**T1 - Interview Transworld Cargo, Windhoek - 24-1-2023**

**Can you start by introducing yourself? What’s your role in organization?**

My name is [name], and I am currently with Transport group since February last year so its about a year now. I come out of an engineering background, landscaping, construction management. Studied in Weihenstephan in Munich, 4 years. And I have been back since 2018. Worked at multiple companies and now I am here.

Transport group is a multi-business company. We do the core business logistics. So Transworld Cargo has been operating for 40 years now, round about 40 years. We can marine transport everything from there. So basically everything in and out of Namibia, through our hubs, and Windhoek is our biggest one, and this whole property then Walvis Bay, we have a big property. Exporting copper is big coming from Zambia and all sorts of other commodities. And then we have office in Hamburg as well handling the German import and export. And then we have a few other offices. We have one in Botswana. That's the logistics side.

Then we have the agricultural side. We have table grapes. We have company called Orange River Vinyard Investments located in Aussenkehr and that's on the border of south Africa and Namibia, a town on the south. And about 200 hectares of table grapes for export. Finished the season just now, end of December and we exported, I think, 200 containers of grapes to mainly Europe, England, Germany, Netherlands, few to Singapore. Then the biomass, which is your part (laughs), we have been in operation for 10 years now, 10 to 12 years. Harvesting and supplying wood chips to different use such as we first, when the project was started, it was to produce a ## [02:59] but we quickly noticed that it won’t work with the Namibian bush because of the ## [03:07] of the equipment. Currently we are supplying our main uptakers Ohorongo Cement which is a German-owned cement factory located near Otavi. They belong to the shrenk group. They co-fire their furnaces with woodchips because its a German cement factory. They want sustainability so they also use our RDF, if they can, and wood chips ofcourse. There was a time when coal was expensive so then they looked into woodchips, so that's our only and biggest offtake today is that they take about 700 which is thousand tonnes a month which is for Namibian circumstances a lot.

So yeah, that's basically us in a nutshell, and then there's of course a few other things that we are working on - the logistics and the ## [04:24], they’re always open to new stuff to get more value to the biomass.

**And you also said that Marine Transport, Transworld is involved in Marine Transport?**

Just the export and import of containers, through the port of Walvis Bay. We don't own ships or something. But yes, we do use the port of Walvis Bay a lot to export all kinds of commodities. Copper is the biggest one. Copper to China and then import, the whole chemicals for the mines. Ammonium nitrate, we do the import. And then chemicals for the mines as well. And then a few smaller things.

**In terms of Infrastructure, let us know how it is. With respect to road transport, rail transport, freight which you think, because we also came to know that transport is a part of Walvis Bay corridor group?**

Yeah we are part of that but I am not so into that so I don't know much about that. I know that we do a lot by road. The biggest problem in Namibia is that the railway is not utilized to its full potential because of lack of funds, lack of management. It's a power ##[06:15] company and it was mismanaged over the years. So the maintenance wasn’t done. There's not enough roading stock. But as a group we do believe in rail transport for the future. I hope we didn’t bet on the wrong host. But we built our own siding just here, last year. So we invested quite a lot of money to get our own railway coach here to import mainly barley for our breweries in Germany. So we get about 400, now until end of february about 400 to 500 containers. So the main, cheapest is railway for the distances, then road is expensive but it's all over the world. We do have air as well, exporting fish to Spain, fresh fish to Spain.

**Thanks for that. With respect to Ohorongo Cement, can you explain more on that? Do you also like harvest, and do logistics or do you just collect?**

We do the complete supply chain. We find farms to harvest. We get the permits for that. Then we harvest the bush. We do it with a roller. The bush gets rolled first. You should write on Ombengu Energy is our bush roller company. It's not our company but we use them - subcontractor. So we roll the bush then the bush needs to dry for at least 3 months. So we do in-field drying. Then it gets raked. Then we come with our chippers and process to, for Ohorongo its P30 in size that's average 3 centimeters upto 10 centimeters. So I think, and below that. Then of course delivery to the plant.

**Do you pay the farmers for biomass or? How does that work**?

No. Currently, we are not paying the farmers. We are not paying them and they are not paying us. We are coming up to the farm, taking away the biomass, and ## [9:16] our costs but the farmer doesn't get anything for that. But he has a higher stocking rate in the next few rainy seasons. Because the biomass here is not the biomass which we harvest, is a problem. So it's the encroaching bush that takes a lot of grass away and support. Groundwater levels go down if the encroached bush is too much. So we are doing actually him a favor to take it away. He does not, he gets the grasslands, and the savannas afterward.

**And how do you ensure that harvesting is done in a sustainable way?**

Well, we try to, first, there are FAC certifications you can do that. But it’s a huge process. Now for our operation, because it's not so big, we tackle about 500 hectares a year. And that is the limit that you can do without an environmental impact assessment, FAC certification, and all that stuff. So we are just taking a little bit out of, say, the normal farm size is five thousand hectares, so if we take 500 hectares, then, it requires sustainable because its so much more. We could take more, but then thats where we would need to do a lot of studies, spend a lot of money to get that bigger hectares or more hectares.

**So I assume all these farms are then commercial farms?**

Yes, currently, we are on commercial farms.

**So for harvesting this 500 hectares how many employees do you need for that?**

We have about 6 to 10 I would say. Its highly mechanized so we have 2 … 1 ship is standing here. The smallest one is on the yacht. And they are all bandit, horizontal grinders and then tractors and excavators. So no manual labour actually. So it is highly mechanized. Because gets too expensive if you employ so many people then you need to have more managers and people looking after them and thats’s always, the issue with the farmer is he wants the bush gone but he does not want to have much people on his land because of encroaching, stealing.

**And these 6 - 10 employees, with highly mechanized, can harvest around thousand tonnes per month?**

Yeah, I think we can do more. That's currently our.. Because we can just produce, what our offtake is. We have months where we do 1200, 1500 to 2000 tonnes. You can scale it up ofcourse but we just skipping it because it costs a lot of money to run the operation. We rely on fuel, diesel and in-field chipping is only done with diesel so and the diesel price went up. ##[13:09]. So yeah its quite linked to the diesel price.

**In this system, what are the major challenges that you face?**

Well, here currently is the offtake. We dont have enough. We could go bigger and better prices. The problem is the price, the ones that are here, that they're paying here is too little. Actually to make it commercially viable operation, we are running at the break even because we think for the future, investing into the future. But that's our goal currently, to run breakeven but not making money out of it. So, the biggest issue ofcourse is that we rely on the diesel price offtake. If we can scale up then the price will levelize itself probably. Logistics, then to the properties of the bush, you cant use it for anything. The bush has quite high ash content. We are talking about 5 to 10 percent of ash. It's very dry, that's very positive but the ash content is very high. So it's very abrasive on everything, on the chippers, the pre-cut machines, they didn't like the ash. a lot of sand, because we harvest the whole bush. Like in Europe or Canada or where else, you would harvest the tree and the bark is removed most of the time and then it gets chipped into woodchips. Here, the whole tree, the bush, its more a bush than a tree. So if we use only the big stems then we won't come to our tonnage per hectare. We would leave a lot behind.

**The workers that you employ to do the harvesting, do you train them or are they local employees of the area or you train them in ##[15:42]?**

No, they aren’t trained. Its a whole infield operation so they are mostly trained there. But the workers there have been there for years so we haven't employed anyone new lately or in a long time.

**Do they have set contracts or do they get paid per tonnage?**

They have a basic salary and then they get a bonus for tonnage as well. I don't know how much it is but they get extra for delivering the tonnage.

**With respect to the contracts, which you have with Ohorongo Cement, is it short-term contract or a long-term contract?**

We get an order for a year.

**So basically, its an annual contract?**

Yes.

**And if I may ask, at what price do you sell to them?**

Currently, the average, base price is at 980 per tonne, in Namibian dollars. And we get bonus or something extra according to the calorific value of the woodchips. So if the calorific value is higher, then we get more. They have a formula for that. So our average currently is at 1050 to 1100 per tonne with calorific value adjustment.

**And this calorific value is done at their side?**

Yes, they take a sample of every truck that comes in and then end of the month we get the whole data and then we invoice them according to that data. They check for calorific value, ash content, moisture, any other stuff that’s in there.

**So maybe we can already explain what we would like to do here. This is kind of a supply chain or a concept that we want to employ in our project. As I said, we are looking at using this bush, and valorizing this bush to produce marine biofuel. We want to have this in the form of a concept called Biohub where we have like a community with a single big refinery then it is fed by a lot of individual communities or in this case it can be in multiple forms. Combination of commercial and community farms, you know, where common biomass is collected. This biomass can also be used for other purposes, for other value chains, and so on and so forth. Let's assume this could be woodchips. And this would be fed to a refinery where we employ a technology called hydrothermal liquefaction which is like wet pyrolysis, very similar to pyrolysis, where we produce 2 major components, bio-char, and bio-oil. Bio-oil is of our interest, which we can upgrade in our refinery and then use it for shipping. The bio-char that we get as a byproduct can be repurposed back into the community because expect it to this ash content is predominantly high, and all these minerals with carbon, so either it can be used as a fertilizer for soil amendment or it can be burnt to produce electricity or even used as water treatment in terms of activated carbon but it might need some processing in-between. So this kind of a thing we want to use.**

**The transport-logistics place as you can see, transport comes into play in getting biomass from each field into the refinery or processing site where it is being chipped and then to refinery. The finished product has to be taken to another location, either to the coast, or based on the commodity, returned back to the community. As you can see, transport plays a very crucial role.**

**What do you think are the benefits of such a thing? Or first, is it possible in Namibia?**

I think its possible. The biggest thing we’re facing is upscaling the harvesting. So I think in the whole supply chain, harvesting is the one with the most risks. Because of the rains, we can only harvest 10 months of the year. Because the rainy season would destroy too much soil. The machines get stuck. If the bush is too wet then the fuel consumption goes up… too many things. There's another, this community type of thing then the biggest obstacle would be, the logistics, I would say. We have another project for charcoal. bigger charcoal project where we all are shareholders and produce about 7000 tonnes of charcoal per year. And they, similar to this, they get chopped wood from surrounding farms. So the farmer employs manual labor to harvest the bush. They chop it up and the factory basically comes and picks it up. And then uses it in operation. But those are mainly commercial farms I think. There would be, the problem here also comes into commercial and communal land has different permitting, permit thing issue. So for a commercial farm, you would get a harvesting, you need a harvesting, a marketing and if you do export then export payment. But you need a harvesting and marketing permit to sell your product from Ministry of Environment, Forestry and Tourism. If you don't have an environmental impact assessment for the whole area, then you only get it for 3 months then you have to reapply. So its limited to 3 months.

**And if you get an environmental impact assessment done then you get it for a longer term?**

Yeah, normally 3 years, 3 to 5 years, depending on the environmental impact assessment. and yeah you need a transport permit as well. Transportation permit, that's the third one. Transportation permit, marketing permit, and Harvesting permit. Transportation permit is the most stupid one in the whole supply chain because actually for every truck, for every delivery, you need one permit. That permit only holds for a week. But for us now, just example of Ohorongo cement, we deliver 15 loads, 3 loads a day so yeah 15 loads a week. So I would need 15 permits, 15 different permits a week.

**That’s only for communal farms or is that for everyone?**

No, that's for everyone. Communal farms, I think the same transport permit applies. There, the harvesting and marketing permit only lasts a week. I don't know why.

**And commercial farms?**

Commercial farms is 3 months.

I don't know why its like that. I haven't checked information for that. The duration is quite smaller so its a lot of permitting if you do it that way. But I don't know if, for the marketing permit, the environmental impact assessment can extend that.

**And this is irrespective of how, to what purpose you are using the wood like charcoal, feed, anything?**

Anything yes.

**And transportation permit is also from the Ministry of Environment, Forestry and Tourism?**

Yes. it's the transportation of forested products or something.

This 500 hectares that you are dealing with, this is spread around how many kilometers roughly?

Basically it's the region. Yeah. Those 500 hectares is on one farm. So what we do, we go farm to farm we stay there for a year because shifting the camp is a huge logistical thing so we normally stay on one farm for a year which does 500 hectares roundabout. So and they are 5000 hectares big and it is in the same vicinity. So the harvesting area is not so big. Commercial farms and charcoal production spreads normally over the whole farm.

**Do you make camps for the workers to every farm you go? Do they stay in the camps or how does that work?**

Yeah, we have containerized living quarters basically so if the farm is, we are done there, we pick them up, take them to the next farm and put them down again. And then they work 20 days and then they have some days off.

**I guess they were 20 days behind each other?**

Yeah

**Do they work more than 9 hours a day?**

Normally, not. 9 is the maximum. because also of the light and you need day time production. So 9 hours maximum.

So yeah logistics is big. And also logistics for bulk to where ever. I had just another request for woodchips to Germany. And the bulk export is a huge issue currently. It hasn't been done yet with woodchips. That its lucrative or that it makes sense to bring across town. Port of Walvis bay they do coal and few other but haven't done woodchips. So they don't have storage for woodchips. Needs to be stored out and then it gets wets and then it deteriorates. But yeah in this case it probably goes into tankers and yeah.

**So ideally we would say that this port or this facility would be in Walvis bay and the export will be, this would be somewhere in these communities, like Windhoek, Ohorongo, those kind of regions and then the bio-oil will be sent to Walvis bay refinery?**

Yeah, it makes sense to have the factory or this part to have as close as possible to the resource. that is the biggest, a huge cost because of the bulkiness of the wood.

**If I have to get an estimate of how much energy or diesel the chipping equipment consumes and those kind of things, who would be the best option to ask? The farmers or you have data?**

I can… between 4 and on a higher side 8 liters per tonne. That's high, 8 liters is high so round about 6 liters is our average.

That's only the chipping. With delivery, its roundabout, average between chipping and delivering is 14 liters per tonne.

**The average distance between the harvesting site and Ohorongo cement will be 30 kilometers?**

Currently, it's about 50. A round trip is 100 kilometers.

**Do you see any other challenges or opportunities in this setup?**

Challenge is the harvesting definitely, to get the tonnage up, to get enough feedstock, to make something like this viable. And ##[30:59] we are working on another project for wood pellets as well. And the remuneration for the harvesting part or whoever delivers the wood needs to be… so its a bit numbers game I would say. And then to sell it at the right price to get it all the way back to the farmers. Then a lot of education regarding sustainable harvesting. Europeans want a lot of FACs and stuff and that costs a lot of money, a lot of time, a lot of workforce because you have to map everything. You have to check if there are danger plans, birds and all that stuff.

**Do you see, like with the current capacity and current infrastructure in place in terms of storage and also for connecting between the cities and things, do you think as Transworld Cargo you could be a potential stakeholder in such a value chain in future if this comes into play?**

Yeah definitely. I mean we have always been the ones taking extra step in logistics and agriculture and the biomass is just one example of that. We are one of 4 companies I think that does that at this stage and also this experience that we gained over the years already. For equipment-wise, abrasiveness, ash content is a huge thing. We have seen European equipment (laughs)... they promise you everything and when it comes here and works 2 or 3 weeks it breaks down.

**Where do you get your equipment from?**

Well, the chippers we currently have are American chippers. And yeah normally, we have a, there’s department in South Africa that supplies ##[33:41] in southern africa. The trucks scania, the tractors Massey Ferguson.

**And these loads which you usually handle, what size of truck are we looking at? 32 tonnes? 60 tonnes?**

No thats about 32 - 32 tonnes, its a open top, walking floor and that 32 tonnes is about 90 to 100 cubes.1cube of woodchips of our size is 150 - 300 cubic meters.

**For woodchips that you harvest, do you do selective harvest or do you like harvest different species?**

Well we try to target areas that are mostly encroached with main species we may harvest because you only get permit to harvest few species. Acacia mellifera is one of them and there are a few others. So we target those areas that are encroached the most and that don't have any other or so much any other species that could be harmed.

Thats how we, we check the density of the bush and then we decide where we go.

Because we want the most tonnage per hectare and doesn't make sense if someone already..

**Just an assumption, correct me if I'm wrong that you are also involved in the NAMB power project? Because they are also coming up with new plans to build biomass powerplants?**

Yeah. we were. We submitted a letter of intent to supply. We didn't take part. They had a tender out, huge tender, supply of hundred and eighty thousand tonnes of woodchips for their powerplant. But the tender was so complicated and so out of place that of 10 companies, only 2 companies made it to the next round, submitted a full tender or put in the money to put in a full tender. Yeah but we have been part of that project, they have been to our site already so. They have visited our sites, our harvesting sites and we just had a meeting last week with ##[36:32]. But I don't know what's happening. I haven’t told anything. Apparently, they are coming out to retender. That project is 10 years old already, they have been planning that for 10 years. And it's just a 40-megawatt powerplant so. Government stuff takes super long. Namibia, Africa is super small.

**And all the trucks which you employ, just out of curiosity, do they have biofuel mandates or something?**

There’s no… #[37:23] deliveries we do with one truck. We just have 1 truck running currently. And it runs on normal diesel. so nothing... I don't think there's anything like biofuel. We ##[37:33] already so.

Everyone is big in green hydrogen and stuff like that. Putting their money into that but I don't know if its coming to life.

**Looking at the social side, especially looking at the conditions the workers, i am wondering, do you give any benefits to your truck drivers, what are the social benefits for them? And the harvesters?**

All day I have access to the pension fund that we do over the company so the company has its own pension fund. And they have access to medical aid but that's voluntarily so pension fund is a must. They have to pay a certain amount or the company pays a certain amount of their salary into the pension fund. Medical aid is voluntary but we offer it over the group and because its not expensive anymore. With insurers, the medical insurers because the medical system here the government medical system is not that good here. If you are privately insured then you have a better chance of survival.

And social security, we do the, what we can do but government office not so much in that regard so. They have working contracts which is quite good already . they always get paid at the end of the month. That's also a big benefit I would say. The overload of people that doesn't get paid frequently. The living quarters, they are very straight forward but they have ablution, they have running water at the sites, small solar lights, gas stoves, so everything they need during their time on the field and then they go back home wherever that is for the time off.

**You said you harvest, you roll them and then you leave them for 3 months for drying. So that means your harvesting site is, or the chipping site is not the same as, so how does it work? You have to schedule it correctly?**

So if we see that we are to the end of the harvesting or the chipping cycle, then we would scout a new farm. And set a ##[40:45] 3 months prior to ending on the other farm,

**So you take all those things, scheduling, constant supply because I also assume that its a constant supply. Every month they would need this much amount of ##[40:59] because it's a cement factory so its ##[41:02].**

Yes.

**What do you do for the months that you can’t harvest?**

Well the people, they’re going home or we doing maintenance on the equipment. Yeah, mostly maintenance on the equipment.

**So you pre-harvest and then you store the extra amount somewhere?**

Yeah we try to do that. The cement factory is also not running all year because of the demand. So there are 1 or 2 months at least where we shutdown .

**Do you also see if such a value chain comes, do you also see any disruptions? Because there are also current existing uses like charcoal, bush to feed, Ohorongo cement, bio-char, some private projects happening as well. So do you see disruptions, or a chance for collaborations or you know like?**

I think if the harvesting site and all that stuff is sorted out then there's certainly enough feedstock for all of these projects. But if the harvesting site is not figured out or done correctly then it would maybe be an issue. Because all of the infrastructure that most of the stuff lies along the railway roads and they only go straight up and not to the sides so much. so there's more bush. Probably you have to draw it further to get your bush in future. And also depends on re-growth. The farmer lets it re-grow and then you have biomass and in 10 to 12 years again the same. If not then you have to try further for your feedstock.

**Do you do any aftercare?**

Currently, we dont do any aftercare. That's on the farmer's account, if he wants to do it, he can. If not, then its his problem.

**Do you think it can be a problem in the future if you start collecting this biomass a lot and the farmer puts up his hand and say “please pay me for my biomass”?**

Yeah… Im not sure, it's a difficult question. They’ll all probably say pay me for my biomass but then there's so much in the current state that you basically can go to the next farm and say “whats up? You want us or not” In the beginning the first place that we harvested, that farm even paid us to harvest. So other controlling mechanisms for the encroaching bush is also with chemicals and there they pay 2 to 3 thousand bucks per hectare for the plane throwing chemicals on the bush ##[44:15] not using a ##[44:18] anymore. Because if you touch it and it gets all dusty so you cant use it for woodchips anymore.

**Do you give health and safety training to your harvester?**

We do but yeah, it's always a problem, you have to follow up all the time. Be on-site and tell them, please don't do this. So its a constant thing. Also, i think it needs to be done a lot more. But then its not so strict like in Europe for example. Here, I mean we do 2 PPEs and all that stuff to the best we can but in the end its the workforce that needs to look after itself.

**And these 6 to 10 people that you said who would be actually engaged in the month of harvest, are they the same 6 to 10 people you use in every farm or do you change?**

Yeah. currently the same people. If it gets bigger then you need more people and more farms where we harvest at the same time. Currently, the offtake is so little, doesn’t make sense.

**And also you said something about the harvest site being close but also being dense but also connected to the infrastructure in terms of roads and rails. Based on your expertise on other projects, do you have like any certain locations which would you recommend like okay look at this, this would be much more you know, because right now we are looking at Acacia Mellifera as one of the species?**

So we are focussing our harvesting around Otjiwarango, Otavi, where the rainfall is quite higher but not so high that they have the subtropical plants growing. So the other projects are mostly located near Otjiwarango and Otavi. Ohorongo cement is between Otavi and Tsumeb. The powerplant location for NAMB powerplant is in Tsumeb, north of Tsumeb . But there's also a lot of bush if you draw from Otjiwarango to Omaruru, that road, there's also railway there.

**Is the railway being used?**

Currently, not. We want to use it in future but currently it's not used for that.

**Well I presume there's probability that the harvesters are men, do you, in the future, would you look into having like, what are your equal opportunity policy in the company?**

If I look in the harvesting side, if I see the work, I mean it's quite tough but I want to say that women can do it. If one, if they want to do it then sure. Currently, we haven't employed in the last few year. But it's mostly men also in the other supply chain of charcoal and all that stuff is mostly men that do the work.

**Truck drivers?**

Truck drivers also here in Namibia, mostly men. Really little women but that's only because the women stay at home with the kids and men go to work. That's mostly the reason why men do most jobs.

**Right now your business model is aimed or working as break-even so if you want to improve that and based on this, what do you say some configurations which can be made like, for example, you can have multiple locations where it has been stored for some time in those farms and then you can collect it from there. Is it like a combination of centralized decentralized, is it something that would help? Or what can be done apart from increasing the uptake?**

I would say, if you chip in-field to a bigger woodchip then the fuel cost goes down, the fuel consumption goes down. What we are also looking at is chipping bigger in-field and then chipping again at the plant with electricity which is much cheaper than chipping with diesel. But ofcourse if you go bigger in woodchip size then you cant transport so much anymore so it's a very fine line I think.

**For the same stuff, we have prepared what we call as a power-interest grid. based on the different stakeholders, what would be their interest, power in terms of you know as we speak like if they have a decision, they want to make something happen in real life, they have the power. They can make it happen. Let's say if they want to bring in a policy, they bring in a policy next day or something like that. Or a big company who has the money and the capacity to do it. if they have an idea, they can implement it soon. And interest is yeah obviously to a harvester, to have an environmental impact and so on and so forth. Maybe can we ask you to look at this and see whether everybody is in correct position or first of call where would Transworld Crago will be positioned currently but also how you would like to improve. Because I realize that most of it is almost connected and you pretty much do everything.**

I’d say the government, the interest is very high but they are not doing enough. The process is really slow on a governmental. If they’d do more then there would happen more I think. Commercial farmers, they are fine. Yeah, it's quite accurate actually.

**Because here it would transport quite low, power low, interest position, would you agree with it?**

I would put it a bit higher.

**Bit higher in power or in interest?**

I think in both.

**So diagonally?**

Yeah because for example, for us now, if we develop an effective way to transport more biomass, then we would be the first ones in the country to do that. Also to export biomass and all that stuff so yeah.

**Do you have a special team working to optimize that value chain?**

Yeah it comes project based. So we are working on a project for wood pellets and we’re trying to minimize the cost for exporting the wood pellets. Because they are just for export in bulk. Through port of ##[54:02] to utilize the rail and the port in bulk shipments.

**From your previous projects, is it possible to read reports and statistics, if we want to understand and just grab the concept of what numbers we are looking at and dealing with?**

For the pellet project, we are looking at a hundred and thousand output which is about 5 ships a year. That's the biggest one we are currently working on. There haven't been other big ones. The other one was in breweries but they take a thousand tonnes of woodchips but they were all woodchips. And charcoal is quite big. They export about a million tonnes a year. So that's the biggest done. But charcoal has done a lot of manual labor in-field.

**The woodchips are basically consumed, or utilized in 3 fractions. So they use it either in a brewery, or Ohorongo cement or you convert them to wood pellets and then export them?**

Currently, the woodchips are only utilized in burning, in Ohorongo cement and the brewery. We tried to do ##[55:32] but doesn't work. Too abrasive. We are always looking at other options to utilize the woodchips. We also looked at bio-char to maybe use that. To increase the values and minimize the transportation and space we need. Because if have a higher offtake and the price, for example the bio-char in Europe trades for thousand one hundred euros per tonne. Get that back to the bush and the locals then you would get much more and you could process more bio-char than woodchips. I think the biggest thing is to add value to the wood in any kind to utilize in this stream.

**This brewery, may I ask where it is located?**

In Withoek. But we are not supplying that one. That's another company.

**Is it fermented beer?**

Yes.

**Is there anything you would like to add? Or ask? The idea of this project is to gather data from the real-time world to implement in the design. You think in future if we need some data or some numbers, you could?**

Yes sure just send me an email and I can see what I can do. It would be nice to just have a small description from you guys so I can send it to my boss.

The son of the founder, he is living in Germany. He handles everything from there. He comes here 6 times a year roundabout. But he is also very into utilizing of the bush and with him we are also working on the bio-char, checking options for that.

He drives an electric car. but yeah that would be great if I could get a project overview.

If it goes ahead, then yeah we are open to anything really.

**So the idea of this project is to have this project as a pre-feasibility study as we are also conducting case studies in other countries like Spain and Columbia. But we know that also the biomass sector knows that transport contributes for the major bulk of the costs of the end product pretty much up to 50 percent or something. But then there's no real-time logistic place, you are one of the first few we met. In other countries, there are no dedicated logistics or transport services handling biomass and so on and so forth.**

Yeah, that's what we are facing as well. We are looking for people that do it already but there's basically no one. So we have to try to in this kind of production and scale also, rather look at the mining sector, how they do it. That's where we got a lot of data from. Because mines are also like that. They are very remote and they need to take their commodity out by port. And that's basically where we got our data from regarding logistics. And currently they are more feasible than any other transport or way of transport. Also regarding storage and all that stuff.

**And do you think we can access this in public sites or something to get the data or is it super confidential or something?**

You can look into pit to ship. Their concept is also very, you can apply for biomass. It's an Australian company but they are all over the world. And their the concept would be container into container at the plant. if you have a bulky commodity into a container at the plant, put it on the rail, take it to the harbor, store it in a container until the ship comes, unload, take the container back. That's basically the concept for the bulky stuff. ##[01:01:25] which would go to the harbor and not so bulk anymore. But this container also applies to shipping in huge bins which are then collected by trucks with a hook then taken to the factory or to the place.