V: How would you briefly define circular economy and sustainable consumption in one sentence each? #00:00:11-5#

M: I would define a circular economy as an economy in which materials, energy and other resources are used to make products and provide services and after those products and services are used, the materials and energy and other resources are again available for use. Sustainable consumption is consumption at a level that is within the boundaries of the circular economy. You are not consuming resources at a rate greater than they can be provided. #00:00:59-2#

V: How do you explain the key characteristics to others? #00:01:18-0#

M: I ask them how old they are. And then I ask them for something they are made from and typically they say that they have water or carbon inside them. And I ask them how old is that water or that carbon. And they usually stop because they haven’t thought about that before and I point out that that element or molecule is somewhere in the order between 7 and 11 billion years old and nature has reused those resources to produce our current generation of beings and we must learn to do things the same way so to use resources over and over so that the societies we create are sustainable. #00:02:17-9#

V: That is a very interesting explanation of the circular economy. Now imagine a truly circular economy - how do you think would consumption change and why? #00:02:32-9#

M: I am not sure how much we can actually direct consumption. Certainly, one would hope to see reduced levels of consumption so that we can more immediately and effectively create a circular economy but I think a large burden lies on companies to design products in a circular way so we need to stop making disposable materials, using resources like petroleum to make plastic products that are then discarded and instead design the products for either collection and recycling or for multiple uses. I think it is incumbent on industry in cooperation with government to set up very convenient recycling infrastructure so there is no question in an individuals’ mind about what can and must be done with substances after it’s used once. And things simply don’t get thrown away. We also have to look at how we obtain and use energy if we continue to take sequestered carbon and burn it to release energy and also to release carbon dioxide into the atmosphere we are disrupting the natural carbon cycle that has reached a point where it can sustain a form of life on earth critically our form of life for the past few hundred thousand years. That disruption will make it more difficult for us to sustain ourselves so we have to learn to use energy that comes from the sun that is renewable and given to us in a daily allowance and if we live within that allowance and if we constantly reuse our materials we have a much stronger basis for a circular economy. #00:04:55-3# #00:04:55-8#

V: So you imagine that it will be consumption based on less material and energy input. #00:05:05-7#

M: In collection of the materials after use so they can be reused - that is absolutely critical. #00:05:16-6#

V: Now we are taking about different aspects of the business model. I would like to know from you how you believe companies, for example \*company\*, should shape these elements in order to transition to the circular economy. How should companies shape their value proposition when implementing circularity? #00:06:08-4#

M: I don’t believe the consumer has a consideration of circularity or other environmental considerations when they consider the value proposition of a products. Some do, there is not one consumer there is a range of consumers. You have what you call the dark green consumer who probably does pay more for products that can advertise their circularity or their low toxicity but most consumers look at the value proposition of the getting a good or service at a price that fits in what I call the price-service-continuum. Some people buy Volkswagens, some people buy Mercedes but depending on the amount of money they spend they expect a certain amount of service and I don’t think circularity changes this very much. I think consumers have an expectation that companies will do what is necessary to ensure sustainability. It is like quality in a product; consumers expect companies to take care of that they don’t see that as part of the fundamental proposition and when a company fails the consumer in that regard the consumer turns away from that company. #00:07:52-2#

V: And do you think companies should change their products and or services? #00:07:58-9#

M: Absolutely, I think companies need to move away from models that externalise costs and start to design products and provide services only within these structures of a circular economy. There is a level of irresponsibility in every company that designs a product for single use and disposal. Companies have an obligation to see that products after their use are either reused or recovered for the value of the materials and energy embedded in them. #00:08:50-1#

V: So, you see a major shift in how the products are designed in regards to how they can be reused and recovered? #00:08:55-8#

M: That is correct. And I think industry working with governments need to create the infrastructure necessary to recover those materials. #00:09:07-4#

V: And do you think the relationships of companies with their customers should change and will change in the transition? #00:09:16-8#

M: I think it will change, as I mentioned before, consumers have an expectation that companies are not destroying the earth or are bringing harm to them through use of toxic materials or ignoring issues of quality etc. Those are just part of the expectations that consumers have outside the price-performance of the product. I think when a company disappoints the consumer by demonstrating a lack of concern for the environment or human health then they turn away from them. The most recent and unfortunate example of course is Volkswagen. #00:10:19-3#

V: What do you think companies should do regarding their value proposition not only for their customers but for the wider society and the environment? #00:10:31-8#

M: I think that is mixing two issues, again I see the value proposition as being an offering of product or service at a price and then delivering a product or service that meets the consumers expectations at that price. I see the issues of social responsibility, circularity as being fundamental to the companies’ operations and I think companies should certainly talk about that. Talk about the need for doing that and make consumers more aware than they are now of the need to do that and I think that that could shift consumer expectations of corporate behaviour and I still expect the same price-performance equation from the company but I think they will then start to turn to companies that deliver on that circularity. #00:11:44-5#

V: One question regarding \*company\*; how much is \*company\* currently involved in circularity? Is that up on the agenda or is it more general sustainability rather than the concept of circularity? #00:11:55-4#

M: It is fundamental to how we design our products and conduct our business. Our products are typically cleaning products or paper products, baby diapers and our objective is to have 100% of the materials reused, come from renewable or renewed sources so all of our packaging from recycled plastic, all of our materials either from bio-based or recycled sources and then all of the packaging we make and all the ingredients for our products either recyclable or bio-degradable so that you can tie into something like the carbon-cycle to renew the material so that is fundamental in our design thinking. #00:12:58-0#

V: Are there currently activities to implement aspects of circularity? #00:13:03-8#

M: What we do is we look at our total purchase of materials and categorise each of our materials as either bio-based or recycled and right now we are somewhere in the 80% range of materials falling into those categories. Everything else is either a virgin plastic material or a petrol-based chemical and we are trying to reduce that. On the other side we want all of our materials to be either bio-degradable or recyclable. Our packaging right now is something like 97% or 98% recyclable and we are working to get that to 100% and our products are in the order 60-70% either bio-degradable or recyclable. With the biggest outliers being our baby diapers which right now just go to landfills and also baby wipes and we are working to develop a 0-landfill baby diaper - that is one of our ongoing projects. #00:14:30-0#

V: So you are trying to develop new materials with good properties to be used as a diaper and also going back into the material cycle. #00:14:37-1#

M: Exactly, we have as societies developed these very widespread sanitary waste systems; we collect waste water, we have septic systems, we have municipal waste water treatment systems and that is where the bulk of human waste in developed countries goes. The question we are trying to ask; is there a way for us to make a diaper that ties into those sanitary waste systems. In the current paradigm it would have to be flushable, not clog a toilet and then bio-degrade within the waste water treatment system or septic tank parameters. #00:15:37-0#

V: That would be really cool. #00:15:39-2#

M: We are working on it. #00:15:39-2#

V: It would also have the convenience aspect as you wouldn’t need a bin for the smelly diapers in your bathroom. #00:15:54-0#

M: Exactly, some thoughts we had are to use plastics and absorbent materials that can be degraded enzymatically so your smelly bucket will have enzymes in it that will dissolve the diapers and a little pump would pump the sludge into your toilet bowl and you would flush it away. #00:16:17-5#

V: This feeds nice into the aspect of product features of the sustainable business model. Do you have more thoughts in how companies can use technology and product features in order to achieve the transition to the circular economy? #00:16:43-1#

M: I think what comes first is the mindset of designing the product in a way that ties it into a circular system, either a system or recycling or a system of bio-degradation and bio-renewal. Once you have created that mindset you look at what consumer needs are and then design a product to meet those using the tools of circularity. #00:17:23-1#

V: Can you think of how other product features could assist in the transition? #00:17:32-0#

M: Well, that is a much broader question and highly dependant on the kind of product we are speaking of. One thing we think that has to happen is not product design but infrastructure change. For example, \*company\* has very aggressive greenhouse gas goals for the next roughly 12 or 13 years. We have 20-30 goals that want to get us to very low levels of greenhouse gas emissions and because much of our product is used in a washing machine with hot water we could tell our consumers to use cold water but there are limitations to that. It is actually more effective to clean in hot water so we have to design a much more robust product and there are circumstances when you want hot water. For example, when people wash the dishes at the sink it is very uncomfortable so what you really need to change is not the detergent but the way you heat the water. Because if we were heating the water with renewable energy instead of fossil energy this wouldn’t be an issue. We see our goal for the next 10-12 years as promoting change to our energy infrastructure because we are not going to be able to succeed in making a circular economy just by changing our product. Same is true with materials recovery facilities, right now in the United States we have an extremely inefficient method of recovering used materials for recycling. We call it curbside recycling and personally I think the companies that designed this said: What can we design to make a system that won’t work? So that recycling will die and we won’t have to worry about it. So we need to design packaging materials and products that are easy to recover and create the infrastructure to recover these materials. In the United States is what is called single stream recycling where the consumers throws everything in one bin and then at the materials recovery facility it is again separated. Well, you know about entropy so you are increasing the entropy significantly and that means you have to put in energy for an effective separation if you just had a bin that has 3 compartments, as they do in Europe, so that people maintain that separation, it reduces the amount of energy you need and maintains a cleaner waste stream etc. and people would then need to be trained to use these properly. I think we have a lot of work to do, increase of infrastructure to support a circular economy. #00:21:40-3#

V: What do you think should be the role of partners and suppliers in the transition? And maybe you can also tell me about your personal experience from \*company\*. #00:21:48-5#

M: Partners and suppliers are absolutely critical because they are often are the ones that provide you the technology to move forward. So going back 12 or 15 years; we were looking for bio-based chemicals and very few of our suppliers produced them and now almost all of our supplier produce them. 15 years ago we had a choice of 2 companies today we have a choice of half a dozen or a dozen companies. Suppliers also apply their technologies to help us achieve our objectives. Enzyme companies making cold water enzymes for us so our products work more effectively in cold water. We have one packaging manufacturer who has been extremely supportive in the use of post-consumer recycled plastic. Many other companies did turn away from us because of the difficulties of handling PCR plastics because they are more temperamental than virgin plastics. But this one supplier worked with us to make most of our bottles 100% PCR and has been critical to our success in that area. #00:23:28-5#

V: And have you developed and new collaborations in this transition or are you planning to develop any new collaborations? #00:23:35-5#

M: The answer is: Constantly. We are constantly looking for new materials and new ways to use those materials to create greater circularity. I am trying to think of some good examples. Recently we went to anew label manufacturer and in choosing this manufacturer we did not only look at cost, turnaround and quality of their products but we asked what sustainability programs they had in place that we could talk about when we sold our product. We use label materials that are recyclable with the plastic bottle or separate easily from the bottle if it can’t be recycled with the bottle. The companies we work with often have robust programs for their communities. They see themselves as a part of a communities rather than just the community being where they are located. This is extremely important if you are going to create sustainable and a circular economy because you want the company to feel an obligation to the community to pay good values, to maintain a minimum of emissions, to maintain the health of the community etc. So those are some of the things we look for and as I say it is a continuous process. #00:25:26-6#

V: What do you think are the key resources in the transition and how they should be used or shaped? #00:25:43-0#

M: Obviously, we need our design chemists and engineers with the mindset to create products, packaging and services that fit into a circular economy. We do have that it is really excellent. We also need our business leaders to have the vision that this is the company we need to be and who are willing to manage the margins on our products and other aspects of our business so that we have the appropriate margins so that we are a financially sustainable business. A lot depends on our suppliers and the relationships we have with them and their ability to understand what we are trying to accomplish and their willingness to look at what might be a more expensive process initially and rely on us to promote the technology so that it becomes more mainstream over a period of time. A good example for that again are some of our surfactant manufacturer who 10-15 years ago had very limited bio-based offerings. They made the bio-based offerings available to us knowing that we would tolerate a slightly higher price to cover their higher costs but today the demand is so great that that differential is much smaller than it was 10 or 15 years ago. Its companies who see the need the need for changing the paradigm of business to create more circular economies and are willing to invest in changes necessary to do that. And then of course it is dependant on governments to set policies that create either a level playing field or even give emerging technologies a slight advantage. For many years there have been subsidies for renewable energies. Here in the US we have talked about a price on carbon. California has implemented a carbon cap and trade system. In New England we are talking about doing something similar. I don’t know whether Europe has implemented such a system yet. #00:28:33-5#

V: I believe there is such a system in Europe. #00:28:54-8#

M: So these things are necessary to promote the changes that are needed otherwise a purely capitalist market we tend to the status quo and externalisation of costs what is bad for the environment, typically bad for communities and individuals. #00:29:24-1#

V: Okay, now we are coming to the next aspect - value capture. How do you think will and should cost structures and revenue streams change in the transition? #00:29:53-1#

M: I think what we will see is a shift from the current paradigm of extracting materials from the earth as cheaply as possible to a paradigm of accessing materials from recovered streams and that will become the norm so that we will rightfully have less dependance on extracted petroleum and other minerals but instead we will have recovered materials to work with and also bio-based materials. As you know there is a huge interest in pursuing bio-based energy. I think that is a necessary transition. We are looking at soy, palm and other bio-based oils and I think once that transition is further along what I call the feedstock industry which is just a few percent of the total use of these oils will benefit we will see much lower cost for bio-based materials. And then bio-degradation will become extremely important to create that circularity. #00:31:34-3#

V: Giving the nutrients back to the bio-cycle. And what do you think how revenue streams should change? #00:32:00-7#

M: I don’t see a big shift there unless governments impose some sort of price on fossil technologies I think consumers are still going to buy products based on the value that they receive or the performance they receive at that price. I see a bigger shift in how consumers purchase goods and materials away from retail establishment and more towards online purchasing. I think this fundamental value equation remains the same. #00:32:56-0#

V: And what do you think about the growth strategy - should it change and have you maybe seen change within \*company\*? #00:33:03-1#

M: So \*company\* has very large growth objectives and I think that will continue and our growth is on the expense of conventional brands. I hope that reflects the recognition by consumers that they need to look to companies to have a stronger environmental and human health ethic and that things have to change. But again I don’t think circular economies will succeed by limiting the availability of products choice or by moderating purchasing. I think rather circular economies will succeed by providing consumers with the goods and services they want in a way that materials are recovered and reused rather than simply taken from the earth and discarded. #00:34:19-8#

V: So growth will still happen but maybe that companies that are doing ‘better’ are growing at the expenses of companies that don’t really buy into the idea of circular economy. #00:34:36-7#

M: That is correct. #00:34:42-6#

V: How should companies capture value for others - so for the environment and the society and how do you measure that at the end? #00:34:51-9#

M: We have what we call our aspirations and I would hope that our aspirations are based on creating value for society. So for example having all of our materials come from renewed or recycled sources, making all of our products to be recyclable or bio-degradable. We have an aspiration to transform commerce so that there is greater transparency along the supply chain and we also have an aspiration to build communities. So that human value is recognised throughout the value chain, people are paid a living wage not merely a minimum wage and that people have freedom of assembling and all these other things. I think companies need to embrace the social values that I hope are universal in terms of human rights and health and well-being and not merely exist for the benefits of their shareholders. Companies today here in the US they are required to have a board of directors with a fiduciary responsibility solely to shareholders and there is a movement to create what is called B corporations where the board of directors has an obligation to the shareholders, to employees, to communities, to the environment and I think until companies are all built on these benefit corporation principles companies cannot be a reliable force for good in our society. #00:37:18-3#

V: We discussed a number of elements of the business model, do you feel any element is missing? #00:38:05-1#

M: as I said you were challenging me to think in ways that I haven’t thought before so I am still recovering from thinking about those questions. #00:38:19-8#

V: We already talked a lot about \*company\* and you already told me about immediate next steps towards circularity, what do you think should be the next steps to achieve a holistically circular economy? #00:38:50-3#

M: I love to think that we are thinking holistically. I think there is an increasing awareness by companies, including \*company\*, that we need to look at global issues not just issues associated with our products and their production so as we develop our 20, 30 goals - and we are in the process of doing that - we are looking at the UN Sustainable Development goals and trying to see how we can make our goals align with those. We are looking at for example inclusivity, the bias between men’s and women’s salaries, salaries of majority and minority populations and how we can not only correct those within our own company but also within our supply chain and then move from our supply chain to see these principles enacted broadly in commerce. I mean there are so many to look at. We are struggling with the issue of what is called democratisation of our products. How do we bring our products to the bottom of the economic pyramid because we don’t want to be a company that only sells its products to the upper income bracket of developed countries. We want to see our products made for the benefit of all people. We’ve got a lot of work to do. #00:40:50-3#

V: How can circular business models lead to sustainable consumption? #00:41:48-6#

M: I think if you have a circular business model then almost by definition you have sustainable consumption. Because at some point there will be a limiting factor in that circularity that lead in a market place model lead to higher prices and therefore reduces demand or some other consumption limiting effect. #00:42:24-5#

V: What do you think will be the key differences in the way business will be done from a user/consumer perspective? #00:42:42-0#

M: That he has an obligation to manage his product materials after he/she is done using them. The waste can will be no longer an option but he will have to thoughtfully place something in the bin for recovery. I think that will be the major one and if we are successful they will have showers, they will have hot water for washing their clothes and they will have automobiles that can drive them several hundred miles at a comfortable speed. #00:43:39-9#