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# EDITED TRANSCRIPT

- The Offshore Playing Field and Vattenfall's Competitive Position

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## CORPORATE PARTICIPANTS

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## PRESENTATION

**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

Welcome everyone to this Vattenfall audiocast for analysts and investors on the topic of Offshore Wind.

My name is Johan Sahlqvist, Head of Investor Relations.

And together with me today I have Gunnar Groebler, Head of Business Area Wind.

Warm welcome to you Gunnar? And thank you for taking the time today.

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

Thank you very much.

And a warm welcome also to the audience.

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

Gunnar, a week ago we spent a day in London meeting with people from both the buy-side and the sell-side to address this topic and the background is of course that over the past couple of years we've seen a significant reduction in the bidding levels in offshore wind.

And I guess for an outsider it's quite difficult to understand the drivers of this development and the consequences.

Now Vattenfall has of course been successful in recent auctions and received very positive feedback from the meeting in London.

Any reflections from your side?

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

Actually, I thought it was a very good meeting or actually it was three different sessions that we had there, very positive, very engaged discussions both from the sell-side and the buy-side.

And what I experienced is a lot of interest, a lot of good questions and good discussions there.

So, I very much appreciated these sessions in London.

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

Yes, great.

Well the idea with this audiocast now is to make our story available for a wide audience.



We uploaded the slide pack to our website in connection with the meeting and I will now simply hand over the word to you Gunnar to guide us through the materials?

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

Well thank you very much.

Yes, the purpose is to run you all through that slide deck touching upon our position as Vattenfall, how the offshore wind industry as such looks like and what kind of development we see. And then perhaps shortly also touch upon the regulatory developments.

If we move on to slide number 3 that illustrates how we are positioned as Vattenfall Wind Power in the overall sector.

What you can see here is that we have accelerated our growth since 2013, 2014 both on the existing side meaning net sales and EBITDA but also on the investment side now peaking in 2015 with SEK 8.6 billion for that year only and this trend will then also continue.

This picture shows that we are a clear number two when it comes to offshore wind in the northwestern Europe space and we have also strengthened our pipeline a lot through the year 2016.

Just to mention two things, we have bought two projects in Germany to participate in the tenders one being Global Tech II and Atlantis I.

So that underlines our ambition also to remain in the offshore wind sector and remain there successfully.

When it comes to track record, worth to mention that we have completed - just these days our Sandbank project, 3 1/2 months ahead of schedule and well within budget, I think that underlines that we have a strong track record to further build on.

And this only works with an excellent team. I'm very proud of saying that we have a very experienced and excellent team managing both the projects also the existing assets and continue to drive down cost on those as well.

As well also engage more and more with the suppliers. Having a close supplier collaboration is very important especially when looking ahead to the new projects.

So, I think that shows where we stand when it comes to Vattenfall Wind Power.

It is worth to mention that the growth will continue and this is underlined also with the investment plan which is SEK 15 billion for the year 2016-2017.

In total, we have said in 2015 - that we're going to spend some EUR 5 billion so SEK 50 billion until end of this decade.

Looking on slide number 4 on the portfolio, what you see here is that we have a good balance when it comes to onshore and offshore as of today.

This will change over time just because the offshore projects are much bigger than onshore projects.

We will remain focused also on onshore for sure but then sort of this ratio will just sort of gradually move more towards offshore just due to size.

What you also see on the map is the geographical footprint and worth to mention and to highlight here is that we have one strategy which is looking into clusters.

So, you see in the southeast of UK you see the so-called Ramsgate cluster with Thanet, Kentish Flats, Kentish Flats Extension being operational and our project Thanet Extension that we work on right now.



Why do we do those clusters? Why do we think in clusters?

Because we see benefits and synergies running a cluster, as you can imagine running them from one - just one service harbor utilizing vessels, utilizing - so the whole infrastructure in the harbor for more than just one park is beneficial and helps us to reduce cost also for operating assets.

Another cluster I would like to mention is the one in the North Sea, at the German-Danish border including DanTysk, Horns Rev 1 operational and then Sandbank as I just said just completed and almost completely up and running as a project.

Sandbank Plus a project for the German auctions and then Horns Rev 3 as a project in the vicinity also of Esbjerg so we have another cluster here.

Moving on to slide number 5.

That gives a bit of an overview of where we come from, our offshore wind journey.

As you can see we have constantly worked on our pipeline, constantly worked on our existing asset base starting in 2006 with Horns Rev 1, Utgrunden, Kentish Flats.

Now moving into 2016 with the inauguration of Kentish Flats Extension and as I said moving into 2017 then with Sandbank and the rest of the pipeline then to come in the later years.

This will allow us to double our portfolio compared to 2015 by 2020, moving to 4 gigawatts and we have the ambition and also the pipeline, we're going to get there in a second, to then operate at least 7 gigawatts by 2025; that's the ambition.

There we have in terms of installed capacity and this will only happen and we will only be successful if we fully focus on the levelized energy cost.

So, our ambition is to lead really the industry when it comes to levelized energy cost reduction with the ultimate goal to then be able to deliver renewable energy independent of any subsidy scheme.

My personal belief is that the wind industry has to move into that direction in order also to keep the credibility that we have been able to build up both with politicians but also with the wider society.

So, striving for an independence from subsidy schemes is something that we are working on very hard and every day.

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

A question there Gunnar?

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

Yes?

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

Is it fair to say that offshore wind is now gaining traction in getting sort of a front runner role in comparison to onshore and solar in this respect when we talk about the cost development?



**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

Well I think what is fair to say is that we've been able to catch up very much with both onshore and solar PV. We have been able to reduce the levelized cost of energy, if you compare Horns Rev 3 with Danish Kriegers Flak, in just 15 or 18 months we have been able to reduce the levelized cost of energy by roughly 50 percent, even a bit more than 50 percent that indicates I would say very much that we are really focused on that.

And then that there is quite some cost reduction potential through learning and other levers that we are going to get to during the audiocast.

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

Yes.

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

So, we said we're going to - I'm looking at slide number 6 now.

We said we want to double our portfolio until 2020 and then further grow to 7 gigawatts until 2025.

What the list of projects indicate is that this is a realistic target for Vattenfall and that the project pipeline at least supports that target.

What you see in the upper part is what we have in operation, the 1.3 gigawatts of installed capacity.

Then we have already today roughly 800 megawatts under construction.

You see Sandbank, Aberdeen and Horns Rev 3 here. Aberdeen is sort of in full swing and Horns Rev 3 is ramping up and will then move into offshore construction also this year.

So, we're well on track with those three projects.

And then we have a further pipeline and this pipeline only looks at projects that we actually own and so are not additional tenders that are centrally organized like the ones in the Netherlands; those projects we own and those projects we are actually working on to either prepare for tender or then move them into tender at a later stage.

And then obviously, we have the two upper parts in this development bucket, Danish Near Shore, Danish Kriegers Flak, where we actually have a concession already signed and have won the tender, that we now move to a final investment decision then within short.

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

Yes, yes. So the main focus for the year now in 2017 looking forward?

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

Main focus for 2017 is a different dimension to that.

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

Yes.

**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

I think keeping full focus on those that are under construction; to be able to also deliver on the promise that we made with a certain support scheme level that we had to win Horns Rev 3; deliver the two Danish projects to final investment decision, that includes the whole procurement part.

We have not signed any procurement contracts for those. We are in discussions there with the supply-side so moving them to a final investment decision including the procurement.

And for the others well there's a participation in tenders. We have the German tender on the 1st of April and then we obviously have the CFD rounds in the UK and we're preparing for that.

Parallel to that we are also looking at the centrally organized auction in the Netherlands like Hollandse Kust South that is then due sometime in autumn this year.

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

Right.

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

So, the plate is full.

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

Okay, great. Just an additional question here. I mean if you look at this list of course, a comprehensive list of projects and one might wonder are we sort of running out of the best sites now in offshore or how do you see that?

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

No, I don't think we are running out of the best sites in offshore.

There are a couple of studies that have been made by independent researchers on the wind potential both in the North Sea but also in the Baltics and if you put all of this together I think there are ample opportunities to further grow that business.

Also, at spots that deliver both sort of decent water depth and good soil conditions and also good winds.

So, I don't fear that we are running out of good sites for future projects, no.

Looking at page number 7.

There I tried to summarize why offshore wind actually fits within the overall scope of Vattenfall.

I think you all are aware of the fact that Vattenfall as such is transforming right now and clearly on the asset portfolio, on the production portfolio we have divested our entire lignite business in 2016.

And we are shifting the entire energy production portfolio into a CO2 free portfolio going forward and in order to grow that quickly, offshore wind fits extremely well because we're talking big sites, we're talking sort of relatively fast ramp-up that we can accomplish here.

So, that really supports this portfolio transformation of Vattenfall.

Secondly the dominant part of growth when it comes to offshore happens where we have our core markets.

We're talking everything around the North Sea and the Baltics, that's where we are present already so we have a very good regional fit and we know sort of the markets, we know the whole sort of political arena around that so that makes a lot of sense from that perspective as well.

Thirdly also from a cash flow perspective offshore wind is of interest.

We see high level of de-risk cash flows through support schemes - well basically in all support regimes that we have, we have de-risking elements on the cash flows so that delivers predictability on the cash flows and is then certainly something that we also appreciate from an overall Group balance sheet perspective.

Profitability is still high, yes.

We look at very good IRRs for both the existing fleet but also for projects that we recently won and projects that we go for in the future.

So clearly, we have a focus on profitability which I would say comes first prior to volume, prior to growing for the sake of growing.

But we also see that given the tougher environment, given the pressure on the levelized cost of energy and the move from basically all countries into auction system, this will lead to further consolidation on the development side and might lead to opportunities to grow the own project pipeline.

Last but not least, offshore fits our DNA as I would call it within Vattenfall.

We're talking about projects that are very capex intensive and very complex, things we have done in Vattenfall in different technologies since, I think since the Company exists.

If you look at hydro, if you look at nuclear, if you look at also the experience we made in lignite is all - always high capex, high complexity both on the construction side but also on the operational side and that fits very well to also to offshore wind.

So, I think from that perspective is also a very good fit for us and we see some competitive advantage there compared to other players that might enter this business as a newcomer.

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

So, on the return because of course this has been a key question for us in IR from investors.

And can we say anything more about the IRR or the return of these latest projects in particular?

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

Yes.

Looking at the decline of the levelized cost of energy or the levelized energy revenues as you can see on page number 8, that question is an obvious question, right?

And we discussed it last week as well.



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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

Yes.

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

Let me just reiterate here that we have a clear focus on profitability - and that is higher than the growth in volume.

And those projects as I said they are complex projects, they still require a certain IRR to be profitable and on the safe side and this is clearly what we strive for.

On the other hand, we also see that now we're talking second and third generation of offshore wind farms so we also have a bit of a reduced risk profile in those projects.

We have had learnings in the first generation some of them were painful, some of them were very good and those we naturally incorporate also in the second and the third generation of offshore wind farms.

So, but if you look at our perspective we still aim for an industry standard return on those assets.

And then perhaps to elaborate more on that because that is then the obvious question, what is an industry return on such an asset.

Also that - we discussed last week and our view is that you can easily build this bottom-up by looking at how post-construction projects and operational projects have been traded in the market the last six, nine, months and then you have to add at least a certain [EPCI] margin on top of that and then also sort of the development premium and then you get to what the industry standard margin will be for such a project.

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

Yes. And looking forward, I mean, for how long can this continue because if you look at this slide here, number eight, it sort of looks like an inverted exponential development?

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

But you also see that this curve is flattening out a bit. Yet still you see dramatic development since 2015 to - with the Horns Rev 3 to Kriegers Flak.

What I see here is a, I would say the normal development of a quickly maturing industry.

So, cost levels are coming down and the risk levels are coming down.

Does that sort of continue at the same speed forever?

For sure, not.

So, there will be a flattening out of that cost curve and from what I see today I think we are at the level where this curve will remain stable until we see the next sort of technological development that then would also lead to a further cost saving, hence improvement on the decreasing revenue levels.





**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

And if you compare us to other leading developers and also in relation to the financial players, what is the competitive edge of Vattenfall?

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

Well I think we have embraced the whole question around tenders from the very first day.

So, we got acquainted with the need of being competitive very early.

We have engaged with suppliers to fully understand technology and also be able to make our own assessment on how we could improve.

Also not only from a sort of let's say from a turbine perspective but look at the wind farm more from a holistic view, optimize the design, optimize the siting, reduce the so-called "Wake-Effects" or shadowing effects from turbines and also have a strong focus on O&M, take all the learnings from the operational assets.

And we shouldn't forget Vattenfall today operates more than 1,100 turbines so there's quite some potential to learn and feed that into the early development of such a project to really be very competitive when it comes to the O&M set up, that helps a lot also then to be able to bid on the levels that we did.

And in addition to that and that refers also to the very first slide, we tried to stay lean as an organization.

I don't want to blow-up the organization with a lot of people, I would like to stay lean and to enhance agile because that also allows us to do things slightly different than we have done last time, adapt to the changing market, I think that's also an advantage that we have.

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

And looking again at these latest tenders, I mean because of course only in six months here, there has been quite a dramatic development.

Could you elaborate on that, what has happened?

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

I think to answer that question is fair to look at slide number 9 and there you'll find parts of that answer.

I think three elements that we mentioned here are clearly a cost driver or a driver for cost reduction.

First of all, larger turbines.

As we speak we finalized the installation of Sandbank. This is a 4-megawatt turbine. In the same year that we finalize Sandbank we will start installing 8-megawatt turbines on Horns Rev 3.

So, that tells you how quickly also that turbine industry has changed and has developed and then it's not only the bigger turbine that has then knock-on effects.

You need less resources when it comes to foundations, when it comes to the whole installation process because the installation vessels are not needed the same amount of time than for smaller turbines on a sort of similar-sized project.



You reduce the construction periods, hence you reduce also the weather risks while doing construction.

And also, as you can imagine it reduces the O&M because an 8-megawatt turbine does not require the same amount of O&M than two 4 megawatt turbines.

So, that's clearly on the larger turbines.

What you also recognize is that parks are getting bigger, yes. Sandbank is 288 megawatts and then Kriegers Flak moves up to more than double the size so you have synergy effects there, you have learning effects when installing and when operating and you can optimize through the size of the park.

And the third element and I mentioned that before is the clustering of assets. We can really optimize around the O&M, create a lot of operational efficiency there.

In this particular cluster around DanTysk and Sandbank we have the offshore accommodation platform so we also reduce the sailing time of service technicians to get to work every morning or get back in the afternoon through the accommodation platform which is located right at the DanTysk site.

And then all the sort of the other side effects when it comes to spare part management and as I said before taking in lessons learned from earlier projects is very much supporting our cost reduction curve and it contributes to those bids that we have been able to place last year.

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**Johan Sahlqvist** - Vattenfall AB - Head of Investor Relations

Yes.

And location as such, and the site specifics, how important is that for return I mean?

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**Gunnar Groebler** - Vattenfall AB - Head of Business Area Wind

Well obviously, it is important.

Just to give you an example, here Kriegers Flak, is in the Baltic Sea so shallower water but still very, very good winds. So almost the same level that we've seen in the North Sea but with a bigger windfarm and as I said shallower waters it is a very good site and enabled us to place that low bid, even compared to Danish Near Shore where you say well, that is closer to shore, yes it is, but Danish Near Shore actually is two sites so you have a bit of disadvantage there when it comes to size and then also when operating the site.

So, you have site specifics that also sort of underline cost levels, yes, absolutely.

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**Johan Sahlqvist** - Vattenfall AB - Head of Investor Relations

And in terms of technological development, to what extent is that factored in into the bids and are we sort of assuming a certain development there?



**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

Well, obviously, we are looking at technology development and do assess what kind of technical development do suppliers foresee; how do we then assess it from a technical feasibility so we have engineering capacities in-house to really scrutinize what suppliers actually promote that helps us to get certainty on certain bid levels.

And then for sure we also have to do assumptions. Just to pick an example, if you take the German tenders that are due this year and next year, those tenders partly will only be realized in 2024, 2025.

So, you have to do a projection basically today on something that will be delivered in seven years, down the road. And one thing is very sure, you won't be able to build that on an 8-megawatt platform because you won't be able to buy an 8-megawatt turbine at that time.

I think then technology development has moved on and you won't get an 8-megawatt platform, at least not those that are available today.

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**Johan Sahlgvist** - *Vattenfall AB - Head of Investor Relations*

Yes, but say that if we would be wrong, what happens then, if the technology is not there, at that point in time what sort of safety do we have?

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

Well there are two sort of lines of defense if you want to call it that way.

First of all, winning a tender doesn't necessarily mean that you ultimately have to build the project at any sort of economic level.

You're placing a so-called bid-bond when winning the tender and that bid bond would be at risk if you decide not to build it.

That's sort of one line of defense.

Obviously, that would be a very sort of - would have a negative impact not only on your own company but on the entire industry.

But that is at least one opportunity if technology development sort of goes in completely the wrong direction or we did a wrong assumption here.

The second one and this is something we have seen in the market quite broadly is that you agree with the turbine supplier on a certain sort of turbine specification to be delivered at the point when the project is to be constructed.

If for whatever reason that is not possible because the turbine supplier cannot deliver then you normally agree on then the latest available technology and then you basically have a commercial discussion on the delta between the latest available technology and the technology you thought you would have for that project.

So, that is one half of the second sort of line of defense.

And the second half of that line of defense is that you have competition.

You have growing competition also on the supply-side and that also helps you to then mitigate the technology risks, right.

Okay?

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

Yes.

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

Good.

What we try to do on page number 10 is to illustrate how rapid and how radical the change in the industry actually is.

As I said we just have completed Sandbank. We are now commissioning the last 10 turbines there whilst we are preparing to go offshore with the project Horns Rev 3.

And then if you look at the very right and the delta numbers here, it clearly indicates this rapid and dramatic change that you see.

The turbine size has more than doubled, even though Horns Rev 3 is substantially bigger than Sandbank we need much fewer locations, right?

The rotor diameter, hence the swept area has increased by 60 percent and if you just imagine that the swept area actually indicates how much wind, how much energy from the wind you can harvest and transform into electricity, that is an amazing sort of - amount that you can - additional swept area that you have through the bigger rotor diameter.

Yes, and then a sort of site-specific thing here is the distance to shore where Horns Rev 3 is much closer to shore than Sandbank, that's also the reason why we work with the offshore accommodation platform in Sandbank and DanTysk rather than what we do in Horns Rev where we then sort of commute from a harbor.

So, it just indicates how dramatic really the change is and how much we could achieve through just a couple of years.

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

Yes, and coming back to the cost structure, could you give us an indication of a typical project and the cost breakdown in terms of turbines, development cost, O&M, capex, et cetera?

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

Yes, if you look at the total cost volume that we have in a project, I would say roughly 5 percent is the cost that you have on the development side so prior to taking the final investment decision.

And on the backend on the O&M it's roughly 25 percent that you have there.

The rest is then the capex, the rest is the investment that you have to take in order to build the wind farm.

And then if you take the capex and take that as 100 percent, roughly two-third of that is the turbine, as of today.

So that tells you also how important sort of the turbine is in the overall scheme of that investment.

Okay?



Yes, on page 11 we sort of summarize again sort of why Danish Kriegers Flak came out on the level that it came out and what sort of the specific economics are for that project.

As I said it's an attractive site with high wind comparable to the North Sea even though it's Baltics. It's a big site with 600 megawatts.

And then I think one additional factor I haven't mentioned yet, is that you have to really understand the support scheme that is offered by the specific country.

In this case, the Danish government offered a support scheme for the first 50,000 full-load hours which then translates into roughly 11 years of operation instead of what you see in other markets, a defined timeframe.

And then the value of unavailability or of availability is slightly different.

To explain that, if you are unavailable in the Danish system in those first 11 years then you would still get the support scheme but just in the later year so you only have the loss in the time value of money.

Whereas in the Netherlands well if you are unavailable in the first 15 years, then sort of that revenue stream is gone for the time of unavailability.

So, really understanding that and building that into your business case is key also to get to those levels.

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

And the assumed turbine size here in Kriegers Flak?

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

Well we have not decided. We are right now in the discussion with the suppliers, what can be delivered at that time when Danish Kriegers Flak is due.

Perhaps, in that sense, also important that we have a long installation window so we have a given timeframe of three years to install the entire project. That also allows us to play a bit with when is a certain turbine type available and then move the project into that sort of availability slot.

That's exactly the discussion we are having right now with suppliers and then we will optimize the whole scheme around that.

But it's not yet set what kind of turbine we're going to look at.

Well, obviously, it's going to be north of 8 megawatts.

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

Yes, and with regards to the increase in turbine size, is that something that you see is pushing the project risks?

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

Not necessarily, no.

Given that we have a very experienced engineering team we do very thorough technical due diligence on all the platforms we are looking at.



So, prior to engaging really with a supplier on a specific platform we have done our homework on the technical due diligence hence we can also assess what kind of risk there is from a new platform and we will not see a highly, increased risk by adding a new platform.

So, I don't really see that, no.

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

Okay and how certain are we about these technological developments until say - I guess it's - is it 2021 in the case of Kriegers Flak?

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

Yes, yes.

Well I think - given the interaction that we have with suppliers we try to understand where they want to move towards to and we are very close in that discussion and also give input to what kind of turbine we see would optimally fit to a certain site.

And then we try to sort of get to meaningful solutions, well, obviously, the supplier in the end has to decide - they have to decide themselves what they want to do but we can at least give some input.

And by having those discussions we are pretty comfortable to understand where those suppliers will move towards and then model that into our business case and also then support the suppliers and really getting there.

Okay.

Perhaps to look at the regulatory regimes all over Europe.

It's fair to say that we are moving more and more into market-oriented regulatory regimes.

We now see Germany moving into an auction model and now with two years of a bit of an interim auction where you have to bring your projects to that auction and afterwards move into a centralized auction where then the government would propose the projects.

They also have delivered a sort of an outlook on what the volume will be which I think is also very helpful not only for us but also for the supply side so that they see how many turbines, what kind of volume will come to the market; that also gives a bit of certainty.

So, in all markets that actually are active in offshore right now things are moving towards more market-oriented support scheme models.

And having that market orientation will sort of increase the competitive pressure on us as developers and operators and will also lead to a further scrutiny on costs in order to remain competitive.

There are still some differences though.

As I said, central versus decentral; central model is Denmark and the Netherlands where sort of the government is developing the projects, decentral is then rather the UK model with the CFD where you have to bring your project; and the German interim solution where you also have to bring your [project].

Prequalification is another topic in the central model which I think is quite valuable to at least think through.

We see a prequalification process in Denmark whereas the Dutch model does not require prequalification that broaden the opportunity for people entering the market but it also increases the risk that people that not fully understand the mechanics of such a project shoot too low and then by that hurt themselves or harm themselves but also the industry on a reputational basis.

But both are working.

Important is also to understand what is the lead time between the bid and commissioning.

As I said earlier in Germany it is a very long lead time now bidding in 2017 for something that will materialize in 2024. That adds risks to your business case.

Nobody knows what interest rates will be. You have to have an assumption on steel prices and other commodity prices, et cetera, so how to factor that into your bid is for sure something a lot of people will think deeply about in order to then also limit or cap the risk that you take with such a bid.

Yes, then sort of fixed bidding level versus marketing responsibility plus premium.

I think the more and more this market will mature and you see the push also from EU, it will push the marketing responsibility on the operator which I think is also a sign of maturity so I wouldn't have a problem with that.

That we then also ultimately on a mid-to long-term move away from fixed fee then to a more market-based model.

So, I think all of that as we say on the bottom, results in strong competition and it will continue to be strong competition and we see new players coming in like Shell now in the Netherlands and it will also continue to have a focus then on cost reduction.

Which then ultimately leads to what I said in the beginning, my belief that we have to drive that industry to independence of support schemes.

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

And in relation to other factors, how important is competition for driving down cost levels would you say?

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

I believe this is one of the biggest drivers that you have in order to really get cost level down, if you have a fixed fee and a known fixed fee then everybody will sort of price themselves in with their margin so that sort of everybody is happy.

But as soon as you have competition then all of a sudden, this mechanism doesn't work anymore and you really have to scrutinize not only yourself but also your suppliers and the sub-suppliers in order to then to live up to a really, competitive and sharp project.

Perhaps summing up on page number 13.

We believe we are successful and remain successful in the offshore wind sector.

And there are three reasons why we think we will remain to be successful there.

As I mentioned earlier, supply-chain interaction is something where we see high value in, really being amongst those that understand and have the ability to technically assess technology and development is something where we feel very comfortable in.

And something I haven't mentioned yet is now given that we have a certain portfolio of projects, we looked at this earlier, we can also approach the market with a portfolio approach rather than with just a single project.

So, the market also knows that we are here to stay and we are here to further grow and might have a different view on us than before where we only went to the market with distinct projects.

This portfolio focus is also something that helps us internally, getting the learning curve from earlier, through earlier projects and findings on what we can actually improve and feed that in very early in the development process and in the bidding process, helps us to create some advantage.

And the portfolio focus also helps us in optimizing the deployment of resources both people but also capital to the different projects in the different stages.

And last but not least, we have worked a lot on O&M. We are continuously working on O&M; Digitalization helps us a lot, really understanding the - down to the component level, failure rates and how to ensure that we reduce unplanned maintenance which especially offshore is very, very expensive and take the learnings from scrutinizing our data coming from existing turbines and feed that back into O&M processes, brings quite some advantage.

And then again having more than 1,100 turbines up and running provides you with a hell of a lot of data that we're now sort of using also to optimize on that end.

All in all, I think we are well-positioned.

We are well-positioned in the offshore sector and we are well-positioned also to take a lead in future offshore industry development.

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

And regards to sort of our core competencies here, where does that lie and to what extent do we outsource certain parts of the project?

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

Yes, that's a very relevant question.

And given that the market is developing, it's something that we review on a regular basis, where are we best positioned in the value chain and where should we actually not be in the value chain anymore and leave it to the market to solve that piece of that value chain.

What we see right now is having the technical competence to assess certain technologies is the key.

For sure we will not enter the market of building turbines or building foundations ourselves.

We have an opinion on how a foundation should look like but we're not going to weld steel here to make our own foundations.

So that is for sure not what we're going to do.

Same goes for the O&M, having a clear view on how O&M should be performed and what to focus on - now getting back to for example digitalisation and use that data to be very specific on what has to be done is clearly key competence for us then sort of the actual doing of plant maintenance might not be in scope on the long run at least.



I think it's good to have that experience and we are ramping up sort of competence there but we also see third-party suppliers moving into that space and then we have to see who is actually then better performing that job and then we will take perhaps new decisions.

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

And could the collaboration with the supplier take the form of a joint venture or a similar?

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

Well, we have not moved into that direction to go into a joint venture or go into sort of exclusivity with a supplier.

So far, we believe and we have observed that having competitiveness also amongst the suppliers is more beneficial to us and more beneficial to us also with the projection on future tenders.

So, we have not envisaged to move into that direction.

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

In regards to the growth strategy, are we going forward considering sort of building and selling-down the capital recycling concept?

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

Yes, and as you can see in one of the later slides, we have an overview of kind of partnerships that we have pursued so far.

So yes, we have worked with partnerships. We have - especially in the last years worked with financial partners or financial investors as partners.

But given that the overall Company has stabilized and we have been able to remove some of the sort of obstacles from an overall company perspective last year, this has strengthened our balance sheet and given that we don't do project financing but finance it all through our own balance sheet, we right now see less of a need to recycle capital in order to provide the head-room for the growth.

But obviously, there's an opportunity. There's always sort of an option for us to go down that route in order then to enable the future growth.

Right now, I would say it's less of an issue for us than it has been perhaps one and a half years ago.

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**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

Okay.

This ends our audio cast for today.

Many thanks Gunnar for taking the time.

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**Gunnar Groebler** - *Vattenfall AB - Head of Business Area Wind*

My pleasure.



**Johan Sahlqvist** - *Vattenfall AB - Head of Investor Relations*

And thank you everyone for listening in.

And also with any follow-up questions, you are welcome to contact us at Investor Relations.

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