

Power Finance & Risk



OFFSHORE WIND ROUNDTABLE 2018

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Offshore Wind Roundtable 2018

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SPEAKERS:

Chris Moore, partner, **Orrick, Herrington & Sutcliffe**

Paul Zarnowiecki, partner, **Orrick, Herrington & Sutcliffe**

Greg Remec, senior director, **Fitch Ratings**

Eric Thumma, director of policy and regulatory affairs, **Avangrid Renewables**

Anne Marie McShea, offshore wind program administrator, **New Jersey Board of Public Utilities**

João Pedro Summavielle, director of finance, **EDP Renewables**

Rael McNally, director alternative investments, infrastructure and renewable power, **BlackRock**

Jennie Rose, director of infrastructure debt, **Barings**

Jorge Camiña, director of infrastructure debt, **Allianz Global Investors**

Shravan Bhat reporter, **Power Finance & Risk** (moderator)

PFR: What are the key regulatory challenges to note when looking at offshore wind in North America?

Thumma, Avangrid: From our standpoint, we always want credit worthy counterparties, whether it's an onshore project or an offshore project. The offshore projects being so large, and having to be backed by so much capital, it really requires state leadership to make that happen, and I think that's the real challenge. At least for this first round,

it's really state policy that is driving the demand. We have about 9,000 MW of state (i.e. legitimate) demand, between New York, Massachusetts and New Jersey; basically the states are telling the load-serving entities that they're going to have to do some form of offshore renewable energy credit or power purchase agreement.

So as we build out this market, and we want to make it more robust and build supply chains, are we going to continue to have other states adopt those policies, or are we going to

have to go in a different direction that looks more like where we are with commercial and industrial customers in the onshore wind sector?

PFR: The question, then, is what is driving those states? Is it just the local politics— i.e. that liberals want more renewables? Is it job creation, and if so how can that scale on to other states?

McShea, NJBPU: New Jersey was the first

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state to establish an offshore wind carve out under OWEDA [Offshore Wind Economic Development Act] in 2010, and at the center of that law is a requirement to demonstrate a net economic benefit. Clearly economic development was at the heart of that legislation. Governor **Phil Murphy** has since re-invigorated that commitment, and set a goal of 3,500 MW by 2030, and that's in response to both climate change and a commitment to transform the local economy to a clean energy economy. We have an RPS [renewable portfolio standard] that has been the key policy driver since 1999, and will continue to be until you have carbon pricing in the market.

Thumma, Avangrid: Just a reflection that I hope is a lesson that we can bring to offshore as well: When I started doing renewables in 2002, in Pennsylvania, it was a coal-heavy state. If you talked to people, they said it was going to collapse the Pennsylvania economy. If you went around and you looked at Wisconsin and other states, there was a view that renewables were going to be detrimental to economic growth. Instead, what has happened is the combination of federal and state policy has done what it had intended to do. They drove down cost to the point now where coal-heavy utilities like **NIPSCO** or **Xcel** in Colorado are saying renewables are the lowest cost resource, beyond conventional resources.

So we're not there yet with offshore, but I think we can see that vision for offshore wind in six or seven years. We've already seen dramatic cost reductions from Cape Wind, which I think was somewhere over \$200/MWh (levelized) to the offer now at Vineyard.

McShea, NJBPU: Just the dynamics of the market for New Jersey play a lot into it. We're at the end of the pipeline. We serve as a gateway to **PJM Interconnection**. Currently to meet our Class 1 RPS, we are spending millions of dollars on resources, specifically wind imported from western PJM. [Offshore wind] would displace those Class 1 RECS with New Jersey-based RECS that deliver not only the power and the emissions reductions but also the economic benefits.

Moore, Orrick: When you mention the economic benefits, are you talking about beyond just the jobs associated with the development and operation of the wind facility itself? Does New Jersey look at further value streams regarding economic development?

McShea, NJBPU: I would say yes – especially when you consider that we recently moved forward with a solicitation for 1,100 MW. The governor has called for two additional solicitations of 1,200 MW. That build-out is going to occur over a 10-year period, so it's more than just the immediate jobs associated with every project. It is really the localization of supply chain and all the secondary and tertiary benefits that come with it.

Thumma, Avangrid: I think that's the hope. If you look at some of the scoring [of bids], in New York for example, they're going to be looking at what kind of development dollars you're going to be bringing to the port system and so forth. If you look at the latest RFP in Connecticut - everybody's making offers to upgrade ports and things of that nature. So in addition to the jobs related to the wind farm, people are hoping that the broader coastal infrastructure will get built out.

Camiaña, AllianzGI: To state the obvious, the potential of offshore wind in the U.S. is somewhat limited and state driven. What drove the success of offshore in Europe was the scarcity of land, proximity to good wind resource and reasonable transmission cost to the appropriate load locations. In a way, it makes a lot of sense for certain states in the U.S. to pursue this initiative, but it's not going to be anywhere close to the exponential growth we have seen for onshore wind.

The other interesting factor is the unfortunate timing of offshore wind in the U.S. The federal incentives have been in place for a while and [offshore wind] is a very capital intensive effort – so even though cost has come down dramatically, it's unfortunate that it won't benefit from the full extent of the incentives. If you start the construction of a wind farm in 2019, which is the deadline for the ITC [investment tax credit], you are getting a 12% incentive. That, a few years ago, was 30% of your capital investment.



"In New York, for example, they're going to be looking at what kind of development dollars you're going to be bringing to the port system"

Eric Thumma
Avangrid Renewables

PFR: You all have seen what's happened in Europe. How did they manage to build all of these assets without the same kinds of policies that we are saying we need here in the U.S.?

Summavielle, EDPR: From a development perspective, I believe there is another important issue that will be quite difficult to overcome: On one side, federal authorities are in charge of the site leases but on the other side, states are in charge of their procurement targets for renewable energy - and the two are not moving at the same time. Maybe they have different targets and one is independent from the other. It makes things more difficult for developers mainly because we are seeing the premiums that you need to pay in order to get the leases increase dramatically, meaning that you need to deploy a large amount of capital at a very early stage without clear visibility on the PPA side.

It is something that I believe was done differently in continental Europe - either in the first ones in Germany, or later in France. When you were competing to build an offshore wind farm, you were also getting the site, the PPA, and certainty/protection regarding the interconnection conditions. Everything was guaranteed at the same time from the state. That provides you much more confidence regard-

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ing the investment and the capital that you need to commit in order to develop the wind farm.

McNally, BlackRock: I'd agree with all of that. When you are starting a new industry, there are going to be problems that you need to work out that inevitably result in time and cost delays for the projects. Having a clean RFP package that delivers all of the non-



"Bidders need to really think about, and understand, state-by-state issues, federal issues, and then the myriad of other umbrella regulatory issues like the Jones Act."

Rael McNally
Blackrock

technical constituent components to bring a project to completion is transformational for a bidder in an RFP as it reduces the standard deviation of possible outcomes. It is also worth noting that the dollar values of the feed-in-tariffs in Europe were much higher than the prices seen in tenders today so there was more buffer for returns in the event of any unforeseen issues.

In the U.S., to Jorge's point, it is unfortunate that we've got RFP tenders that are run on different timelines to Bureau of Ocean Energy Management leasing, to ITC expiration, etc. The different approaches by state also mean that there is no standardized set of parameters for bidding, because bidders need to really think about, and understand, state-by-state issues, federal issues, and then the myriad of other umbrella regulatory issues like the Jones Act.

Summavielle, EDPR I made a reference to

Germany and France, but the Netherlands was the first one promoting auctions completely free of subsidies. Why? Because on top of what I said, they offer you the lease, the PPA, the grid connection and also all the permitting. That is very important in terms of this time-frame between the day you bid, the day you can start the construction and achieve commercial operation date.

Rose, Barings: Yes and that obviously facilitates the financing side of it. Lenders are unlikely to take permitting risk.

PFR: Since it's Halloween I guess we have to mention the Jones Act, because when I speak to people at conferences they ask how are we going to get around the Jones Act and no one seems to know. What are the most viable solutions to working around the Jones Act?

Zarnowiecki, Orrick: If you look at the Block Island project, you saw one small-scale project's ability to work around it, through a combination of a European lead-vessel and U.S.-flagged Jones Act compliant U.S. vessels. It established the precedent that there is a work-around. However, that's solution number one. This is a difficult approach that can drive up costs significantly. And if you're talking about the much larger projects that are planned, it seems that a different solution is needed.

Camiaña, AllianzGI: A couple of lessons learned from the experience in Europe: not surprisingly, offshore wind took longer to build, had construction cost overruns and also the operational cost was initially higher than people thought. But at the same time as the buildup in Europe was taking place, oil and gas prices came down a lot. All of a sudden you had all that supply chain that was initially dedicated to the offshore drilling and offshore oil platforms service, etc., reallocated to offshore wind.

That was a very positive factor to many projects in Europe, which benefited from lower operational costs. It was a temporary lack of competition from the oil and gas sector. Now when we are developing offshore wind in the U.S., oil prices are higher. As a developer, are you going to benefit from having a vertically

integrated supply chain already in place in the U.S., or to what extent are you going to be competing with that capacity?

McShea, NJBPU: I don't think you can really address that issue without having full view of the pipeline of capacity. When I look today and see 10 GW visible all on the eastern seaboard, and you start to understand the timeline, I think we'll start to see some of these issues be resolved.

Moore, Orrick: And that pipeline may help to develop competition among suppliers, because right now I think things are going to be built for specific projects, we just don't have the experience and the depth of competition to provide those services in the U.S. yet. If there's a pipeline that equipment suppliers and vendors can see actually coming to market, then there's more of an incentive to build up the competition and alternatives among the suppliers.

McNally, BlackRock: And [the Jones Act] has also been an issue for the oil and gas industry, so it's not like it's a uniquely offshore wind issue - it's an energy and regulatory issue. There's no shortcut for financing around the Jones Act, so it's getting either a clear affirmation as to what is acceptable and what's not acceptable before you do it, or just working within the framework that exists. There have been multiple go-arounds on the oil and gas side to try to solve for pieces of the Jones Act that they've found troublesome or problematic without any real movement of note to date. There's no obvious silver bullet.

PFR: I'm curious just to get your take on some of the consolidation that we've seen in the industry recently, with Ørsted buying up Deepwater Wind. Do you think that as developers have larger mandates, they can use economies of scale to drive down costs?

Zarnowiecki, Orrick: I think the consolidation and the entry into the market of some of the larger players that have vast experience in Europe is going to be very helpful to the development of the U.S. offshore wind sector. One interesting characteristic of the U.S. onshore

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"In Europe, one of the main drivers behind offshore was the lack of onshore options."

Greg Remec
Fitch

market is that there have been lots of smaller developers operating quite successfully across the U.S. with some very small teams. But as you move offshore, you're talking about a large infrastructure project and it becomes much more difficult for a smaller developer to do that same thing. The larger players are needed to accelerate the industry. Access to equity financing, the ability to execute on the larger financings, the ability to attract cash equity. Capital, of course, is key. Offshore projects require significant equity infusions at an early stage.

Remec, Fitch: In Europe, one of the main drivers behind offshore was the lack of onshore options. And we don't have that here. There's an argument to be made for transmission constrained regions...

McShea, NJBPU: Like New Jersey! That is exactly our situation. There is no place to put new generation up. New Jersey is the most densely populated state in the country, and we're in a very constrained area. New York is already relying on our grid and transmission to move power.

It's not just environmental or economic, it's the need for new generation. By 2030, we will lose about 3,000 MW in nuclear generation, and offshore wind has an opportunity to replace that.

PFR: What do you think are the lessons learned so far in running a successful bidding process and what could be improved upon?

Thumma, Avangrid: I think BOEM has done a pretty good job and we've been encouraged by them continuing to push for leases. Our challenge is to make sure to match up state public policy with the federal public policy with BOEM.

PFR: I want to ask about the costs of the components. How fast do you see those costs coming down? Are we going to see the same kind of hockey stick curve that we saw for solar?

McNally, BlackRock: People are talking about 3 GW to 4 GW installed as a tipping point for U.S. offshore to become an established market, but that's desktop research. If you think about just the supply chain and manufacturing costs, you may get the benefits of what's happening elsewhere in the world in offshore development and technological advancement as equipment gets bigger and more efficient. OEMs [original equipment manufacturers] have also started to address known issues proactively, like leading-edge blade erosion, so you will get those kind of learning benefits also in spite of it being a newer market with a less established supply chain. I'm still not sure you'll get the solar hockey-stick curve though. You will probably see something not totally dissimilar to what you've seen in onshore wind – more linear.

Moore, Orrick: The other part of the cost is the operational cost, and in the beginning all the financing parties are going to be concerned making sure they have appropriate warranties and protections that the projects are going to run. Developers are going to be looking at how they can avoid paying that premium to service providers, by doing it themselves to bring the costs down.

Summavielle, EDPR: Another part of the question that we need to take into account is whether the manufacturers are willing to share the efficiency gains they are having now. If they see that there is a lot of pres-

sure from the development side, they will not share this benefit easily. We need to see what is the trend of the market, because when we were able, as developers, to take a big advantage from this additional efficiency that was on the manufacturers' side, was when the demand decreased a lot. When the manufacturers were going through difficulties, they were open to sharing these efficiency gains. But we need them to develop bigger machines, not just because they can generate additional power but because the entire cost of the project will decrease, in terms of substructures, inter-array, permitting and leasing. According to the manufacturers I've talked to, they are already developing 10 MW, 12 MW and 14 MW.



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João Pedro Summavielle
EDP Renewables

McShea, NJBPU: For New Jersey, the localization of that supply chain in this first round solicitation is critical. It will essentially lay the foundation for future solicitation, to ensure cost efficiencies as we move forward. It's really on the developers to rationalize that relative to other development.

PFR: Do you think that financiers will also finance some factories here in the U.S., and will that cost also be included in the overall project cost? How will financing work if you have to localize your supply chain?

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Moore, Orrick: To take a slightly different angle, I think the equipment manufacturers have to see that there's going to be a lot of project growth. And if they see that, then they'll come and build plants to build the equipment, and then you can go from there. The problem is, because of all the issues that we're talking about—the tax incentives going down and the regulatory issues—at this point they're waiting to see where the market is going to go. It's going to be a huge investment for them as well, to build the plants there. If the pipeline is there, then there's a huge potential reward.

Remec, Fitch: And who do you think the first movers will be? Will they be the largest, established players, who might be seen as the most conservative as well, or would it be a smaller entity that's willing to roll the dice and be that first mover? Because there might be a pricing advantage to being that first supplier, right?

Rose, Barings: From a financing perspective, you'd want to go with a more established, proven technology name.

Thumma, Avangrid: And you're getting maintenance contracts spread out over so many different wind farms, so the economies of scale is just an advantage for the bigger players.

McNally, BlackRock: In answering that question I think you need to look at the lessons that have been learned elsewhere. For instance **Bard** in Germany developed their own turbine technology, and transmission technology, for a single offshore project. Maybe unsurprisingly, Bard no longer exists as a manufacturer, and the lender **Unicredit** became the owner of the project and had to pursue all the related intellectual property etc. I don't think anyone's going to be willing to take that kind of risk again now that there are some well-established options available in market.

Moore, Orrick: I think if other states could do what New Jersey's doing, and really open up the market, I think you'll have suppliers take a hard look at building facilities there.

PFR: On the solar side, did we see with the tariffs that any solar manufacturers wanted to locate facilities in the U.S.? I saw

some M&A deals, but I don't know if there were many newly constructed factories. With the wind space, the capacity seems so large that maybe Vestas or Siemens will say there's an economic story to be told here.

Zarnowiecki, Orrick: In some cases it's not an economic story that needs to be completely rewritten, it just needs to be modified. Existing facilities and infrastructure can be modified to accommodate a new offshore wind market.

“Long story short, you're going to have probably, on day one, a structure that does not rely so much on the tax equity take out.”

Remec, Fitch: It's really bigger turbines is what we're talking about, and so we're already building those, and the blades and the towers.

Summavielle, EDPR: But in terms of the offshore wind industry, it is not only about manufacturers, but also about substructures which play a key role in this industry. It can be even more difficult to define the adequate procurement strategy for the balance of plants than on the manufacturers' side.

Moore, Orrick: It's not all that different from the onshore development phase, with the PTCs only being out there for a short period of time, the manufacturers were only building a facility for a short-term gain.

PFR: That's a good place to move into the financing side of things, because the cost structure will have a huge bearing on how these giant projects actually get financed. How do you think the finance for Vineyard Wind or any of the other ones will get structured?

Camina, AllianzGI: When you start looking at financing offshore wind, you tend to overplay the importance of the tax equity portion of the capital, because we have been focusing on what tax equity wants for the last 10 years. It's kind of refreshing not to be having to focus

on that. And, full disclosure: Allianz has a dedicated tax equity team actively investing in U.S. renewables. I think there's going to be plenty of capital for this type of asset. The question is what is the risk allocation that the sponsors want. I think there's going to be a very clear cut-off in terms of lenders not taking permitting or development risk. There is no question a fully permitted project will get financing. There's going to be probably some friction though, potentially in the mismatch of capability. The lenders that finance offshore in Europe may not have the teams with such experience in U.S. or have expertise on what tax equity means in the U.S. But I would downplay the role that tax equity will have in a world with 12% ITC. It's still 12% of the capital cost plus the value of the depreciation, which is meaningful, and that, over very big capital numbers, is a big dollar value, but sponsors will find a way around that. The challenge is getting tax equity to commit upfront. The way onshore wind or solar is financed in the U.S., at the time of construction you get the construction loan and that loan is a bridge to two take outs—one is the term loan from the banks themselves, and the other is the tax equity that doesn't want to take construction risk.

I don't expect that to change, tax equity doesn't want to take the construction risk. What is different in offshore wind is the length of the construction. You have a construction period that's probably going to be, on paper, two-and-a-half-years; the reality could be extra years for large projects. So you have the problem that tax equity does not want to commit forward beyond one fiscal year, less so three fiscal years. It is very challenging to get that tax equity commitment in place, especially for an ITC deal that consumes so much capacity.

Long story short, you're going to have probably, on day one, a structure that does not rely so much on the tax equity take out. Are you going to get a mezzanine provider or are you going to do it yourself [as sponsor] because you're a deep pocket cash equity sponsor like Avangrid? Or maybe you can get the banks to do a “bridge to nowhere” – which we have seen. If the economics are there, there should be somebody willing to take those economics in three years and also someone to bridge it now. There's plenty of liquidity and even

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though I would like it to be the case, I don't think people will start financing the construction of offshore with an investment grade debt product.

PFR: Where do you think construction debt will price?

Camiaña, AllianzGI: That's a great question, we get the question a lot. What we saw in Europe is there's such a lack of pipeline on renewables in the onshore side that people are mispricing offshore. The pricing of the risk you are taking in the construction or operation, in general, is priced very aggressively in Europe. Why? Because there's nothing else.

Lenders have a mandate to do renewables, and offshore wind has been the only thing available in large volumes. I think pricing probably in the U.S. is going to be more efficient, meaning it's going to recognize some of the risks. These days construction pricing for onshore is quite competitive, say, 150, 175 basis points over LIBOR. There's going to be a relevant premium for offshore. Is 100 basis points enough? We'll see.

Rose, Barings: I agree. It's also about the quality of the contractual structure both during construction and operations. I think you can get to an investment grade rating if you have a fixed price, fully wrapped construction contract, a creditworthy offtaker, and a well-structured PPA.

Thumma, Avangrid: Is there some preference for the structure? There's three structures out there right now. There's Massachusetts, which is just 'PPAs with the utilities'. There's New Jersey, which is this OREC product where you're at least getting a fixed price, that's a long-term all-in price that everyone knows. And then you have New York, which has this hybrid where you're going to offer this unbundled REC price that's a fixed price and then the index REC. But the question is how does that affect the way you think about finance, and are there structures that are preferable in terms of what the ultimate cost is going to be to the project?

Remec, Fitch: It's all about price risk, right? To the extent you need to mitigate that price

risk, the length of that contract is very important. The regulatory stability behind the RECs is something that we spend a lot of time talking about. You mentioned there's several different types. Obviously the one that's fixed price for a fixed term with the state standing behind it is preferable, but as we've seen, sometimes those programs can change over time - they evolve.

I think a fixed price with a large utility is probably the most stable. Even there you have some risk, because you don't know long-term what the counterparty's going to look like. And then the RECs that are exposed to ongoing regulatory approval and some kind of price volatility around them are less preferred. The pure open market sales would be the least valuable.

Camiaña, AllianzGI: Looking at the onshore experience the U.S. has a great model, it's contract law. In most countries, the regulatory feed in tariff has been respected. But there's nothing that beats the contract law model - you contract with a utility. If that contract has been approved by the utility commission, it's a pass-through to the ratepayer. That's safe and everybody likes that.

We have seen state incentives going through challenges— for example Oklahoma who has a State PTC program, went through a moratorium. So anything that can be effected by a temporary change of mind is a concern.

Remec, Fitch: Complexity is cost. So the more difficult, the more nuance to any aspect of it, that's going to affect what the capital's going to cost.

McShea, NJBPU: I was just going to ask what you mean when you say RECs that are subject to ongoing regulatory approval. Because we perceive the OREC structure that we set up as being a 20-year fixed price OREC subject to the initial approval, and that being essentially a contract supported by a surcharge paid through the utility. So is that something that you see as risk and as being subject to ongoing regulatory approvals?

Remec, Fitch: That sounds like a very stable approach and construct but the devil's in the details. It really varies by state and by pro-

gram. If they're done appropriately to make sure that even with a change in administrations, through the election cycles, that they would withstand any kind of effort to diminish it in any way, well, then, we give it full credit. And you mentioned the Oklahoma PTC temporary moratorium. So who saw that coming? Something like that would be a bad thing.

Moore, Orrick: I agree with you that I think we've become very dependent on tax equity, and if they are around it's going to be a much smaller piece of the capital stack, and as you said, they are unlikely to predict their tax benefits three years in the future, and commit upfront. If they're there, the interesting thing is that that's going to change the dynamic significantly and give the lenders a lot more leverage over the tax equity than they had in prior deals, where you have lenders coming in as back leverage and the constant issue that you deal with is the tax equity say "the lenders are subordinated" and the lenders say, "We are only subordinated because of the tax structure". So from being a much smaller part of the capital structure, they are going to get pressure from sponsors and lenders on a lot of the features that they would normally insist on.

McNally, BlackRock: I do think the ITC structure gives tax equity investors a lot more comfort, though. The PTC is as-generated and there's an ongoing performance risk, whereas the ITC is mostly a day-one Capex analysis with the MACRS adder. I think that's an easier construct to monetize and manage associated risks around.

Remec, Fitch: Yes, just subject to the foreclosure risk that the lenders will worry about.

McNally, BlackRock: Right. But I do think that the influence of tax equity is going to diminish over time as the credits expire. You'll see things like mezzanine bridges, or provisions allowing for rolling tax equity closes as individual turbines, potentially, reach readiness, just as you might have seen in onshore in PTC expiration years.

Camiaña, AllianzGI: We should also talk about manufacturers and how they are going to be positioning themselves. Let's take a look at

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what was done in the past with Block Island. The tax equity investors were **GE** and **Citi** – GE back then was acquiring **Alstom**, the turbine provider for the project, and they wanted to put forward a commitment to make the project happen. That may be a tool that some of the manufacturers can use.

PFR: What have been the biggest financing lessons from Block Island? Between the covenants, the coverage ratios, etc., is there anything from that that you think will map on demonstrably to the offshore wind deals that we will see now?

Rose, Barings: I believe the market will use Europe as the template and leverage those lessons learned to put together covenant packages.

Summavielle, EDPR: I agree because European and Japanese banks were quite active on the European offshore financing since the beginning, they were able to understand the industry and to develop different solutions and overcome several difficulties throughout the time. Now they would be able, and they are aiming to, also put it in place here in the U.S. Block Island is a good example, where **SocGen** played a very important role proposing and making available an innovative structure to raise the pre-financing together with the long-term financing structure.

PFR: Do you think they will go out to 20 years? What do you think those sort of coverage ratios might actually look like?

Rose, Barings: There are longer-term offshore wind financings in Europe in which Barings has participated and they have been investment grade credit-rated. The first few deals in the U.S. may not be so long-dated from a debt tenor perspective, but gradually, over time – again, depending on the project contractual structure and the maturity of the market – you are likely to see longer-term financing available.

Summavielle, EDPR: In Europe we saw debt-to-equity ratios that were beginning at 50:50, and now we can see easily 80:20 or 70:30. And the U.S. will arrive there as well.



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Camiaña, AllianzGI: We can talk about ratios, but ratios over what? In onshore [wind] we are seeing manufacturers and suppliers enter into long-term fixed price O&M contracts that are full service. And that’s critical, because here is where your equity return as sponsor is going to change. Are you going to find suppliers that are established enough in the U.S. to achieve the scale and feel comfortable giving projects this level of certainty in O&M costs? In onshore sponsors are getting that.

Moore, Orrick: The other thing that plays into it is people. Given the size and newness of offshore projects generally, you’re only going to be looking at the big players. On onshore you have a lot of variance in size and you have some small operators out there which some people will take the risk on, but you’re never going to do that with offshore financing.

Camiaña, AllianzGI: I think that one of the biggest issues we’ll have in the first transactions is the incentive expiring next year, so all of a sudden we will have this rush to start construction. What does “construction” mean? Talk to your lawyer. But essentially, there’s going to be a lot of pressure to start financing projects next year and the history tells us that

offshore developers cannot underestimate the time and investment needed. Look how committed the Sponsors from Cape Wind and Block Island were to those projects. Lenders are going to get a lot of pressure to say, “Well, I’ve got all these permits, can you lend me money now?”

PFR: Jorge, let me put you on the spot. Where do you think long-term debt will be priced for offshore wind in the US?

Camiaña, AllianzGI: Our product is investment grade so by the time we get to the project it’s very de-risked. So how do we price it? Not surprisingly, we’re going to price it over the back of the offtaker. Right now, you look at the private placement market and they are pricing onshore in the area of 50 to 100 basis points over the utility offtaker for the project. That premium will probably add another 75 basis points over onshore to factor performance and interface risk.

McNally, BlackRock: We’ve talked about three different structures. They probably each have a different premium associated with the perceived risk of receipt of those dollars, but I think it’s a competitive financing market and

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it's a very constructive financing market. We were just talking about the SocGen structure and I expect that lenders will want to find ways to be supportive of good quality projects and deploy capital.

Pricing will also depend on what you want. If you want a construction bridge to nowhere that's at a premium. If you want construction debt that flips into term debt, maybe that term debt will have an initial premium because the project's doesn't have an operational history. If you want to get investment grade institutional debt and really squeeze as much juice out of it as you can, in an industry where you can potentially lock-in long-term Opex costs and operating margin, then that cost of debt potentially looks different again.

So there's no single answer, but I think the fact that we're all sitting here today suggests that there's a lot of interest and commitment to this space, and that's all a strong positive from a developer and economic return perspective.

PFR: I've been calling up everyone I know in the tax equity space and asking them they think of offshore wind and on one hand the reaction is very lukewarm. But on the other, there seem to be so many new investors in the tax equity space that those margins have been squeezed anyway. What have you been hearing from the tax equity investors?

Remec, Fitch: Some of them might be speaking a little bit more aggressively, but I think they're going to be very cautious for the issues that Jorge mentioned. They're not the most risk-prone people. If you look at it on the solar side, to get the ITC they have to invest early on and even that was hard for them to get comfortable with, because they liked the wind model when they come in after everything's tested and it's working. So most of the ones that I've talked to – and I haven't asked them recently – were always saying "I'm going to focus on the onshore".

PFR: Do you think that sponsors will be able to get back leverage on this?

Remec, Fitch: Whether it's offshore or just the changes in the capital structure because of the reduction in the tax credits, I think that

the bigger sponsors are going to be able to shift the leverage a little bit, but that's a little bit of crystal balling.

PFR: We've spoken about the debt side of things, but I'm curious on the equity as well. The kind of long-term owners of the equity in the assets, who are they and what are they saying at the moment?

McNally, BlackRock: There's a range of stakeholders that should want to be invested in these assets.

Infrastructure funds like our own are natural early-stage investors and long-term owners and partners. Utilities are also natural long-term owners and investment partners. State pension funds that want to invest in uncorrelated, cash yielding assets is another group.

No project, onshore or offshore, is perfect. There's always at least one issue—you hope it's just one issue that you can deal with. And I think these are inherently more complicated projects, so you want a sophisticated capital partner. Be it on the equity side or the debt side, you want someone who's going to be proactive and supportive about addressing issues, and not just saying "guarantee it, wrap it, insure it." I think you probably want to work with people that have some kind of track record in offshore, rather than just picking the investor with the biggest initial number that, once they come on board, requires you warehousing hundreds of millions of extra risk that you never thought you would, and that you haven't priced into your target returns.

Obviously the universe of buyers expands when assets are operational and de-risked. A long-dated creditworthy revenue stream with strong current cash yield should appeal to a wide range of institutional investors.

PFR: I did want to look at some of the interesting risks here. And just how good is the wind resource? How much credit do you give to the assessments of the independent engineers, and how does it compare to the wind that's available in the North Sea?

McNally, BlackRock: The advantage of offshore is that the wind resource itself is more

homogenous generally, but measurement is key, and I think as expensive as it is, having met masts is going to be important for these projects, because it just de-risks the project performance so materially. With these kinds of Capex numbers, a swing from P99 to P90 to P50 or anywhere in between means a difference of hundreds of millions of dollars if you're thinking about hundreds of megawatts.

Remec, Fitch: We find that generally offshore has a higher capacity factor than onshore, so you just have more steady wind and steady production, but it very much comes down to the specific location you're in. And the resource consultants themselves have improved overall. Just by virtue of the time



"The premium will probably grow by 75 basis points over onshore to factor in performance and interface risk."

Jorge Camiña
Allianz Global Investors

that these resource consultants have spent both onshore and offshore, the product itself has improved. There's more certainty in those forecasts but there's still going to be risk and volatility and you will have to be very comfortable that it was done correctly in order to finance around it.

McShea, NJBPU: We currently have over 500,000 acres of offshore wind lease area available. The shoreline is 130 miles, so that's the largest of any offshore wind state and that number may double when you add in the new BOEM leases. Being able to understand that wind resource and the variability over time, over space, is hugely important, not

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“Given the size and newness of offshore projects generally, you’re only going to be looking at the big players.”

Chris Moore,
Orrick, Herrington & Sutcliffe

just to development and to understanding the revenue, also to integration and to PJM. Because at the end of the day that’s where you get paid. We have invested over the past ten years in the development of an offshore wind model that couples both the ocean data and the atmospheric data and this utilizes a grid of virtual met towers to alleviate the need of a single met tower.

Rose, Barings: I think it also depends on where projects are built. If you have a number of projects in close proximity there is potential for wake impact.

Remec, Fitch: External waking is something you really can’t control, and to some extent the lessor can provide some certainty around that by guaranteeing a certain distance between the different developments, if we ever get to that level where they’re competing for the same land...

Moore, Orrick: Good problem to have.

PFR: Do you see manufacturers and EPCs providing financing of any kind?

Moore, Orrick: I wouldn’t expect it from the EPCs, but I was wondering about the manufacturers. We’ve certainly seen them do tax equity and debt on the onshore side to encourage people buying their turbines. I’ve seen **Siemens** do loans to try and get a particular

developer— that uses both Siemens and GE — so I could see them doing that, to the extent they’re financially capable.

Rose, Barings: I’ve also been reading about the technology, in Europe especially. The deeper you go with monopiles, it’s questionable whether those are the right structures to put the turbine on. Floating structures are now being tested in Europe, and in places like California where it’s deeper water, that may be more appropriate.

Moore, Orrick: Any foundations are just going to add to the technological risk, in a sense, although California is trying to get that.

McNally, BlackRock: That’s very much on the unproven end of the spectrum. It’s all evolutionary, and no one’s going to show up on day one with a perfect solution for floating.

Moore, Orrick: But it’s going to be hard to have a brand new turbine and a brand new foundation system, a floating system.

Zarnowiecki, Orrick: I think the technology race on the floating turbines is ongoing to develop the best floating technologies, and that technology will be what is deployed in California and Hawaii. There are spots on the Great Lakes that potentially can utilize a floating turbine technology. And from a global perspective that’s an important part of the offshore wind sector.

Summavielle, EDPR There are some floating technologies that are already in a quite advanced stage of development with the first pre-commercial projects coming out, namely EDPR is building a 24MW project in Europe (Portugal) based on **Principal Power** technology and has been awarded in France to build another one with the same technology. Moreover the project being built in Portugal has recently achieved financial close.

McNally, BlackRock: Offshore wind is tangible, it’s real, it’s happening and that’s phenomenal for the U.S. and for the industry. When you think about Europe, which has higher power price markets to start with, offshore represents a kind of avenue for energy independence given they’re so much more reliant on

imported fuels from neighbor states. That’s less of a consideration now in the US, so the more complex these projects and RFPs get, you really need to look at whether or not the relative value analysis makes sense. Is your generation profile advantageous versus your load profile in the north-eastern corridor for instance? Probably, if you assume winter peak loads and winter resource peaks then that’s a nice fit. This can’t become a red vs. blue issue, it needs to be an LCOE [levelized cost of energy] issue. We’re finally past that narrative in renewables more broadly, having demonstrated cost unsubsidized competitiveness, which is why over the last five years they’ve been over 50% of new generation capacity additions annually. Renewables belong on-grid as part of a balanced clean generation mix. Let’s not get sucked back into a ‘subsidy’ narrative for offshore, and let’s not end up in a situation where we have a couple of projects and years later everyone is saying, “Do you remember when we tried doing offshore?” We will all benefit from a purely objective factual cost-benefit



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Anne Marie McShea
New Jersey Board of Public Utilities

analysis that in turn produces great projects that deliver value for states, stakeholders, off-takers, and consumers. We need to collectively make sure it happens. I think we all have a responsibility to make sure that the industry evolves, and does actually materialize, and that we are proactive and engaged partners on the financing and development side. ■