**P1 - Interview NamPower, Windhoek - 7-2-2023**

The biomass power project manager, but essentially I'm a senior engineer here at Nampower, so I work across many projects, but specifically I'm the project manager for the biomass project. So yes, I'm a mechanical engineer by profession. I also have a background in terms of energy management and also from the consulting background, and I think I've moved to numbal about 2018, yeah. So been working on. It for about five years now.

I guess the floor is yours.

**So what, what is the yeah, so you said about biomass power and you also did, can you tell us about that, that project and what it is and what are the challenges you face down the line?**

**Because this is of a value chain which is. Quite relative, if not the exact same. You can see. The biomass supply and everything, it's still the same. And yeah, in what way? You are harvesting the biomass in what form? So on and so forth.**

OK, so our project is still under development, so it's not, it's not, it's not off the ground yet. So basically they started the pre feasibility in 2013 where they first started looking at the possibility of biomass to electricity there after.

**OK, so that's OK.**

It went to the feasibility stage, so I think the feasibility started in about 2015, 2016 where we did the environmental impact assessments. We did our resource studies. We also did the technical feasibility that was funded by the European Investment Bank. I think the initial pre feasibility. Funded by KF W and we started doing the full project development. So let's say after the feasibility stage in 28. When the Minister of Mines and Energy gave a determination for 220 megawatts, of which the biomass power plant was considered, one of those power plants that were to be built. So at this moment in time, we busy finalizing. Our procurement activities so. We've done all of the studies, sort of, the geotechnical studies, the transmission studies and we are really now in the final sort of implementation phase. So we had bids that closed on the 30th of September to build the power station. Those are under evaluation and then we also had bids that close to supply fuel to the power. Station November last year. So those are also on the evaluation and I think the biggest challenge for the there's two major challenges the first one. First of all is just the cost of the technology, the biomass power station is significantly cheaper, so more expensive than solar or wind and so forth. And although it provides base load to some extent, there are still much cheaper alternatives in terms of energy supply, so as much as it's a nice. Project to help solve. One of, let's say Namibia's other problems. It's just one of those problems where it would be sort of the electricity consumers potentially subsidizing agricultural. The agricultural sector, so it's really an expensive technology. So we undertook or we're trying to find ways to sort of make the technology more affordable. We sought out grants, we. The final stages of trying to secure a grant from the Numma facility, I think they've named out the Mitigation Action Fund, so that's for about €25 billion. This is public information. You can go on their website and the idea then was to hopefully reduce the tariff on the, the actual power station to the consumer. But also to help build up the harvesting industry, which I think was built up quite nicely by our own cement, but in order to make biomass viable? We needed large scale, so from the sort of the industry at the moment, we believe it could potentially be upscaled to what we needed, but there will still be a lot of capacity building required to bring on new contractors and make sure that we can get sufficient fuel so.

**OK.**

The biggest challenge we face is just the cost of the technology, the cost of the bringing the fuel to the power station and the fact that there's other cheaper alternative. So we have to try to find almost every possible Ave. You know, carbon credits, grants, subsidies just to get the plant going to sort of prove the concept. So the main aim at the moment is to try to beat the input prices that we that we obviously get from the neighboring countries and even they it's a little bit of a struggle to reach parity, but the second you can at least beat your import contracts. Then they're likely that you will be dispatched so the project still faces a lot of challenges even after this procurement phase. So the economics need to make sense or it needs to be a political decision. That look, this plant will proceed, but otherwise it's, I would say the costs of the main hurdle that we have to overcome, not necessarily the technology or even the harvesting.

**And just to understand that numbers, can you let us know like what is the current price which?**

Yeah, that unfortunately I can't. I can't tell you right? Now because obviously. We're in a procurement process and OK, but if you ask me again in three months time, I don't know what your research is supposed to end then we'll be able to disclose everything. Yeah, yeah.

This is what is the total capacity of the biomass, which, because this plan which the Minister implemented that was for 220 megawatts, but I assume it's more than just by so 40 megawatts was biomass, I think it was about 50 megawatts of wind. 50 megawatts Wind another 40 megawatts solar how much are we? There, that's 120. OK. There was then a diesel standby power station 58 megawatts.

**What else was there?**

I think those were the main ones. Oh, sorry. They were two. 50 MW wind. Yeah, so I don't know if that adds up to 220.

40 biomass 50 solar 2 into 40 vent 58.

It's 40. It's 40. So OK, but it's roughly I can get.

44.

You there and. Also, I think that information is also public, you Google it. You'll you'll find it quite quickly, yeah.

**OK.**

**And you're building it. No oshigoto, right?**

So that's near 2.

**And I saw on the radio little map or something that you're also wanting to harvest the 100K radius, right. And that includes communal areas or years of planning orders from? The communal areas.**

So yes and no. So most of the wood chips to the power station is planned for what we call long term fuel supplies for the guys that use the sort of the machines and based on just the, the sort of the property laws in in Namibia, you're not actually allowed to harvest on communal land without a lot of extra permission, so we believe that they will choose to just go on private land because most of or at least a lot of the farmers who are into commercial farming, they like the concept of having the service done for them for free. Whereas maybe non commercial farmers are not so, so much into that. And if you go into communal farm, they would need to see the benefit. Otherwise, they say, why would you take our resource? But we do have separate programs plan to target, let's say, community resettlement farms. So for example, UM, I know there's a big sun Community there where they get placed on these large. These large firms and we are currently investigating ways in which we can devise a model to at least have them included in the chain, because then at least they can earn income where they actually live. So we are looking into the communal program, but it won't be the majority of the Bush that comes to the problem there.

**And how is it now organized? So you come there and do the harvesting for the farmers and then that's for free for them.**

OK, so for nampower we don't actually get involved too deeply in how the harvesters source their banks. What we get involved in is once they've got an agreement, we just need to know that they have an agreement that, from an environmental perspective, they are harvesting curriculum, but the commercial arrangement between the farm and the harvester is not non powers. We don't get involved, but as it's been happening in the market at the moment, the fuel suppliers don't typically pay the farmers. The farmers typically request the fuel supplies to come onto their farm next, so it just depends, like I said, a commercial farmer who's. For example, doing cattle farming or anything like that. If it wasn't for the service, they would have to pay someone to do it or they would have to actually spend the money to harvest themselves. So as of now for the Orongo none. Of the fuel suppliers, to our knowledge, have actually paid a farmer for the resource.

**And were there challenges in reaching like getting enough? Farmers on board.**

No, simply because the demand for the service was quite high. I'm talking about now how it has been and we maybe with our plant it might change, but in the past the demand is quite high, so. I think of the farms in that area, there's probably going to be less than three or 5% within that 80 kilometer radius we will ever have the privilege of having a fuel supply on the farm. There's just that much land that much push available, so it's always that the fuel suppliers have had more options than let's say the farmer. It's not easy to there's not that many contractors there.

**And what about yeah, because the power plant requires also water. So and you are quite situated away. From the coast and.**

Now so basically the area which we are doing the power station is it's one. Of the high rainfall areas in Namibia and the underground water is more than sufficient. When we did our geohydrology test, they couldn't even measure it because it was pumping faster than they could actually measure on the they meters. So we're not concerned so much about water. Obviously, in a drought, you might have to look at it differently, but our geohydrology tests initially were actually in one of the so the worst trials that we've had in them, we are think in 2019. So we we're not concerned that we won't have enough water for the power station and in any case. The power station is planned to have some air cooled condenser and what we call a zero waste principle, so they need to reuse the water and then the only thing that should be left is sludge which we'd have to. Remove and dump the a proper dump side. So yeah, on the water side. Not that concerned.

**And this 80 megawatts is just for the period purpose.**

Yeah, but after this, power station is only planned for 40 megawatts. And the idea is to feed it directly into the National Grid.

**That's good. And you said something about wood chips, right? So your form of taking the harvest is wood chips, not baking.**

Also, the economics of transporting with the power station, it's a lot easier to transport chips than big branches. You get a lot more volume up so they have to process it in the field and yeah, take it from there.

**And can I ask because you mentioned that before starting this run you also looked at ORAM bosmans how they did and how they? Go around their business. What were the challenges which they faced which you have addressed and yeah.**

So I think. The biggest one was, like I said, it was always the fuel supplies will always added advantage over the farmers because the demand for the service. So currently what happens. They harvest and then they get out. But because of the nature of this harvesting mechanical harvesting, the regrowth can be quite aggressive. So you have a very nice farm. For 5-6 years. But then you have 7-8 and nine. The way the farm looks after that is it. It's quite intense. So during our era, what we. What was seen as quite a big negative was that they don't do any form of aftercare afterwards, so we've at least included the first round of aftercare to be provided by the contractor, which tends to be the most expensive round of aftercare and also the most critical, because if you get it right the first time then the regrowth is not so aggressive and a farmer can easily handle that level of regrowth with just his existing livestock or few farm workers to manually uproot. Some of these sprouts have. So that's sort of one thing which we are trying to improve and I think the other thing is also just the length of contracts. I think orongo being. Cement factory there. We're not too sure, but from what we understand, the contracts are not very long. So providing sort of longer contracts 6 to 7 years gives the fuel suppliers at least some comfort that they can try to optimize against the base machinery to try to yeah, improve the methodologies, but at the end of the day, it's still a small market. So the idea is not to have all the harvesters come to us and then go to orongo. Well, I think they all feel that there's enough Bush to go about and we speak quite closely to orongo in terms of the project we don't see ourselves as sort of big competitors, but more partners to make sure that there's enough for. Both of us, yeah.

**And just understand the grasp of electricity in. The media so. Which part of the regions are very well connected to the grid, which was because you understood. Also there are regions where quite significant percentage of regions where it's. Not connected to the grid.**

So I think for the most part, all the major towns are connected. It's just got to do mainly with the sort of the extreme areas. So if you look at. The Kunene Region or going towards Botswana, which is very small. It becomes extremely expensive to extend the grid, so in some of these towns for example, they have mini grids come and tunkwa. I don't know if you've heard of them. Yeah, but Tumkur, there's a there's a there's. There was a first mini grid and then gum was the 2nd mini grid. But most of the in fact, I would say probably all of the major towns in Namibia and small towns are connected to the grid. It's mainly the rural settlements that are maybe too far away from town, where it's not that that well connected to the moon. I can't tell you off the top of my head what the electrification rate is.

My colleagues from rural education will probably be able to help. You better with that.

**Just looking at the electricity mix of Namibia is that is that information somewhere available in the website like how much percentage is doing so?**

Even our annual. Reports it's day every year.

Again, I can't give it to you off the. Top of our head, but I know.

**Any reports? It's all there. You'll know how many IP's there are. How? Many small solar plants, yeah, so.**

OK. And also one other big project which is happening in Namibia is likely hydrogen project. So it's number also involved in that.

More from a transmission perspective because obviously they would like to if they have surplus energy feedback into the grid. And then obviously we are on some of the working committees. Trying to you know, lend our expertise because it's not necessarily being developed by manpower, but we have a role to play in making sure that the energy requirements or the electricity standards are still are still well made because for green hydrogen, as far as I understand, they need to actually ring fence their technologies to ensure that there is no grid in feed or anything that could be seen as let's say coming from coal or something else. So they actually need to completely ring fence, they supply unless they I know in some instances there's talk of signing power purchase agreements with let's say other green technology and then be being connected to the grid. But I think there's still some studies and regulations that need to be worked out, whether that's actually allowable to consider. Your hydrogen fuel. So for the most part we are. Just involves sort of an on an advisory level, but then also as a technical partner for the transmission side.

And based on such kind of projects. So they're building their own plants. But along with that infrastructure to actually use it within their facilities, right, right. Can you? So they are taking care of.

**Based on your experience so far and also because of, you know, biomass power plant is quite not like a charcoal industry, it's more technical. So what was? Did you face any difficulties or think about the technical skills available like? People, people know how something.**

Yeah. So the good thing is we have a coal-fired power plant over here and we've got many years of experience in operating it. We also went to go visit other biomass power stations and to be quite honest, the biggest difference is only the fuel. Handling side, so the idea is that many of the staff that are currently working in the coal-fired power station will be given an opportunity to move over to the biomass if that's what they choose, and that we would at least retain most of the skills that we currently have from a project team side, obviously we hire fairly experienced owners, engineers to help guide us along with our own team. So I think we hired a company called Fishler in in from Germany they are assisting us with sort of the technical side and they'll help us oversee the project management and make sure that all the quality and standards are met. And yeah, and along with the Nampower team will make sure that all the local requirements are met.

Now just for example, there's certain standards that are very specific to Namibia, which may be European engineer might not get, let's say, air conditioning standards. What we typically set our air conditioners to. So just the, the, the sort of the local standards. I think they call it the SAN standard, Southern African, South African national standards, which also apply here. And then maybe. Typically, the foreign consultants are more familiar with their own stand.

**And in central, so based on also the projects which have been looking. So basically we are next 1020 years, Namibia's electricity mix will be much more from the renewable side. And also poor.**

Yeah, there will. Always be some form of import because you know all the that utilities in southern Africa are part of what they call the Southern African Power Pool, and there's certain rules of engagement that the Southern African Power Pool have. So, for example, Namibia falls under South Africa or Iscoms when they call control area and we don't have a lot of plants with what they call spinning reserve, so we are always connected to the South African grid and we get those sort of ancillary services spinning reserve to actually keep our grid stable. So even if there's not a lot of energy moving across, there's still enough energy to keep our grids stable so that we are not, you know, tripping constantly. And the same applies with the other utilities. So we're all sort of interconnected in some way, so you will never there. There's a high likelihood that you always have to import some electricity. The question is just whether it's, you know. Importing just enough to stay stable, or if you want to import you know the bulk of your electricity. And I think that's where the issue comes. Just the whole security of supply in terms of you know. If they can't supply you for whatever reason, they will always be some form of energy exchange between the countries. It's just about keeping at a reasonable amount that it doesn't put your electricity at risk.

**And like especially the you said, one of the one of the challenges with two challenges, one is the technology because it's expensive. The second was the procurement as of now you said. But because I'm just trying to figure out. Like, because if you said. Farmers were willing to just take all the resources away in that case, and there is also enough flat and there is enough Bush. So then what was the challenge?**

No, the challenge is the cost of actually harvesting that and bringing it to the power station, because now you need to compare it to coal you need to compare it to solar, you need to compare it to wind from that perspective, it's still expensive. I think the fuel supplies have proof that they can do it and no longer has been in operation. More than 10 years, we've seen 8-7 years worth of delivery records, so I don't think that the technology is the challenge. It's just the cost and the economics of the project. Whether that actually makes sense, yeah.

**That's right. And also interestingly, you did not choose any region near Okavango because Durango Simmons is near Okavango and some other projects from GZ and N people also said there was some biomass industry park or something. They were thinking here, but you chose Sumanth region, which is quite far.**

So there's a couple of reasons for that, so basically the northern part of Namibia, especially during the dry season also experiences a lot of sort of outages and each plant like this, these thermal power stations help with good stability. So it was an area which we felt from our transmission side would be a good part to injecting and then also from a Bush resource perspective. But the specific the specific Bush that grows in that area is highly aggressive. So in terms of the they call it the circle bus, but the yeah, the scientific name.

But it's quite. So in terms of actually tackling the Bush. Challenge that the resource is highest into. Yeah, so they would love to do with the resource and then also the transmission benefits at that specific site over other sites. But there were several site. I think there were six sites that were investigated. And we had basically a matrix of all the different criteria that we looked at social side technology side resource side and summer basically came up with this, which was a close second.

**But is it possible without disclosing any numbers or any? Any of the records to share this criteria? Is it possible to like what? Just curious, what were these criteria inside?**

The laptop I can I? Bring some so it. Was basically it was transmission impact. The Bush resource I think it was the social impact in terms of how many people would benefit from electricity or just from the project jobs, employment, that sort of thing. Just left my laptop here. I can check for you quickly. What's that? Is that have?

**You got that? Without numbers and those things you just like to see here. Know what I think it might be.**

Public, though, because it's on our. Environmental impact assessment and. That's a public.

So if you, if you look at the scoping phase. I think the scoping report is also a public. Document there that information will be there because that shows you all the six sites that will assist and how we came to. So maybe to do a detailed AI and. So if you if you search for. The scoping or code you should be able.

I can send it to you if you if you don't, but you will find it because someone recently asked me for it and I said it's in the yeah, they found it here.

**OK. And also just looking at the realization, because you said the pre feasibility study started at 2013 and now we are at 2023 terms.**

10 years.

Of the decade. And we are still looking at probably this year, September or next year to have.

If the basically the investment decision is to be made this quarter, so if everything goes well and they can always make sense, then there will be a positive decision and construction would start probably sometime in June.

Yeah, but I think it also shows because Namibia is. Quite a highly regulated country. Projects take time. So even some of the green hydrogen. Timelines are suspected. They will also take time. I know they've promised. A lot and quick things and maybe it's possible. I'm not saying it's not, but when you do projects properly, it takes time and also when you have lenders involved. That also takes a lot of time in terms of due diligence. They want to be sure that. They you know. Happy where their money is being invested, so it's not, it's not easy. Let me put it that way, yeah.

**And interestingly, you also said the contracts which you suggested was quite different from our you went for long term contracts about 6 to 7 years, but usually, yeah, didn't you face any issues with that because? Based on our experiences, farmers prefer to have short. Term contracts and immediate payment.**

We have the farmers. Contracts are short. Remember we are contracting with the people who are harvesting, so we don't contract with the farmer.

Yeah. So from a farmer's perspective, he gets on his land, the guys are out, then you know. Four to six months. Then they move on to the next one, so from. That perspective it's it's fairly quick. OK. Yeah.

And I assume that this harvester is Domingo energy.

They're one of the. People who are allowed to, yeah.

OK, OK, that's that's fine. OK.

I've got a question for you. You guys have all. So your synthetic fuels, do you need the woody biomass specifically or do you just need the carbon? Ideally so you wouldn't be able to, for example, use the carbon that was captured from the stack, or any unburnt carbon in the ash.

**Yeah. So.**

Basically, walk me through your process.

**So the technology which we are looking at is very similar to pyrolysis. So we need a solid form of carbon or. But yeah, would be biomass where we treat it with water at high pressure and temperature you get multiple contacts. So actually I can next day I was going towards the next.#**

Shows here, yeah.

**So this is the concept which we are working on called the bio hub where we have multiple communities here feeding the biomass which can be used for multiple purposes.**

Let's say for example we also need wood chips so. This can be platform for non power for us and for other other value chains if need be and then it will be transferred to a biomass. Where this process will happen? Pyroil HTL hydrothermal liquefaction is the technology name.

And for the day.

You just need the heat.

Biomass, and yeah, biomass, water, heat and electricity.

These are the inputs and then we get 4 predominantly actually 4. We get 4 products majorly with bio oil and biochar and bio oil will be further treated in a refinery to yeah to consume it in the ships actually. And then biochar based on properties. And brought back into the community, but on a different form. It could be based for activated carbon for purifying water or in terms of soil amendment as a fertilizer. Or it can still be. It's a solid carbon and you can still burn it for producing electricity and things like that. It really depends. On what the need of the community. In addition the plant will produce an off gas. And the water stream. But those will be recycled within the plant. It won't be valorized much outside. So this is the concept which we are working. CC yeah, carbon capture CCS. That's this technology can not yet can do that. Yeah, we can't consumer gaseous raw materials. It has to be a solid or a liquid gas, but we can, but once again this we are trying here to understand the characteristics of this biohub you mean? You can just shift this technology instead of this technology. If you put a seam gas fermentation here that can utilize CO2 from the stacks and actually. We are doing quite some how to say projects in our section where we use the stack from the steel industry actually and then use it for a syngas fermentation to produce ethanol and so on. And so forth.

Because my suggestion would be it's not going to be easy to get the another biomass power plant up in a short amount of time because this one needs to sort of prove the concept and we have a lot of space on our land, so it's not to say that automatically nampower can accommodate this whole process, but it might be worthwhile looking into a, if there's any way to make the synthetic field using one of the byproducts, whether it's carbon captured through the stack, whether it's. I don't know if you, the chemical engineer you wouldn't be able to figure it out. It might be a more complementary fit because what we did at our power station was just to make sure that we would be able to have the waste heat extraction in the future if we need that. It is already the site, there's all that infrastructure. So then it would just be additional. Value addition plus, I mean it's because the power mass power plant is expensive, so. Yes, the hub is. It's a nice concept, but I think it might want to attach itself to an existing biomass power plant, because I don't know after this one whether there will be a decision to say, OK, great, there's more space for another one because you need to take it for this. This power, and if you can't get it at a specific price, then that whole thing will fall apart, yes. So it's just something to consider. Definitely, yeah.

The new facility will definitely be electricity that can also will benefit from placing near a power plant. I completely agree, but also thinking in terms of futuristics because you are right now, your economics is on a higher side because you are competing in the end, product is electricity so which means you are competing with solar wind and those kind of things. But the one we are looking at is actually fuels. It's a different commodity. It's a different market and yeah.

So this is just a refinery, it's not. Actually a power. OK, I understand. OK.

It's not about bound. It's a refinery itself. But on the other hand, this refinery can be placed near the park front. You can still also it gives us also room. For you to expand or things like that in case in future if you want to convert this facility right into you put additional solar or some other plants nearby so you all know that that that's an off taker just next to it you can directly use this plant to feed that feed that differently and things like that. OK. So no. Yeah, that's the concept we are we are trying to realize and understand what hat can happen actually? You see a lot of potential for this, especially now that number has been putting most of its fuel from outside the coating. So if you have an opportunity to develop such a refinery and produce fuels, it could benefit a lot. But what we are trying to understand is that from especially from non per project. What do you think are the major challenges? One is the procurement you said and also the technologies quite expensive. Do you see any other difficulties or big challenges in engaging, let's say, for example, in engaging the community or that should there is a lack of capacity, things like that?

The capacity on the fuel supply chain will need to be improved. Ultimately, our project would aim to do that quite drastically, so you know. But at the same time, I don't know where you are in the whole licensing and so forth. So by the time you're actually ready to actually build the fuel supply chain could look completely different. So then there would be at least enough capacity to take that on board. The good thing is there's a lot of people interested in this. So for example, I know Cecil and so forth have been quite interested in in discussing potential partnership, even at the biomass station mainly for the wood chips also but just to see if there was no way that they could somehow also piggyback a refinery for close to our biomass power station shake heat and so forth. So I think your biggest challenge is will won the funding, the fuel supply volumes, I don't know how. Big this is.

**Yes, I was. I was heading towards that.**

That we've chipped them on per year.

Yeah, we. Are pretty much looking. Can consume a lot, so I would say minimum will be at least £200,000.

Yeah, that's going to be a challenge cause. I mean, that's really. Sort of. How demand and that's a challenge already, so. The Yeah, the supply chain would have to increase dramatically to accommodate both our plant and this one.

And then the challenge is mainly the harbor.

**Yeah, having enough, having enough competent suppliers to actually bring you that wood chip. Also, what is your size of your? Yeah, I know.**

Let's say. Not more than 5 centimeter.

Yeah, that's that's going to be also a massive challenge because the smaller you go on your wood chip, the more maintenance and more punishment you get on the machine. So one of the reasons we decided to go to P-100 was because it was a perfect fit between having a great fire. Boiler and also it was less than what the wrong person meant for us and they asked for P30. Which which is quite a. Challenge for for these guys, it's obviously. A-100 chip. It sort of looks like the bag on the left. So we can burn that. Quite easily where so long as looking on. The right and to get from the. Left to the right is a lot of money. So you want to get from there, further right.

That should be.

So, so from that perspective with you, your, your cost is going to be a lot higher than than the normal market rate.

[…]

Wasn't this initiative for ready by Gizz and was it nest or. Yeah, yeah. So you picking it? Up again or?

No, I could. We never, we never knew this, this this concept was here already.

OK.

So we are. We were doing these things and then we came to know and then we were actually interested. Then we saw such a concept.

But I assume you're not going to redo it again.

OK.

Surely you're just going to refine what they did and find the missing gaps.

And what's needed to, OK. Take it further. Because they have done some things already, we wanted to address what, where it went wrong, the lessons learned, and then maybe, possibly take it from there and then processing we are not ideally in an ideal scenario. We don't do it from scratch because all the knowledge is already existing , we just want to make use of it and also what we want to actually do is this project can fit in from you want to look at all other projects right now happening around Bush and also help the city renewable energy in the media like now powers clean. In the payments industry research there is new things happening with fuel development and so on and so forth. How this project can complement others. Like all the projects can bring together, I think that's because individually, right from scratch as a standalone, any project will face a lot of difficulties. But if we can have or utilize. You know each other's strength and infrastructure. The feasibility of the project is much improved drastically, so that's our belief. Let's say, for example, today there is a biomass power plant right there. From a region maybe from 20 years from now, though, we can still use the same infrastructure for wood chips. But then in that case the power plant will be replaced by, I don't know, solar or wind. So your electricity is still be, you know, supplied the best power plant. Wood chips chain will be used for some other purpose because. Using biomass wood chips for electricity. Yeah, you said it's always not economical and I don't think it will be economical always, especially with lot of projects coming up specifically with solar and their economics will go down by yeah, so this is this is what they are also if we are using the same wood chips, if there is enough resources available. Yeah, you can also benefit from the economy of scale. If two projects are comes, yeah.

**Have they ever retrofitted? Let's say or find you from an old power station.**

Us thinking of as of no, no, but they have integrated them. Because retrofitting. Yeah, power plant is just one small part of the refinery, but they have they have used there are lot of things. So they where they are integrated, old power plant stations and things like that out there in the petroleum. You finally go, yes.

No, I'm just saying it because this coal-fired power station we have. I think there's a 6 to 10 year extension of its life plan and it's only because of this situation we found ourselves in in, in the Southern African region, but ultimately that needs to be decommissioned and we need to find. Some value with it.

**Where would that be?**

That's right there. Yeah. OK.

**So yeah, so they need to find a plan on what? What exactly are they going to do with it later?**

So currently it's got 4 boilers, 2 of the turbines were retrofitted to have what they call synchronized condensers, so you can just.

**Yes, OK.**

Obviously, run the electricity through them to create. Great support, but ultimately a plan need still needs to be developed to see how will we what will we do with that building afterwards? So it might be a starting point, seeing as you know, winter is fairly central. The green hydrogen is sitting closer to the coast. But it seems a lot of hydrogen developers are now targeting office bands for Good Month also for that.

**What do you say?**

Harbor. So it might be. If it's a possibility, it could be a good fit.

**Currently we have to think about it. Yeah, because it's also we are trying to use biomass. We have to still think what's the biomass supply around this region.**

So Namibia breweries, I'm sure you've visited them they also.

Have a biomass boiler.

So they harvest just outside Yang winter. It's just A5 MW boiler for heat and so basically there is still quite a lot of environments within this area which.

Yeah, yeah. Think of that. OK. Yeah, it could be, yeah, because it's always it's some if some infrastructure is already existing. Yeah, definitely that will be. Of help definitely. No, these these were the major, major things like, yeah, one of the things we want to say is, like, this is also early stage like we are really take in the early stage of the project. You can call this as maybe pre feasibility study of this this project. We want to. But even the difference is that we want to think of all the show stoppers at a very early stage. If we can put the finger on, those will be the show stoppers and we can come up with already a mitigation plan and design already that would fasten up the process. Of maybe yeah.

**OK. And it's still just mainly the refined unit.**

Yeah, yeah. And yeah, there is also new fossil reserves from. Just outside the coast of Namibia. So yeah. Within 20 years, they will. Be quite different than how it is. Right now so.

We'll see because the other problem that we have is. We feel like our mineral resource Act still sort of benefits whoever discovers it more than necessarily the country, so it remains to be seen what structure will be done. But I mean anything that creates at least jobs and employment will always be benefit.

And that's also one of the things we really want we don't want. As you can see, we don't want to make something. And take it out this refinery will be in there will be. That's our aim. But then if it becomes really close to impossible, then we will think of something. But our idea is to actually have this here at all. This Bay or something like that, or near to the biomass plant, if that's possible as well.

Because then otherwise, Okahandja might be a good spot because it's right on the. Sort of the tee. Off to go to even took on the coast. So Kanji is right there, yeah.

**And also we actually prepared a power interest grid actually based on the stakeholders, this was done before we came here. So where we put in multiple stakeholders power indicating their ability to actually do something, let's say for example, if an actor wants this projects done now. He has the power to do that, power and resources to do that and in the X axis you can see. The interest of. The low to high things like that. So can you just look at it and?**

I think you're missing the utility simply because you're going to have to connect to them. They're not going to show much interest. Your project, you're just going to be seen as another customer, so OK, it won't be low. But in terms of how much your project will cost the economics of your project power supplied to it will be quite critical. So even when you're picking weight to locate it, depending on how far you are from the grid, you will be charged a different price so. If you are needing a lot of power. And you are planning on putting your project somewhere where the week is other where the grid is a bit weak. Then you can expect your grid connection costs will be quite high so I would put numb power somewhere. Sort of the right top left block.

**OK, when you say national government, do you have someone specific? I think you'll have to be more specific than that?**

Your biggest stakeholder is going to be the Ministry of Environment. For action and tourism.

But also on the other hand, we. Also administer of my Internet energy.

As long as the Bush is involved is harvesting permits, there's forestry guidelines, there's yeah. And they're the ones who manage the environmental impact assessment. Yeah, OK, that's why I ask these national government just.

Well, you have to get an environmental impact assessment so they're the ones you can have to engage with the most and once you're in operation, if it's got to do with wood or wood products, it falls under the forestry axis.

**Are they also the custodians of that? The Ministry of Mines and Energy will?**

I mean, it will be important towards the end maybe, but to get things started FT is the one you need to have on your side here. Yeah, I think that's. That's all I can think of right now, yeah.

Yeah, these are the major things.

So do you guys. Actually get to see a harvesting operation. I think you came at the wrong time of the year for that, unfortunately yes, but yeah.

**Yeah, yeah, a little bit we saw.**

OK. OK. With that was really I'm surprised this time of the year, but OK.

**Yeah, no, but, but, but yeah, we missed it. But yeah, let's see, maybe this week if we are trying to go to Omega. Energy or something? We still have to have an interview with them.**

OK. OK. I think this is my thing.

Are you so much? Do you?