V: How would you define circular economy and sustainable consumption in one sentence each?

A: Circular economy is an economic system which creates great value and doesn’t have any negative ecological impact or negative social impact. It’s an economic system that takes out value leakages. Sustainable consumption is consumption that is almost 100% similar to natural systems in the way natural systems consume and create within an ecological system. So there are as many products as needed and there is no waste generated and everything has value. So, yeah if I would put it in one sentence sustainable consumption is consumption according to a natural system in which there is no waste created and no value lost.

V: How do you explain the future circular economy to others, for example clients, friends or relatives?

A: So, because all of these people are very used to the linear economy I explain it from:

Well, do you have a television at home? – Yes.

So, where did you buy the television? What are the reasons that you bought this specific television? And then they explain and explain and I say: Don’t you think it is a very ugly product that stands in your living room? Does it fit the design of your living room? – No.

So why did you buy this television? And eventually they will say: Yeah, I want to watch TV because I need the information. Okay, so you actually need the information and you don’t need the television. – Yes, yes.

So why do you buy a television then? So what I explain is – what if you would not buy a television you would buy information? And that could be a projector or an iPad screen or it could be a television that fits well within your living room. But you won’t own it and you would pay a specific fixed fee per month. And they go: Ah, ok, ok, that is interesting. And the more you pay, the higher the fee is the greater is the technology you get. So if you only want the information because you need information you pay for example just €20 a month and if you want to have a high end design looking screen that comes with high definition and everything then you probably pay more. And they go: Okay, that is actually quite interesting. And then I ask: what would the producer do if he would get a fixed fee from you? So how would he propose his products? They say: He would try to make it as cheap as possible. And I say: No, that is the main thing that changed! They can increase their margin by creating a better product. If somebody has a cheap fee and he wants to upgrade to a higher fee and somebody with a higher fee has a product left over they can just transfer it to the other customer. Or they can take out and reuse them in other TVs or projectors or computers. And then people start thinking and they are like: Oh, that is quite interesting. And I say: That is what the circular economy is about, it is about trying to create as much value from the product position that you are actually selling, in fact you are not selling a TV but information and you are just using the TV as an instrument. And how can you just use the instrument as good as possible. And that is how I try to explain it to somebody who have no clue about circular economy because then they can visualise it and suddenly they understand and feel how that could work. And then later on I say: Well, circular economy is about creating a system that doesn’t have any value leakages. As soon as you buy a TV you are going to buy a TV every 5 to 8 years. What happens to the old one? – Yeah, I bring it to the municipality, the waste department. That is very strange and also think of it when a producer has this great, vast knowledge on building a TVs and he puts huge amounts of labour into it, he puts in patents, he has to rent spaces and he has to create a distribution network and it has to get to the shop. This is all value he is creating and at the moment he sells it to you. All that value that is put into this specific proposition is suddenly transferred to somebody else. You do not keep control at all. And that is how I try to explain it.

V: So the key characteristics that you point are servitization element and the extended lifetime?

A: Yeah, I am just trying to point out where the value is. Are they only looking for information? They don’t need a television they only want information. And how could you actually create that in a manner… And of course, I also explain the figure that currently we have 1.8 to 2 billion people that have purchasing power of the middle class and that will soon probably go to 5 billion people that have that purchasing power. And we simply don’t have the resources. So, I do it in a combination but what I find very interesting is that I try to explain that you don’t have to do less, you can even do more but it is all about being smart in how you create it. So, where is the value lost and how can you gain that value or keep it within the loop? And it is also about shit is going to hit bad soon if we don’t change this linear process. Because we will simply have to many people who will want to live on that same level that you and I are currently enjoying. So, that is how I explain it because it shows how everything is connected and related. And people start to understand that they are not an independent individually acting person but you are connected to everybody else. And if everybody else decides to go for B while B is very bad for you and although you think of A it is not going to happen. Circular economy and why it is so interesting you have to try to make it sexy for people but you also need the ability to bring it up to board room level. You should always be able to sell it in a business proposition and in finance and in numbers and that helps the transition towards the sustainable society.

V: I think you already answered some parts of the next question. The next question is: How much have you been thinking about the future circular economy and when you imagine a truly circular economy, how would consumption change?

A: Hm, consumption would no longer be a status symbol. Consumption would be about providing yourself to satisfy the specific needs that you have

V: And why would that change?

A: Because ownership will change. For example, we come out of the 60’s, 70’s and 80’s and specifically in the 80’s and the 90’s it was very important for instance to own a car. Not many people owned a car so it was a way to define yourself as a person. To show your success. And see, we are still, although we are human we are still driven from an evolutionary point of view and that means that we still have the urge to move ahead and bring your genes forward to the next gene pool. And biologically it all has to do with who is the monkey on top of the mountain? So how can you make sure that your genes are sold to a situation that means bringing it to the next generation. That has largely been done, probably for tens of thousands of years, by ownership, by territory and what I think is that it is going to change towards status by knowledge and access. Currently it is about ownership and status by the stuff you have any the money you make. I think in the future it will be knowledge and access and I don’t think that money will be the most important thing. Of course you still have to dress nicely, comb your hair and brush your teeth but I think the main differentiator in the future will be knowledge. Knowing stuff, having access to… it could be other knowledge, networks, various services and that access makes you the monkey on the hill.

V: And if you think about everyday consumption? That is about the bigger concept of consumption. What about the daily consumption that consumers just do?

A: Are you talking about for instance groceries or?

V: Yes, for example groceries or things that people just buy spontaneously in a shop, from some retailer.

A: The question is will we still have retailers then. I think it could also be that we all just have printers at home or you just online have access to certain brands or stores and they know what you like, they know your interests, they know your social interactions so the groups you interact with. And they just create a fashion, and give you that fashion that fits within that group and makes you feel comfortable. And maybe there will still be physical stores to pick up certain clothing and to bring back certain clothing and maybe you also have printers at home where you print certain clothing at home or certain parts. There was one situation, I think that was 6 or 7 years ago when I was at \*company\*. I just started working within \*company\* and it was still divided in three business categories, so one you have \*company\* Consumer Lifestyle, which of course they see themselves as the big guys as they brought the TV and all those other products in people’s houses. Then you have \*company\* Lighting and they thought they were the big guys because they invented the lightbulb, not literally. And then you had \*company\* Health Care. We were all asked: Where do you think the future of the company will go? And I was the only one in the room, mind you this was 6 years ago, I told them \*company\* is going to be completely focused on personal health care and everybody was laughing at me and I was like why are you laughing at me? Consumer lifestyle you are old school, you are not interesting anymore because you sell products you don’t sell services, you sell products. Lighting, yeah light – China can do it better. And still with LED lighting, LED lighting is great but you still have a big problem with one of the resources you need to create lightbulbs and there is also only a fixed amount of resources that is available and I don’t see you move to the next phase. What is really interesting for people in the future is the value that you add as a company so what I see is that you are going to \*company\* and that you pay, say €400 per month and they are going to make sure that you are healthy. And that means that they are going to put sensors in your toilet, they are going to make sure that they check in a certain way how you breath during the night so that they know that you are healthy. You have to breath in certain products or machines with which they can check that you are still healthy and they are going to have access to your refrigerator and they are going to put high quality food into your refrigerator and they know what your blood and urine values are, they know everything about you on a physical level. And they are just going to give you the food that is going to satisfy you and you get like 5 options of recipes with which you create the food you like. The food has the nutrients that you need for your body is in your refrigerator. And once you have a problem, you get a heart attack, you are going straight to hospital into a \*company\* machine and \*company\* are not going to be about making you better, \*company\* is going to be about prevention. And look now where \*company\* is now. \*company\* is called \*company\* Health Tec and they are not only focussing on making you better but focus on your personal lifecycle – from baby to grave. It is strategy right now and that is going to be the future. It is a burden to go into the shop and look at 15 kinds of candy bars because your glucose level is low. There are 15 candy bars and you have to choose and then somebody behind the counter gives you the candy bar and you pay, it’s a burden. This is not something that makes me enjoy life. What makes you enjoy life? Unconditional love, being loved by another, creating more knowledge, adding value, feeling that you are adding value as a person. Those are commodities of the future. That is what sustainable consumption is going to be about. What can I add as a person and what are the tools that can help me be seen as valuable, to be actually valuable and to add value?

V: We are coming to the second part of the interview now, the one based around a sustainable business model. The value proposition of a business model is composed of the product or service a company offers, customer segments and relationships and the value for customers, society and the environment. What do you think is the role of these elements for companies in implementing circularity and sustainable consumption?

A: If you look at what companies currently mostly focus on it is margin. How can I make profit? And that is the first thing they think about. Where is the money? How can I make money? And then they start to think about if I can make money and the margin is there, how can I make it look like it adds value to the customer? So, they all think that they think from a customer need but most of the time they only think can I make a product that makes me money. And then when I found that little hook then I sell it as if I found a solution for a customer need. And what they should think of as the role of a company is at the moment when they develop a product or a service is this going to add value to somebody’s life? Truly add value to somebody’s life? Does it have a normal ecological impact? And does it somewhere down the product chain have a negative social impact? Those are the first things they should ask themselves. And then after that when all those questions are answered they should ask themselves – can I make money?

V: Do I understand correctly; you believe that the focus of companies should shift from making profit to thinking about the impacts and benefits?

A: Correct and why, because it forces you to be innovative, it forces you to think differently. And most companies are focussed very short term, they are all about ROI. If I want to have a viable business they should look further than 20 or 30 years down the line. And not think in these 2 to 5 years. You should think of your children or grandchildren.

V: So what you mean is that it is about long-term value and not just about immediate returns.

A: And what you currently see in most customer propositions is that they are trying to make it as cheap as possible. Because they are trying to win the customer by making it as cheap as possible against a certain quality that is acceptable. The question is – do people really want that? Is that driven because you want a certain part of the market or because people want it? These are two completely different questions. The reason that we have products that were created in developing countries that are so cheap because there are many hidden ecological and social costs. We all watch news at 8pm. We just saw last year the enormous amount of migration that came from Central Africa Central Europe. And everybody is like they should stay away because we have been creating our health system over years and there is not enough room for these people to also be a part of it. And actually, nobody asks themselves – why are these people coming here? And nobody realises that it is partly because of the climate change that half of the people don’t believe in. It is about giving developing countries the wrong incentives for more than 30, 40 years. Giving them constantly money instead of helping them develop their economical systems. Those are the reasons that these people are here and nobody asks themselves what is the reason that all these people come to Europe. I believe a company has the responsibility to base its value proposition in preventing these situations that are barely visible in 20 or 30 years. They are difficult to grasp for consumers because these processes take 30 to 50 years. Companies will actually have to practice what they preach. It will be difficult and it will require different skills and capabilities but if you don’t create your value propositions on one of those I don’t think you have any future.

V: What do you think is the role of customer segments and relationships in that transition?

A: I don’t see a specific different role. It is all about fulfilling needs. Of course, what you can do is look at which specific phase somebody is and what he needs in that specific moment. And build a value proposition around it, like I explained earlier with \*company\*.

V: So maybe more information flows?

A: Yeah, definitely. The difficulty lies in there being so much data about you, private data, that is going to flow towards a company and I think those are the big challenges and I believe that not many people realise that knowledge is going to be the future currency and everyone knows everything about you. Knows your genes back and forth, that knowledge can be used differently. I think managing this personal data will be one of the big challenges of the future.

Customer segmentation – I think there will be a different customer segmentation depending on how you are going to build your proposition and it will go further and deeper. We are going to truly know our customers instead of putting them into certain segments. I don’t think there is going to be segmentation anymore. It’s going to be individual marketing specifically for you. So we know that a person has certain genes and therefore a chance of getting a specific disease and therefore we screen that person in a specific way. We know if somebody is likely to develop diabetes, we provide food accordingly and therefore the person doesn’t develop diabetes.

V: That is a very interesting perspective. Okay, so we are coming to the next aspect of the business model and it is value creation and delivery. This question is about the aspects of value creation and delivery of business models. Companies’ activities, the resources they utilise as well as the distribution channels, partners and suppliers, product features and technology they choose feed into this. How do you think companies should develop these elements in the transition to a circular economy?

A: So, company activities - first of all I think they should go from reactive to proactive. I think that many companies are still in a reactive state. What do I mean by reactive? Trying to create an environmental report according to the GRI rules. That is reactive. They do it because they don’t want it to be a negative image builder. There is still a lot of greenwashing even within \*company\* I see that. So I was thinking how are we going to communicate this to not be seen as bad. I think those activities should be fully integrated in everything you do. One of these activities be – where do our environmental burdens lie? Where does our negative social impact lie and you can almost say – where do we have value leakages? And you have to be utterly aware what those value leakages or negative social or environmental impacts are. Why? Because it is a risk factor. So, the first activity should be to assess where are my risks in the future? In 20, 30 years ahead. And if you know those then you can see is my current value proposition actually adding value or making the world looking shittier?

V: Okay, it is also about other activities the company conducts.

A: I think first you should… I think what companies still do is trying to look less bad. I think you should really honestly admit where do I not perform well or where do I perform in a certain way that creates a risk for the future? I think that is the most important thing. Currently we kind of know where we perform like shit and then we tell a story that we don’t perform like shit. That is greenwashing. That is the first, second is resources. So what are the resources currently used for my product? What resources do you use and what will be the outcomes of these resources in the next 20, 30 years?

V: Do you mean by outcome of the resources the end of life of the product or whether we run out of these resources?

A: Currently, if I am building a product I need stuff to make it. I need material, I need labour, I need energy – so what do I need to build a certain product? It could be certain plastics and so on. In a transactional world, we look at build and material costs and we put a margin over it and we just sell the product and the margin is going to be our profit. So, I think you should look at what resources am I using totally and not from a cost perspective. Then you can translate it to certain costs and you should translate it to costs for society, to ecology as well. So, you do have the monetary costs for the business per unit and the costs that are actually transferred to society or ecology. Those are the resources, then the third would be distribution channels.

V: I just try to summarise what I understood you said about resources; first of all, you think it is important to assess resources taking more factors into account, not only the costs. And then – what is the next step?

A: That is also part of the risk management. You should then ask yourself could the proposition that I built do without those negative impacts? How can I change my proposition to not transfer negative impacts towards society and the world we live in? We are so focussed on building something from a segment point of view… so a product designer is mostly focussed on making a television screen look super sleek. And the guy who has responsibility for distribution just really wants to have the product packed in a certain way that it is not a DEVOA. You know what a DOA is? It is ‘Dead On Arrival’. So, he wants that the product looks just as neat when it comes out of the store as it does when it comes out of the factory. So the way it is packaged. But it is also looking to trying to keep the costs of distribution as low as possible. Nobody is actually thinking of why should we build a product in China that we ship to the other side of the globe and that product only costs 10 cents. While if we would make it locally it would cost €1 and yet the product from China is sold for €1.10. Why would you? That is because the margin from €1.10 to 0.10 is just so much better. There is an incentive to get the product from China although it has a greater negative ecological or societal impact. I believe that the global distribution will be heavily developing towards local distribution. That is because the large driver behind long physical distribution chains is that labour is so cheap in China and other countries like China and maybe in the future Africa. Resources will be so valuable that you always want to keep them close to you. You will never throw away your products. Your product even if it is not functioning still has a high value because of the specific resources in there.

V: Are you talking about the value for the companies or for the customers now?

A: That depends on whether you still use a transactional model because I expect that there will still be transactional models in the future but as long as it is part of a flowing, local network transactional is not a problem. That is the same for bottles, even though it only holds 10 cents you still bring it back to the supermarket. I think distribution channels will be far more localised. Examples of those are for example what you can do with additive manufacturing. You can print highly complex products like for example a phone, including the electronics. I don’t see why we need China or another cheap labour country to build valuable products.

V: So you are saying materials will flow on a more local level while information and information exchange still happens on a global level.

A: Yes, of course. Resources will be like time. We have been using resources during these past 150 years as if they were abundant. And you see what happened.

V: How about partners and suppliers? What do you think is their role in the transition to the circular economy and in achieving sustainable consumption?

A: I think it is the most important role.

V: Can you expand on that? What is their role?

A: They are going to be facilitators. If you want to bring value to your customer you cannot do it by yourself. You cannot control the complete supply chain of the value you bring by yourself. So, you are going to need municipalities, people who have access to or knowledge of certain things. If a product breaks down it might be as well that you use a completely different company to fix your product.

V: Do you mean a company collaborates with another company or the consumer just goes somewhere else?

A: It could be both ways, I believe there is not going to be a clear supply chain or clear partners anymore. It’s going to be more like an ecological network. What we tend to do when we create a supply chain or a distribution network or partners, we try to make a straight line where everyone has certain tasks to create eventually the value you create. I don’t believe in that anymore. In the future; it is going to be more of a network and you use small parts from all kinds of products and services to create the true value. Each time you do that there is going to be an exchange. It could be a monetary exchange or a resource exchange which makes sure that everyone can fulfil their basic needs to survive. If you look at an ecological system... I think it is going to be more symbiotic. They work together and they benefit from working together while they have completely different needs and goals. And also the way currently monetary exchange is taking place it is still done by cash or by using a card that has an account behind it that counts either up or down. If you look for instance at the bitcoin way of doing business it already goes a step further and has more freedom in exchange. In the future, there is not going to be one fixed monetary way of exchanging value, to buy or sell value but there are going to be several ways in which you exchange value and that makes it also possible to have a more complex, integrated network with partners. Even with partners that you don’t even see as a partner even though they are there. Exactly as what happens in an ecological system.

V: Then there is only one element left under this aspect and that are the technology and product features. What should be the role of technology and product features in the transition to the circular economy and in stimulating sustainable consumption?

A: It is going to be huge and I think especially faculties like IDE are going to be enormously enablers. By creating easy access. It has to look fancy, it has to feel futuristic.

V: Are you now talking about products, IT surfaces…?

A: Everything. It could be a product, it could be a car, it could be a train. Everything that you do is all about what it looks and feels to the user. Look at an iPhone – it is just a sexy product. Look at this Mac and it is not even the most ecological alternative, but it looks like a sexy product and it makes people feel happy. It makes me feel happy because it is nice – it looks nice, it feels nice, it interacts nice. It doesn’t really matter what, you can design a product but you can also design a process in a way.

V: So, you mean it is really about making a product attractive and not pointing out that it is very ecological.

A: It should not ever, never ever be marketed as a green product. It should be marketed as a product that fulfils your needs and the whole green thing shouldn’t even be an issue anymore because it is natural that you make products that have no negative ecological impact. People have the intrinsic tendency to constantly create, to move ahead, to develop, to create new. I believe that we can’t get away from the technological cycle as we know it right now. We can’t think: this doesn’t work – let’s go back to the stone age. It is not going to work. The future is going to be heavy urbanized areas. Cities are going to be the future and that means that you are going to create an infrastructure and an experience that still feels natural.

V: With products and technology?

A: With products, with infrastructure, with networks, virtual networks, buildings standing tall but they should be green and have trees all over the place and have natural air conditioning. But it has to look sexy. But it should be the natural thing to do. That is what you have for instance with an Apple product. It is very natural and it is very instinctive, it fits within the way people think.

V: Then we have the third element of the business model – value capture. How should companies capture value in order to achieve circularity? The first element is cost structure and revenue stream.

A: It is all about recurring revenue streams in the future and cost structure is about managing your processes in such a way that it doesn’t create any leakages and the less leakages you have, that have negative ecological or societal impact, the lower your cost is going to be. In the future, I expect the governments in the world are going to put a tax on ecological deterioration and will make you pay for negative societal impact. The only way to keep your cost down is by creating positive impacts on all three levels; so economically, ecologically and societal. Cost is going to be about creating added value, your processes in a way that create added value and that it is natural and easy. And you also probably need a lot of partners and I think even competitors will cooperate with each other to bring costs down. Revenue streams are all about creating recurring revenue so it is going to be long-term customer relationships. The best thing they would do is that people don’t even think about it when making a choice but seeing it as a natural thing to be there.

V: So are you referring to monthly payments rather than one-off payments?

A: Yes, or payments truly on usage basis. What I currently do when I need to park my car, that is a specific moment that I need a parking space and pay for it. It depends a bit on when your customer demands it. So, I can just decide I pay €100 per month and I can park everywhere and never think about it or I only park 3-4 times per month and only pay when I am using it.

V: Okay, the next element is value capture for the environment and society.

A: It is the same as cost structure and revenue streams –in the future value leakage will be a concept of the past. So it is going to be very normal to capture value because it keeps your costs down.

V: So what kind of value can you imagine that will be or should be captured for the environment and the society?

A: As long they instead of having negative impact are having positive impact. For instance, we’ve been living for such a long period of time on credit with our environment and there are huge amounts of grounds here in the Netherlands and elsewhere that are heavily polluted so why wouldn’t you for instance just take away that pollution? Why do I only see 9 trees when I look out of this window? Why aren’t there trees all over the place? One of the success factors for companies will be that you operate in an environment that makes it possible for you to deliver your value. So, I think you should look further than only the product proposition. For instance, if I sell sport shoes I need people that are healthy and fit because people that are healthy and fit are going to need sport shoes. So, you have to think further than only selling the sport shoes with great pictures. No, you actually have to go further and create an environment in which people are able to use sport shoes so for example build sport tracks. So, if you buy or lease my sport shoes I’ll give you access to the local sport tracks and I’ll pay that for you. And when you’ve run more than 150 miles I have another pair of shoes ready for you straight away. So not just selling the product and what it does, so the ability to run but also add those features like I give you access to the sports track. Or if somebody who buys these sport shoes is obese than you are very concerned about that person’s knees so the staff in the shop could explore that person’s motives for buying these shoes and offer another proposition. Because these shoes give you access to a sporting track but they also give you access to somebody who knows how to build up your condition and it gives you access to somebody who can give you dietary advice.

V: There is one last aspect, how do you think the growth ethos of companies should change in the transition to the circular economy?

A: Currently our whole society is built on creating debt and therefore you can just grow and grow and grow because you just create more debt but that is not sustainable. So, I think you should be looking toward natural growth. But it should also be that companies say; we are at the limit of our growth and this is how big we are going to be. If you live in an environment where there is a lot of food in summer and little food in winter, then you are going to eat all the food possible in summer and become a bit fatter and then in winter when there is hardly any food you are going to use that fat. But suddenly we live in a society where there is always food. But is it good to keep on growing and become fatter and fatter? Does that imply we are having a better life? It doesn’t; we get diseases, we get problems with our bone structures, problems with our heart, all sorts of problems. So, growth should be looked at as in whether it is natural and fits the natural system. Is it going to add more value? No – then stop growing. If growth would be based on the amount of knowledge or the amount of access you have – then just keep on growing. As long as you have more knowledge it improves a lot and if you have better access too, it doesn’t imply that you have more negative impact. The problem with thinking from linear to circular is that we are so used to thinking in certain definitions. People find it very difficult to understand the holistic system of circular economy. If you would say you have to grow as a company everyone would think you have to make more money and increase your market share. Why shouldn’t it be: I am trying to add more value and become more valuable for my customers? But it also depends on how the economic system develops in the future and I don’t think that circular economy will be the way in which it will be handled. I think it is just a concept that helps us to think differently about our economic system, that helps to transform towards a system in which everything is in balance with itself.

V: This leads nicely to the next question. This one is about really imagining a truly circular economy. Just one quick question first, do you feel there is an element missing in the business model?

A: No, not directly.

V: So, how can circular business models lead to sustainable consumption?

A: Because it fits naturally within the system. Circular business models are all about taking away any negative impacts and now it is even about creating positive impacts. If you would implement a truly circular business model it would definitely create that added value. But in a world which is in transition it is as you can see still about doing less bad. What the good thing is about circularity is that it implies when you do it 100% that you go 100% to a sustainable society. Truly circular business models should lead automatically to a sustainable society. Everything is looped, it is an ecological system - there is no waste.

V: Okay, then we come to the examples. Can you think of one outstanding example in which some of these business model elements played a role in the transition to the circular economy?

A: For instance, when we used within \*company\* this model of circularity, so I am talking about the butterfly model of the Ellen MacArthur Foundation. Previously, \*company\* was looking at refurbished medical equipment not as something to capture value that has already been created but about capturing new customers and creating more linear transactions. Certain old medical systems were bought and that would help to sell new medical systems. Those old systems came back and instead of throwing them away they just pulled out 90% of all the material in there and then just made a new product out of it and they were also used to make more linear sales. And also, if a hospital really wanted to work with \*company\* and purchased the most expensive one but they need not just one but they need several different medical machines. Then half of them would be refurbished because they would be used as the work horses and the other half would be the high-tech solution and they would be used for instance in medical university institutes in which they just really needed the latest and the greatest. So, what we’ve done is that we used the model to show where the position of refurbished was. We showed in the model where new medical equipment is and then we showed them here is the service and we only capture half of the value. Of all the medical equipment that was sold by \*company\* half of them would actually get a service contract and the other half would be serviced by the hospitals themselves or an independent service organisation because they were cheaper. And we just looked at all the loops and instead of focussing on market potential we showed them where they were losing and showed them where the value was lost. Also, if you pull out 90% of all your material and you just throw it away and on the other side you have a service organisation that uses these parts and has to take a huge amount in stock as they can only be supplied for 5 years but your medical equipment runs for more than 20 years. So, you have to do a last-time buy, so you buy material that is also in your customer field, your installed base. All the medical equipment that you have sold and that is somewhere in the field. So why should you actually keep it in stock in your own warehouses which costs money and is completely against the just-in-time way of organising your supply chain. So, just by using a model we showed them where value was lost and it helped them to think differently. And eventually we were in such a phase that the marketing department, that is actually the one that describes the system requirements of the new systems of the future, came to use and asked how can we develop these medical systems in such a way that it is easier to remanufacture, refurbish and harvest parts. That was easy, I just want to see a medical system in the field and see what the status is of all these different parts and as soon as a system comes back I want to know exactly what the quality of that parts is. If we can easily reuse it and if we cannot reuse it, if we can use smaller parts for other parts or we can just recycle it. Suddenly everyone started thinking: Oh, I am part of a wider thing and that it wasn’t about an independent business metrics society where it is all independent organisations. They were all thinking: I am part of a bigger thing and what I do here has impact there. Previously refurbished was seen as a possibility to make more transactional sales and suddenly it transpired that refurbished is part of that pie that closes our loop and offers so many more tremendous possibilities to save cost. And because it asks to look completely different how you look towards your value proposition because nobody thought that stock and installed base are kind of the same thing. Nobody thought to link those together and installed base is actually stock that you have already sold but you can just buy back. And it would be even more stock if you sell it as a service proposition. Did that answer your question?

V: Yes, as far as I understood the company changed the product-service offering, their distribution channels to a certain extent, the partners and suppliers they are working with to achieve circularity.

A: Yes, and what we found out was that setting up a reverse supply chain was one of the biggest issues. We are really good at forward supply chain but getting it back… But also, the teams that were doing the installations of the medical systems; the way they installed it was great but all the stuff that was left over, they just threw it away. What we found out is that that was more than 10.000 worth of new material thrown away. Simply because nobody was thinking in a connected way and those installation packages are standardised and nobody was thinking about returning leftover parts. Also, large medical equipment, for example interventional x-ray, is delivered on specific frames. They were heavy frames made of metal and they were so strong you could easily reuse them but they were built in such a way that they’d pull out the frame, use everything and threw it in a container so that you couldn’t reuse it anymore. But then I said; you could build a frame out of wood that you could reuse locally and not just for biomass or you should redesign these metal frames so that is easier to reuse them. And suddenly because of circularity things were popping up everywhere. Refurbished systems were actually quite low in the organisational level but we were actually touching all aspects throughout the organisation in certain business units that were not even communicating with each other. One simple example; when you develop a medical device, it is very heavily regulated and you need to make a complete device master record, what actually goes into your medical device. And after that you have to create a device history record, so if there are any changes to the original. Those two weren’t linked so actually the factory that made the machine made the device master record, the machine then was sold off to the clients and 50% of those machines went off to the service organisation of \*company\* and they did not have a connection. And as soon as the machine was coming back again and it entered the manufacturing system again we didn’t know what the service department had been doing to the device. An x-ray tube costs €100.000, they are very expensive and last for 5 years. A medical equipment is mostly used for 12 years and it could be that certain medical devices already had the third tube because they were having more patients than normally and an x-ray is not about the number of years but the number of times it has been used. And it could be that certain medical devices were coming back with a tube that is only one year old. That tube has an enormous value. So, what happened was that we were competing with brokers that were actually trying to obtain as many medical devices with the x-ray tubes of \*company\* as possible and even if they were not new, it didn’t matter to them. And they were selling these x-ray tubes on the second-hand market for €30.000 to €40.000. For instance, when a hospital was in the situation of having an end of life system and they didn’t want to buy a new one these brokers would come in and offer a second-hand system of unknown quality for €30.000 to €40.000. They gave a 6 months’ warranty, so if it breaks down within this time they would provide another one without an additional payment. They had stocks of x-ray tubes and those tubes were not put in by \*company\* personal. And that was actually a liability because if a patient would die on that table it would be our [\*company\*] responsibility. We showed those kinds of risks and everyone was really shocked and said we have to change our business, we have to go to a service. And suddenly the guy from IGT, which is a 1.4-billion-dollar business, said we are not going to sell our systems anymore in the future anymore, before 2020 I want 80% of our systems based on a service proposition. So, everyone started thinking because suddenly the risks came on the table and we showed the connection. And suddenly a new guy came into refurbished and said ‘you are doing stuff for the rest of \*company\*, not under me’ and we got kicked out.

V: Oh, I see.

A: And this is typical linear thinking. Oh, I have to pay for it and you are going to bring value for the rest of the company – I am not going to pay for it. That is very said but it is also a perfect example for the various problems we run into. And then some guy who is the manager of a small business unit has the power to kill something that has a positive impact on the entire organisation. Because he didn’t believe in it, he saw it as a belief.

V: That was a really interesting example. Drawing on this example, to really achieve full circularity what would and should be the next steps for these companies in your opinion?

V: To really achieve full circularity what would be the next steps?

A: Put a price on ecological deterioration.

V: But that is policy and not from the company perspective.

A: Take away tax on labour and put a price on ecological deterioration.

V: And what should the company do?

A: But that is the main incentive to immediately change the business model? That would change everything in a heartbeat because if that would happen you get a completely different competitive field.

V: But assuming that something like that had been implemented and that companies really switch to that and for example for \*company\*, what would be the next steps?

A: Ah yeah, next step is what am I actually trying to do? - I save people’s lives on the table. How can I even prevent them on the table? I think what would help is thinking about how can I put the the proposition that I brought to the field in a situation that it is no longer needed? I think you should always try to put your value proposition in a situation that it is no longer needed. Because that means that you are developing yourself towards creating new value propositions. That requires innovation. It is no longer about fear or reaction but truly creation. You have to put something into the market that puts you out of your current business. I have worked for the ANWB, that is a road assistant service and the ANWB is basically an association and this association is all about creating value for its members. Part of the ANWB is road assistance. The membership is based on the road assistance as everyone needs road assistance which actually legitimates the whole ANWB which is a form of blackmail and if you look truly at the goals of ANWB – it is contrary to what they were doing. So I was secretary of the CFO in ANWB and he asked me: What should be the future of the ANWB? I said: I think you have to take out the road assistance of the ANWB because those are contrary. And he said: Yeah, but it is the cash cow. –And that is your problem. That is why you always will be in a stretch. That is why you always will go again your own goals and visions. What you intend is to do the best for the environment whereas the membership is about creating more cars on the road because your membership depends on it. Because that is where they make money. Our society is built on protecting and I think we should move away from that and go to full creation. Not being afraid of losing something that you have.

V: What do you think will be the key differences in the way business will be done in the circular economy from a user or consumer perspective?

A: Monetary exchange will not be the most important thing. I think the money aspect will be taken out in the future. It is probably still used as an instrument but it is a tool. Currently money is seen as the most important thing and I think that is the biggest barrier. Also in the way it is organised right now; we don’t put a cost-price on ecological-services, we don’t put a cost-price on negative social and environmental impact.