

Renewable Energy for the Future: Managing Through Challenging Times

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Jessica Bradford: Ladies and gentlemen, I'd like to welcome you to today's webinar, Renewable Energy for the Future: Managing Through Challenging Times.

Before we get started, I'd like to mention that today's session is being recorded, and you are currently in a listen-only mode. The ON24 room that you are logged into today allows you to individually adjust and resize all available panels that appear on your screen. To resize any of the console panels, simply click on the lower right corner of that panel to adjust. And you can move panels to your preference by clicking anywhere in the top title bar of that panel and dragging to your desired location within the console. We will have a question-and-answer session at the end of today's presentation, and you may type in your questions at any time on the left-hand side of the screen in the Q&A panel. So type your questions into the lower text box and then click on the submit button to get your questions into the queue. Finally, if you experience any technical difficulties during today's webinar, first refresh your browser to reset your connection. You can also enter a question into the Q&A panel stating your technical issue and we would be more than happy to assist you.

At this time, let's begin today's webinar, Renewable Energy for the Future: Managing Through Challenging Times. It is my pleasure to introduce your moderator for today, John Eliason, Partner and Co-Chair of the Energy Industry Team, Foley & Lardner LLP. John, you have the floor.

John Eliason: Great. Thank you. And welcome, everyone, and thank you for joining today's discussion with us. We're going to be talking about the renewable energy outlook going into the last few months of the year and then talk a little bit about the various disruptions the industry has endured and what we're expecting looking forward. My friend, Doug Lavelle with Wilmington Trust will be monitoring your questions and sorting them for us. We're in good hands. Doug's the Managing Director and Head of Business Development for Project Finance. Our goal is to make this webinar useful to you, so please contribute questions so that we don't overlook things that are important to you.

Okay. Before we get started, I'd like to introduce you to our great group of panelists. We have Eric Heintz, Director of Energy Finance at M&T Bank. Eric, can you take a minute and describe your role in the organization?

Eric Heintz: Thanks, John, and thanks for everyone who's joined us here on the webinar and my fellow panelists as well. As John mentioned, I'm Director of Energy Finance. I'm

responsible for the bank's renewable energy investment platform. We primarily invest in solar, both utility scale as well as distributed generation solar. We invest on a tax equity basis as well as on a sale and leaseback basis. We're thrilled that folks have joined us today. Thank you very much.

John Eliason: Great. Thanks, Eric. We also have Thomas de Swardt, Executive Director of M&A and Finance at D.E. Shaw. Tom, can you take a minute?

Thomas de Swardt: Sure. Thanks, John, and thanks to M&T and Wilmington for putting this together. It's great to be here. As John said, I'm Tom de Swardt. I am an Executive Director at D.E. Shaw Renewable Investments, or DESRI. We are a sponsor and developer of renewable energy projects, both wind and solar, in the United States. We have about 40 projects, a little bit more in construction or operation across North America. My role is on the transactional side. I lead a lot of our M&A, finance, tax equity deal flow. And I'm happy to be here. Thanks again.

John Eliason: Great. Thanks, Tom. We have Will Marder, Managing Director and Head of Project Finance Agency Services at Wilmington Trust. Will, what's your role at Wilmington Trust?

Will Marder: Yes. Thanks, John. Thanks to everyone for joining us today on the webinar. So my role here at Wilmington Trust is to head up the Project Finance Agency Services team. We've got a great team overseeing a large portfolio of transactions in the energy and infrastructure sectors. We are an independent third party provider of trust in agency. So the Wilmington Trust side, we're not a lender or an investor. We really just come into these transactions in roles like administrative agent, collateral agent, depositary and so on. And we've seen a lot of activity in the renewable space. So really looking forward to talking about it this afternoon.

John Eliason: Great. Thanks. And then last but not least, we have Dr. Tom Rowland-Rees, Head of North America Research at BloombergNEF. Tom will be starting us off by providing a presentation in the renewables market. Tom, I'll ask you to please describe your role at Bloomberg and then jump into your presentation.

Tom Rowland-Rees: Thanks, John, and it's a real pleasure to be here. So as John mentioned, I'm the Head of North American Research at Bloomberg New Energy Finance. We're a -- for those of you not familiar with us, we're an independent provider of market research on clean energy and the energy transition. That includes wind and solar. But we also look at power markets, electric vehicles and adjacent areas such as sustainability and advanced materials.

To start off, I'll first of all mention what I was doing just before this, because the role that I'm in as Head of North American Research I've only been doing since March. And prior to that I was Head of Research for Europe, the Middle East and Africa. In fact, because of the COVID crisis, I haven't even made it over to the US yet. So I'm still in London, but I'm focused on North America.

And as a relative newcomer, I suppose what I can offer you is a newcomer's perspective on the US energy sector. And I don't think in my presentation I'll be saying many things you didn't already know. But what I can perhaps offer is a perspective from someone who hasn't been in the market for a long time to tell you what is, from my point of view, different about the US. And that sort of leads me to where I'll be going with it. And although my focus is on renewables, I'm going to be talking about oil an awful lot, which why will become clear as I speak. But why I also think that the US energy sector as a

whole is at a really interesting juncture right now.

So to sort of kick off on this long-term view, and if we're thinking about what's going to happen in US energy in the next decade, an interesting thing to start by doing is to look at what's happened in the last decade. So this is US power generation. On the left we have 2010. And I brought it up to 2018 just because that's when the data was verified when I made this slide. But the really interesting thing is to focus on what is happening in between. So I've highlighted what's come out of the generation mix. The sort of the net, what's come out net and what's gone in net.

And so you've seen [technical difficulty], and that's been largely been displaced by gas with a thin slice of renewables. And I don't think anyone needs explaining why that is. It's because there's been a huge amount of cheap gas in the last decade in the US. But what's interesting is when we compare this to where I've just come from in terms of my perspective, which is Europe, we've seen a similar amount of thermal generation displaced in the past decade, but that's also included gas, and it's almost been entirely displaced by renewables. So it's a very different picture. And I think something that I want to try and emphasize to you is that the US has, if you compare it to other markets, and in particular European markets, it might not feel like it, but it's actually been quite tough for renewables having to compete with cheap gas.

So these charts are something I've pulled together. The sort of the shaded areas represent the spread in prices in Europe, which is purple, and the United States over the past decade for gas on the left and power on the right. And you can see what I've just been saying that the US has benefited you could say from cheap gas and therefore cheap power. Although, if you're a renewables developer, that hasn't been a benefit. That's made life harder. And I realize that in both the US and Europe, renewables have also been subject to policies that have taken different forms. But the key point is that the gap you need to bridge when power prices are higher is that much less. The ask is less. And so this is something that from the renewables point of view has been a bit of an uphill struggle for US renewables.

So I want to dive a little bit deeper into the sort this last decade and what the status quo is. So let's start by looking at the relationship between gas and power. I don't think there's any -- I'm telling you anything particularly profound when I say that in most markets globally where there's gas in the energy mix, the price of gas more or less sets the price of power. So there's a very obvious connection, therefore, between the outlook for renewables and the outlook for gas.

What makes the US unique is the relationship between the outlook for gas and the outlook for oil. And that's because something like 30% to 40% of gas consumed in the US is produced as a byproduct of oil drilling. You could say that, well, actually maybe the oil is a byproduct of gas, but economically it doesn't work like that. The decision to drill wells is subject to the oil price and the gas is a bonus source of revenue for the owners of those wells; not the other way around.

So you can see as over the past not just decade but over the past 30 years, as US crude output has increased, so has US gas output. Until we reached the last few months and we see there's been a big drop off in both. It'd be interesting to think about what that means. Well firstly, it means that this formula I've described is disrupted. But for the time being, it hasn't had a huge effect because also demand for both oil, gas and power has been disrupted as well. So we're in this sort of slight dead zone where it's not quite clear exactly how this will play out.

But if we look in the longer term -- sorry, I should have made a point here actually as

though -- before I proceeded to that slide. What we have seen in the last month is something like a 30% increase in gas prices. And that's because we didn't see an increase in gas prices when we were in the thick of lockdown because we had both a decrease in gas output coupled with a decrease in demand. But now as demand is picking up again, we're actually beginning to feel that disruption to shale and gas prices are increasing. And they're up at about \$2.30 per BTU at the moment.

So the question is, well, where does this lead? Well, if we look at the -- this represents the marginal barrel, cost of producing a barrel of oil in US shale basins. So we're looking at something between \$33 and \$50 at the two extremes. And we look at what the oil price has been over the course of the last decade, it's most of the time been above \$50. So the last decade has been favorable to the continuing growth of shale. But right now it's at around \$43. So it's bang in the middle of that range where shale is no longer profitable.

So then the question is what's going to happen next? Are we going to end up with it going above \$50, or is it going to go down and stay somewhere below \$40? To answer that question, we look abroad, and it's worth noting that Russian oil costs about \$30 per barrel to produce. Then if we look at OPEC nations, it's between \$5 and \$7. So from that you would say, well, the only way is down then in the price. It's worth considering, well why has it been so high? And that's because OPEC effectively operates as a cartel and has been holding back capacity, which has kept the oil price artificially high in the past decade. But now with the reduction in demand that's been brought on by COVID, that quite possibly is no longer the best strategy for them. And so it may well be that we see them increasing supply as we ease out of the current situation.

Which means then that this model I described where we said the outlook for US power depends on the outlook for US gas, which depends on the outlook for US oil, it now actually, we can say it depends on the outlook for global oil, which is largely in the hands of foreign actors -- mainly OPEC -- which creates this huge uncertainty on whether this chain will be broken. And if that chain is broken, you would expect there to be higher gas prices in the long term, higher power prices and a bigger opportunity for renewables developments. Even if there is -- it's not all favorable for the US for this particular set that this might represent an opportunity.

So I'll wrap up by just asking how the wind might change. And I think it boils down to two questions. One I've dived into in a lot of depth, which is does shale ever recover from its current slump? If the answer is yes, then you'll expect cheap gas, something that's similar to what we've seen for the last decade, a sector dominated by low power prices and cheap gas. If the answer is no, then there's another question that you have to ask, and I think that this panel is really well positioned to comment on this second question, which is is there investment for something new? If the answer is yes, then that could well mean that with higher gas prices and higher power prices, there's investment in renewables and a major transition occurs in the sector. That's for me the most optimistic outlook, particularly for those of us in this room.

There is also a third scenario where there isn't -- the shale doesn't recover from its slump, but also the investment environment remains incredibly difficult, in which case what US consumers will see is more expensive power caused by more expensive gas, and even potentially a lifeline for coal, which has been in retreat in the US in the last decade.

And I will wrap that and hand it back to John.

John Eliason:

Great. Thanks so much, Tom. Kind of getting yours and Bloomberg's view on this is always very appreciated. And thanks for talking about that. And I'm especially interested

in kind of the lessons that we might be learning from Europe and kind of looking into the US.

So from that we're going to go into our panel. You'll see up on the screen really just kind of a general bullet outline from a high level on what we're talking about today. And we're going to be spending quite a bit of time talking about renewable energy finance. And renewable energy finance has, if you're not familiar -- or super familiar with this space, it's got some interesting concepts that you don't necessarily see in commercial financing. In the prep for our panel, Tom de Swardt volunteered to provide us a real brief primer on renewable energy finance and what tax equity is and who the typical players are. Tom, I'll hand it off to you.

Thomas de Swardt:

Great. Thanks, John. Let me do my best with a broad topic. If you think about the business model for renewable energy, if you own a wind farm or a solar farm, you make your money, your revenue by selling power. It's a pretty interesting asset class in one meaningful respect in that we don't pay for sunshine, we don't pay for wind. There are some operating costs. You still have to get insurance. You still have to fix wind turbines if they break. But for the most part, this is an asset class that has very low or close to zero operating costs or marginal costs. And so the business model is all about maximizing your solar output or your wind output in terms of energy and multiplying that by the price of energy.

And Tom Rowland-Rees talked a little bit about how gas is setting the price of energy in Europe and in America and really most markets in the world, and that's of course true. But renewables benefit from one specific thing in the US -- or historically they have; it's changing a little bit now. And that is that we get long-term power purchase agreements or contracts or hedges where we are selling the power at a known price today. So if you know today that you're going to sell power at \$25 per megawatt hour, \$30 per megawatt hour, whatever it is, and you know what your energy output is going to be because the engineers can bottle that, you end up with an asset class that has a very predictable revenue stream. And that means that it's very well suited to getting attractive financing. Banks really like to provide capital to this kind of asset class because it's generally pretty low risk. The ultimate risk is a utility paying for the power. And there's again very low operating costs. So it tends to be a fairly financing intensive industry. It's also capital intensive.

And then I would say that the other part that I would just touch on that's maybe a little different in the US or a little unexpected perhaps is that the main public policy driver in the US is really through non-refundable tax credits at the federal level anyway. And this is super important, because what it means is in order to get the tax credits and use the tax credits, you have to pay taxes. A tax credit is not very helpful to you if you're not paying taxes in the first place, obviously.

So what happens is is that there are a cluster of large corporations, profitable corporations that pay a lot of tax that are providing the specific kind of financing that John just referenced, which is what we call tax equity. And tax equity is a function of those banks' profitability. And we'll talk about this a little bit in the panel, but that's been one of the big topics coming out of COVID this year is how profitable are corporations going to be, specifically the corporations that provide this tax equity financing. And will they be able to have -- will they have capacity to continue providing this super important form of financing for the renewable energy industry? The banks on the debt side, it's a pretty familiar story. Again, it's a very popular asset class. It looks and feels quite like real estate. Slow and steady long-term loans. And that's been relatively unscathed. On the tax equity it's been a very different story.

I'll just finish by talking a little bit around who's investing in this asset class, who's the equity. This is again a lot of the long-term owners of this are equity providers who are looking for slow and steady cash yields, dividend kind of vehicles. In some ways analogous to a REIT or an oil MLP where you're putting a lot of capital in and then collecting a slow and steady revenue stream over what could be 40-plus years. That's where I sit. That's the classic equity in contrast to the banks doing the lending and then some of the banks doing the tax equity. John, I don't know if you'd fill in anything I missed.

John Eliason:

Tom, I thought that was great. I think one of the things that it's just important to keep in mind is that under current federal law, you can't just sell tax benefits to somebody. Rather, with a couple exceptions that we don't need to go into, they really flow based on an ownership. So when we have a tax equity investor coming into a transaction, we're really putting them into the ownership through a partnership arrangement is most difficult. And then benefiting from federal tax provisions that allow special allocations of credits and income and losses of the partnership among the partners. It's definitely something that if you're kind of more used to like a feed-in tariff scenario or other scenarios that other countries use, it's certainly a unique way of structuring transactions. But it's really more reactive to the government policy that we're facing.

Will, I know that M&T Wilmington Trust, they see a lot in the market. I'd like you to just kind of start the discussion about kind of what you've been seeing out there.

Will Marder:

Yes. Sounds good. Thanks, John. Yes, I'll provide some market overview based on what we've seen. So again, as I was saying before, we are a third party provider of trusted agency services. So we're not a lender. We're not an investor. And because of that, we tend to really follow the market, whether that's in terms of deal types, sectors, structures. And the kind of clients that we work with really span across the capital stack. We work with commercial banks, institutional investors, infrastructure debt funds, as well as government entities and multilateral institutions. And really because of that diversity, the deals that we see are really a snapshot of the market as a whole.

To give you some background I think on how important renewables are to us and how much that's been growing, we've done nearly 250 project financed transactions since the beginning of 2017. In 2017, renewables comprised 44% of the deals we did. That increased to 50% in 2018, 56% last year. And so far today in 2020, believe it or not, 65% of the deals we've done this year have been in renewables. And actually which I'll touch on in a few minutes, that actually mirrors the market quite closely.

I'd say predominantly our deal flow has been in wind and solar, but we've seen a little bit of geothermal, hydro, some landfill gas, and maybe the odd methane capture kind of transaction. But really, a lot of the growth has been in wind and solar. Solar has been especially strong. Especially we've seen a shift from traditional utility scale project finance to things in the commercial and industrial space, as well as distributed generation. And I would say that solar as a component has really outpaced wind considerably. When I would have said, my gut would have told me it was maybe 50/50 in the past, solar probably comprises about 70% to 75% of what we see now. And that's just been -- really has accelerated tremendously over the last kind of 5 to 10 years.

In terms of I think where the capital is coming from, it's typically bank loans and bonds. There is some activity in the private placement, with the private placement product, but it's a relatively small percent of the overall market. It is growing, though. So historically, private placements have made up maybe 5% to 7% of deal count in the broader project

finance space. And if you're looking at it in terms of funded volume, it's maybe 10% to 12%. That number has definitely grown recently. I took a quick look earlier this week on Infrastructure Journal and pulled some data, and they counted 90 commercial bank loans across all sectors in the US and 18 bond deals. So the bonds, the bond financing represented about 17% of the market. So that's a lot more than we've seen historically. And in renewables, there were 60 deals and 7 -- 60 commercial bank deals and 7 bond deals, so only 10%. So kind of interesting there that renewables are not utilizing bond financing quite as much as the broader marketplace. But it is interesting to note that renewables made up 60%, nearly 60% of the total deal count across all bank and bond deals so that, again, that mirrors what we've been seeing pretty well.

Couple other things we've been seeing. Certainly a lot of back leverage transactions. That's the debt raise at a holding company level. That's been very popular. And that's been true for some time, especially in the renewable sector where you typically have tax equity financing at the operating company level and then sponsors maybe raising capital at a holding company level to monetize some of those upstream cash flows.

We're seeing certainly traditional PPA deals, but we're also seeing corporate offtakers. And there's been quite a bit of activity in the news, specifically Facebook, McDonald's Verizon just this week announcing new corporate offtake arrangements. And we see a lot of hedges. A lot of hedges there I think as people are maybe taking a little bit of pause. Tom from Bloomberg touched upon the low price of natural gas. And we'll talk about this a little bit later on the panel, but I think that's driving folks to say, hey, I'm going to put a hedge on for a little while. Let's see if the PPA market kind of improves.

And we're also seen some green shoots I'd say in the offshore wind sector, which is great. I think there's certainly a lot out there. I see that there is a project, the Coastal Virginia project was the first to go into commercial operation in federal waters that just happened within the last couple of weeks. We closed our first offshore wind deal last month off the coast of Maryland. We're very excited about that. But overall, I think the market has been strong. The pandemic has not done that much to dampen the mood on this sector. I think if anything, it's been quite the opposite. Some initial questions maybe around supply chain issues really never materialized. Generally speaking, energy remains such an essential service, and more and more people want that energy to come from renewable sources. That's true I think with the public at large, as well as with offtakers. There's been a lot more talk around the so-called ESG principles, as well as impact investing. And there seems to be good liquidity in the market right now.

So I think I'm pretty bullish on where renewables are right now. We're seeing good activity among lenders, the traditional players, further supplemented with increased activity from regional US banks, continued strength of infrastructure debt funds. And as well some newer entrants and folks that maybe were a little bit quiet, a little bit kind of off in the background just as participants in the market now kind of stepping up to lead and arrange transactions. So I think with that as a backdrop, it'll be interesting to get the panel's view on sort of where things stand with regards to tax rev programs, the availability of tax equity. And I think where we're coming from, we see continued high level of activity.

So with that, John, I'll turn it back to you and look forward to hearing from the rest of the panel.

John Eliason:

Yes. Thanks, Will. I'd be curious to hear from Eric. M&T is a tax equity provider. There's been some large high profile deals lately. Eric, what are you seeing on demand for tax equity? And then separately I'd like then Tom de Swardt, if you could comment a little bit

on kind of that same question from a developer sponsor side, and then also to talk a little bit about the PPAs and kind of whether you've been enjoying kind of working with corporates versus utility. So I'll start with Eric. Eric, tax equity. Tell us about it.

Eric Heintz:

No, appreciate that, John. And I think tax equity is certainly a very unique market. And I think Tom de Swardt alluded to this and so did Will that the capital markets I think at this point in time are pretty flush in a variety of different sectors and loan type vehicles and investment vehicles. Tax equity is unique in that it requires the investor to have material taxable income to be able to monetize the tax credits. And so we're certainly very active last year. We're active this year.

The big question for bank investors, a whole variety of different size of bank investors, maybe within the exception of the very largest, the question is what is our tax position going to look like particularly next year. I think there's relative certainty as to what it will look like this year, and we felt pretty comfortable about 2020. The question is in 2021, what will our loan loss provisions end up in by way of charge offs? And that's a big variable. A lot of uncertainty in the forecast is driven by charge offs. It's driven by potential concerns and changes over public policy, which actually may benefit the sector, may benefit investors' capacity, but that's the big issue. There's also clearly compressions in net interest income, which have driven down the tax positions of bank investors.

So as we look out into 2021, as we look out into 2022, I'm confident that there will be capacity. The question is when we'll have certainty over what that capacity will be. So I think you've seen a lot of investors, tax equity investors, super regional institutions like M&T taking a more wait, pause and wait and see approach by way of deploying additional capital, committing to additional investments going forward.

But the other thing I would say about COVID and its impact, as we look back at the beginning of the crisis, there were concerns over supply chain disruption, over labor disruption. And I think as Will mentioned, neither of those have really had a tremendous impact on the deployment of assets, particularly those assets that were close to construction or under construction already. Labor's been deemed essential in the power and infrastructure space in essentially every jurisdiction in the country. And the product being shipped from Asia may have been delayed, but really on an immaterial delay basis. We're talking a matter of weeks, not a matter of months.

So I think that the big issue as we look in the renewable sector in my mind is supply of tax equity. And at this point in time, as we look into the fourth quarter, I think if you're a sponsor, it's very challenging. And if you haven't found capacity for this year, it's pretty late to the game. And even looking into next year, it's challenging to find capacity in the marketplace.

John Eliason:

Yes, Tom. You're a sponsor. How does this impact your plan?

Thomas de Swardt:

No, I absolutely agree with everything Eric said. It's been a pretty challenging year. But I think tax equity is probably the big story coming out of coronavirus.

When you're planning a wind farm or a solar farm, it's a 2 to 5-year planning cycle. This is not something you just go and decide, oh, I'm going to build a solar farm tomorrow. You have to go and get land. You have to get permits. You have to get interconnection position to the grid. You have to go and get power purchase agreements. Then you have to get the financing and then you have to construct these projects. And it's really that last piece where you're seeing a lot of impact. It varies, of course, but typically constructing a utility-scale solar project takes about 12 months. And in order to do that, you have to plan

backwards and say all right, I have to build a project that will come online let's say in 2021, Q4 2021. That means I need to raise all the financing and the capital or at least have it committed about 12 months prior in Q4 of 2020, at least. Probably more like 18 months if you're being a little more prudent.

And while what Eric's saying I completely agree with, I think there will be tax capacity eventually in 2021 and in 2020, if banks are unable to commit, it has a sort of self-fulfilling prophecy effect in that if you are not able to get a commitment today, 12, 18 months in advance, you're not able to get the bridge loans and the financing you need to start construction. So it can be very, very challenging. Unless you have a very large balance sheet and you're building a lot of this with equity on your own balance sheet, it can be very challenging to get the financing in place without the tax equity spoken for and committed 12, 18 months in advance. So that's been a really tough challenge to deal with.

John, to your other question on how are we seeing PPAs and hedges and corporate offtake respond, I think a lot of the techniques developers have used is shuffling when the tax credits are earned from one calendar year to another. So there is a big difference in a project that goes online on December 31, 2020 versus a project that goes online in January 1, 2021. Even though it's one day, it's a different calendar year, it's a different world depending on the tax investor's appetite. So there's been a little bit of moving PPAs around when these projects come online in different calendar years. I think that's been one of the big techniques. I think people are also doing a little bit more equity finance of these deals as they wait for the tax equity market to open up.

And then with respect to how are we seeing the offtake market change, I would completely agree with Will's comments. There is a larger and larger percentage of corporate buyers of power. The FANG, the Big 4 tech companies, a lot of financial institutions, other heavy users of power, we are seeing more and more some of those names procure power directly rather than through the local utility. That is a change, and that is largely driven by the very, very attractive economics we're now seeing for solar and wind power. The prices just continue to come down. As Tom Rowland-Rees was saying, the cost of these technologies has dramatically declined, and therefore the price of power has declined and got a lot of interest from the corporate sector.

John Eliason: It allows corporations to meet the corporate sustainability goals also, right?

Thomas de Swardt: Absolutely. And what you're seeing is I think probably a few years ago, a lot of corporations would just buy the renewable energy credits, these sort of paper credits. They would say we're offsetting our load, our power usage with renewable energy credits. What's changed a little bit is that now I think a lot of the ESG focus has shifted to actually physically buying power rather than buying a financial product. A lot of these organizations are actually co-locating wind farms and solar farms near their data centers, near their retail presences where they have electric load.

John Eliason: And Tom, as -- go ahead.

Eric Heintz: Tom, this is Eric. I think another interesting aspect of what we've just seen is a utility trying to stay relevant and actually sleeving a contract on behalf of a large tech company. I think there are clearly a whole host of different ways that these corporates, particularly the largest of them, the highest users of energy in the data center sector that are procuring. And that the number of institutions, corporates and non-corporates alike globally that are making 100% renewable energy procurement commitments and mandates is just only increasing at this point in time. There are corporates that have even

made commitments to go carbon negative, effectively erasing their carbon content contribution from the beginning of when they started operations. So that is clearly driving demand both in the utility contract and the direct to corporate contracts as well.

John Eliason: Tom de Swardt, I imagine you have some interesting conversations when you're explaining to a new corporate offtaker that you can't start construction of their facility yet because of the tax equity constraints. There's an education process here, too.

Thomas de Swardt: Absolutely. And we've had to incorporate in some of our contracts new provisions now that relate to this exact risk. And we've, as I said, somewhat successful in being able to change the year in which we provide the power, the calendar year in which these projects will come online to be a function at least partially of the availability of tax equity. I think everyone is nervous about 2021. Hopefully the financial markets are stabilized somewhat by 2022, and the corporates will have a little more predictability around what their profitability and tax position will look like. But for sure, anything that was coming online in 2021 we spent a lot of time with offtakers, educating them on the tax equity market and what some of the implications will be for when this power comes online.

John Eliason: Yes. And we've been talking about COVID, but that's obviously not the only thing people had to deal with recently. Last year we had the big fires in California and PG&E's bankruptcy. Fires again this year. Hurricanes kind of more regular. Just kind of an open question, and maybe Will we can start with you, is just like what are these experiences teaching us in these transactions?

Will Marder: Yes, it's interesting. It's interesting, John. [Technical difficulty] on PG&E. I think they are [working from] bankruptcy. You know they got approval from the FERC and CPUC on their restructuring plan. They've actually been able to raise significant funding in a number of different [technical difficulty], investment grade, non-investment grade. There was even a term B loan transaction in there, with a lot of these transactions oversubscribing and the pricing kind of pulling in from the initial estimates. So I think that's [technical difficulty] at restructuring. There was cash maybe that was trapped at some of the projects that were selling power to PG&E. It was trapped as a result of that bankruptcy. Now it's flowing again since they're emerging with that restructuring in place.

But I think to get to your question that it really focused everyone's attention on just how antiquated some of the country's transmission assets are. And it dovetails with renewables and dovetails with a focus on ESG. And it's raised interest in distributed generation assets even more. I think that in a way, sometimes a negative, something negative like this, the buyers, the bankruptcy, it can spur on new and emerging technology. Certainly battery storage I think is poised to be a winner coming out of this as we look for ways to move power more safely, more efficiently, more economically.

Anecdotally, I think when we've got a pretty large portfolio of deals, we really didn't see any direct impact on our portfolio from that bankruptcy. There were certainly a lot of talk about it, and we had our sort of eyes open. But I don't know. I think we didn't really see anything there. I think where we're seeing more impact is from those low natural gas prices that Tom was talking about. That's really having a big impact that is shaping the industry from we talked about corporate PPAs and hedges taking the place of that traditional long-term utility PPA structure, and that's certainly what we're seeing. When you look at kind of Henry Hub spot prices and how incredibly low they are, less than \$2. If you look on the government's EIA website, Energy Information Administration, you could look at the average prices going back decades, and the prices really haven't been over \$5 in MMBtu for 10 years.

So that kind of translates into some pretty unattractive PPA pricing for a while. So I think that, in turn, these kind of dynamics have created changes in the space. They're causing people to kind of look elsewhere, be creative. And Eric was touching upon just how many clients are looking to go carbon neutral, and they're making pledges. And those are exactly the kind of folks that are entering into these corporate PPAs.

And interestingly, I think as some of the other folks were saying that when you think about where demand growth is coming from, we're not driving, we're not riding the trains, we're not on aircraft, we're not running lights in skyscrapers. But we're all here logged in on the internet, using broadband. I know here at my house, the kids have been exercising Netflix like it's their full-time job. And those are -- that's exactly the same folks. There's this intersection between high tech data centers and renewables because those are the entities that are -- they're very interested in sustainability and they've got demand growth. So those are the entities you see out there really active on the corporate PPA space. So it's really interesting I think how some of these different environmental things going on are kind of driving changes across the renewable energy sector.

John Eliason:

Thanks, Will. Yes, you kind of see the progression of renewables. And every year they're a little less dependent on government incentives, needing less government subsidy, but it's still an important component of a transaction. We have a question that came in, which I'll just kind of pose to the panel, is when do we think solar will become economic and not depend on government subsidy?

Tom Rowland-Rees:

Can I jump in with an answer to that one? So I won't put an exact date on it, but it's certainly in a matter of years. This is already the case in Europe and a lot of countries that it is we've transitioned to the era of what we call merchant renewables where power market prices are higher than the all-in cost of building a new plant. The thing I would emphasize is that when you hit that point, the questions change because you lead into separate considerations around market design. And if it is that renewables are able to survive subsidy free, and if that then leads to a huge buildout of renewables long term, that will suppress market prices. And you end up with a slightly paradoxical problem of the system that might be most economic can't be built because it cannibalizes its own prices.

So there are possible solutions to that. One would be that you maintain long-term subsidies, which again seems paradoxical if we're saying that renewables are no longer dependent on subsidies. But it's exactly in the same way that a capacity market is paying, say, thermal generators to stay open, you could argue that if the benefit the renewables brings is cheap energy, you have to create some kind of framework to reward them to offset the fact that actually when they're all generating together, the wholesale power prices will collapse to zero.

So we are approaching the era I think in North America of renewables that are in theory capable of existing without subsidies. But even when they are, the question shifts and there needs to be a new kind of subsidy or market framework adjustment to support them.

Eric Heintz:

Tom, thanks for adding that. I'd also note that there are drastic differences in the cost to build renewable assets depending upon where you are in the country. And then the cost of the cheapest power source or the next cheapest power source is dramatically different as well. So if you look at the southwestern part of the United States, there are situations in which you're already at the margin in certain situations that we've seen. And just to put it in perspective, if you go back in time 10 years, you were close to \$200 a megawatt hour in a long-term solar contract. Today you're closer to \$20 per megawatt hour. So the cost

declines that we've seen are tremendous.

And then if you were to pull all the subsidy, I think you still get some deployment of renewables, but you dramatically slow down the energy transition to a much greater density of renewables on the grid. So it's -- the way I see the subsidy now is it's really there to incentivize that transition because you're displacing a lot of antiquated assets on the grid, and there's a need to stimulate that from a public policy perspective, at least from the US federal level.

Thomas de Swardt: Yes, Eric, I totally agree. I would just add, there's another big locational difference, which is the levels of solar irradiation and wind. If you go back again to sort of the key legs of the business model, price times volume, if your volume component, which is really the amount of energy you produce, is high because you naturally have a very sunny area, which is true in the desert southwest, less true in the northeast, you are going to have a natural advantage that you can be more competitive in that environment just because you're going to get more megawatt hours of energy out of that same asset. So I would agree. It's very variable by location, even within states. Sometimes even within counties. But it's very close. I would certainly echo Tom and Eric your points that this is - - if it's not already here in some markets, it's here in a matter of years.

John Eliason: And well, and we also have an election coming up. What's the planning there? Tom, maybe I'll stay with you.

Thomas de Swardt: Yes. It's an interesting question. Again, sort of the federal policy is really driven by tax credits. So I think we'll all be waiting with baited breath to see whichever administration is in power at the end of the year, it's going to do on tax credits. That will be the big driver.

But I'd also just add that I think a lot of renewable energy public policy actually happens at the state level; not the federal level. And that happens where a state will mandate effectively that its utilities buy a certain percentage of power from renewables. So there will be what we call renewable portfolio standards, or RPS, and a state will say, all right, we are going to buy 25% of our power by 2025 and 50% by 2030, et cetera, et cetera. That policy is somewhat insulated from the federal level and the November election. And so we've actually seen -- it's not zero, of course, but we've seen a relatively modest impact at the federal level in terms of long-term drivers of renewables provided, again, that the states continue some of these -- the supportive policies that they have historically supported.

Eric Heintz: Yes. And John, this is Eric. So there are a whole host of potential outcomes from a public policy perspective. If we have a change in administration, I think we could -- and if there is a change in the Senate as well, if you have a democratic sweep, you could look to the Moving Forward Act, and there were long-term extensions of renewable energy credits. And I think it's also possible that we see an increase, if there is a change in administration, an increase in the federal income tax rate, which for tax investors is a two-fold benefit. It gives us more capacity by way of taxable income to ultimately invest and monetize, and then it also increases the value of the depreciation benefit. So I think that's -- those are some interesting considerations.

The other thing I would clarify, too, I think there was a question that's popped up along the way is that the investment tax credit as it stands today has dropped to 26%. For those assets that began construction this year, if you began construction -- and this is a technical tax definition -- but if you began construction last year, you're able to carry that 30% credit all the way forward through the 2023 tax year so long as you place your asset

in service by that year.

So what does that mean? It means that we're going to have high levels of investment tax credit for solar assets as currently legislated through the end of 2023 at a minimum. And then thereafter we'll have a 10% credit, unless that's legislated away. So the expectation for us is what is -- we're planning on what is currently legislated, but there's certainly a host of potential positive outcomes from a public policy perspective going forward.

John Eliason: Well, it's certainly an interesting end of the year, right? We only have a few minutes left, and I want to make sure we have time for some questions. But before we go that, Tom Rowland-Rees, we started with you. Maybe we can end with you as well and you could kind of talk a little bit about kind of what your expectation is on a kind of a short-term and long-term outlook just really briefly.

Tom Rowland-Rees: Sure. A lot of the things that I would say we've sort of covered. So I think the forthcoming election is going to be important. And in certain ways we can overstate its importance, but we certainly shouldn't understate it. I think there's a huge amount of uncertainty related to the future of shale, which could have long-term implications. So I would say keep looking at that the gas price is currently rising for the last two months. It's gone -- shot dramatically up. It'll be interesting to see how far that goes and if it starts reaching the levels of say \$5, which would start to change the market considerably. At the same time, it'd be interesting to keep an eye on the oil price because of that related -- the related impact on shale.

And then in terms of renewables build, in terms of the pipeline and the things that have had to be shifted to 2021, at BloombergNEF we're expecting to see record levels of build in the US, despite all of the challenges and problems. The question is can that get financing, but the potential is certainly there. And so I think that 2021 is going to be an extremely interesting and potentially groundbreaking year in the country.

John Eliason: Well, it certainly won't be boring, right? Well, we do have some time for some questions. Doug, thank you so much for kind of going through these and creating some priorities. I guess the first question that we have here is what's the role of storage and super transmission? May we reach a time when wind will be all over Montana and solar will be in Arizona? Tom de Swardt, what are your views on that?

Thomas de Swardt: Yes. Storage is clearly a hot topic and one of the big catalysts for renewables. If you look at what's happening in, say, California today, you are seeing some of the limitations of renewables insofar as these are not dispatchable energy assets. You cannot just dictate that you turn on the sun or turn on the wind, obviously. So batteries are clearly going to be a pretty big enabler of renewable energy. We are starting to see a lot of interest from utilities in co-locating batteries with solar projects especially. We at D.E. Shaw at least have not yet built a battery project. There's been a lot of talk about it and there's been a lot of talk over a number of years. But I do think this is now an asset that's come of time and we should be seeing in the relatively near future a lot more storage with renewables. And that will enable, as the question said, wind and solar all over Montana and Arizona.

Eric Heintz: This is Eric. I'd add onto that that the storage doesn't need to create a solution for a matter of days. It's a matter of hours. Because your biggest issue is matching the load that's occurring when folks come home from school and work or whatever it is and all that load that's coming in in the evening when solar generation in particular is coming to an end. So your 4-hour battery or your 8-hour battery are essential in that regard. And I think my perspective, or at least what we're hearing is that 2022 and beyond, I'd say the majority of assets will either be coming with battery or prepared to come with battery shortly

thereafter.

John Eliason: Great. Thanks, Eric. And actually the next question I want to kind of stay with you on. The question is, "Tax equity provides negative pretax pricing for financing. How does one expand the universe of tax equity investors?" Eric, maybe you don't want to expand the universe. What do you think?

Eric Heintz: So we actually don't have negative pretax earnings. We have strong pretax earnings based upon the accounting elections that we've made. And I think our accounting elections -- and I'm referring to the ITC, the investment tax credit for solar. The PTC is a different animal, the production tax credit for wind. But when we refer to the ITC, I think most investors have made accounting elections that allow the investor to very quickly write down its asset by the amount of the tax credit and then generate positive pretax earnings thereafter.

Unidentified Participant: John, I think you're on mute. I see you speaking there, but --

John Eliason: Sorry, everybody. I got it.

I wanted to thank our speakers for a most interesting, frank and lively discussion. And thanks to all of our audience for joining the fourth webinar at M&T's Commercial Specialty Lending Series, Managing Through Challenging Times. Please visit MTB.com/managing for replays, recaps and transcripts of M&T's previous webinars.

We all appreciate the thought provoking questions you've asked and the candor of our panelists. You will all be receiving a follow-up email from M&T Commercial Banking with a short survey about the panel discussion, a replay and a recap of our webinar today. It's really helpful for the bank and for these programs to take time to fill that survey out, so we'd really appreciate it. Thank you, everyone, and have a wonderful day.