2025, we'll have somewhere north of 900 Gigawatts worth of annual production capacity available. So the market companies are already planning to do that. They're planning to be capable of meeting that, and you sort of have to suspend disbelief a little bit if you want to follow what otherwise, I think is a pretty evidentiary and logical chain of events to get us to a future where we can be doing double or triple the amount of somewhere that we're doing right now.

Nat Bullard (46m 38s):

Because to an extent companies have willed that into being provided there's capital notable, provided the, the rest of the economy is stable enough for things to deploy. Provided you have all of these other assisting or determining steps such as transmission and planning and permission and trade and everything in place, then this is definitely within the realm of possible and finding an arbitrary reason to shut it down has sort of been viewed almost as like a good practice back in the day is a way of not sounding like you were completely nuts, but I would urge us not to preemptively apply such things because these markets have traditionally blown right past them with sort of no disregard for what the integrated assessment model says and companies themselves are in their own interest to expand as much as possible, try to grab market share, and allow us this ability to sort of really move down the curve, you know, in three, you know, two, three, 4% per year decarbonization of the global power system.

David Greely: Thanks again to Nat Bullard, Senior Contributor to BloombergNEF and Venture Partner at Voyager Ventures. We hope you enjoyed the episode. Join us next week when our series continues with guest Nikita Singhal, co-head of Sustainable Investment and ESG at Lazard Asset Management.

Announcer (48m 02s):

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Announcer (48m 42s):

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