Transcript Q&A

The Circular Economy: Redesigning the Future

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Bernice Lee:
Thank you very much, Dame Ellen, for the inspiring talk. I’m going to kick off with a quick question actually. How far can we go with this?

Ellen MacArthur:
I guess ultimately we have to go all the way. If we have a growing global economy, if we have more and more pressure on these resources, then the goal would be to cycle as much as possible. I’m not a physicist and I’m not an economist, and I know that you have entropy and you can’t cycle everything to its absolute tightest circle. But we have so far to go from where we are now. We are cycling so little of the material that the opportunity is so large.

Bernice Lee:
It’s also about changing really the way we think about consumption, one from basically buying and selling to one that is about leasing. That’s actually quite a fundamental change in the way we approach material objects and others. So I think in fact a lot of the implications of what that would mean will play out as this idea catches on further afield in different parts of the world.

The other thing that I thought was very interesting – and I also heard Stef speak, from Desso – when he started looking at recycling and reusing and leasing the carpet tiles, he realized he’s got to take the toxicity out of the production process. So he ended up actually cleaning up a bit of production, not just reusing material, which is all the core benefits again that we are only just beginning to see.

I’d like to open this up to the floor.

Question 1:
My question is mainly about energy systems. You mentioned your grandfather, who was a miner. We now need to mine the sun really, and the wind. Can you talk about that a little bit? Because it’s very much part of the story, isn’t it? Without this massive energy input coming out of coal, coming out of oil and gas, we wouldn’t be where we are today – including the production and the urban systems under which we live. So what do you see as our regenerative energy future?
Ellen MacArthur:

One of the principles of a circular economy is we move towards using renewables as our primary energy source. But one thing that I’ve learned along the way – and I’m not an energy expert, I never will be, I’m someone who’s trying to put together a foundation to try and help to drive change. But from what I’ve learned, when you go – and actually tomorrow I’m going to be just outside Paris, I’m going to be at a remanufacturing plant which is run by Renault. It’s a plant where they take engines, gearboxes and fuel pumps from across their network. They remanufacture those engines, gearboxes and fuel pumps – they take them apart, they recover as many parts as they can. They then get tested to the same level as a new engine and then they get reassembled into engines. When one of those engines leaves that plant, it only has 25 per cent of the energy in it compared to a new engine. So you’ve immediately, through remanufacturing that engine, reduced your energy demand by 75 per cent.

Now, you can’t do that with everything. This is just one example. But this is with current technology. So I think we don’t have all the energy answers. It’s going to be a massive demand to shift towards renewables. If you’re trying to replace what we use currently today with renewables, I think that would be extremely difficult. But if we can change the system, and I don’t have all the answers, to represent the shift that’s happened within the Choisy plant with their engine remanufacturing – if you can shift that throughout manufacturing, if you could remanufacture the printers and photocopiers as they do, if you could remanufacture the tyres as they do over in the [United] States, then actually you start to reduce the level of energy that you need through manufacturing. In other areas I’m sure it will increase, but you’re shifting the system. I think it’s the systems-level change that’s the most important. When I began trying to learn about this, it was a real challenge to try to work out how you could swap renewables for the energy that we have today. It seemed almost impossible. We don’t have the answers but we can see a shift in that primary demand.

Question 2:

As a person who’s fiddled about in yachts for 40 years, I would like to say how much I admire your achievements, Dame Ellen. Also I’ve run a construction company, which leads on to my question. My experiences from that and quite a bit of industry is that it’s cheaper to buy new – for instance, building up a greenfield site is cheaper than building up a brownfield site. I therefore admire the principles but the actual hard facts are money – the
bottom line is profit and firms are driven by that. They have to be because unless they make a profit, they go bust. How can you, shall we say, sustain your ideals in the meantime before the utopian world comes about in which we all adopt the principles that you expound? I mention here that Renault, one of your supporters, are in fact in financial difficulties.

**Ellen MacArthur:**

Absolutely. I think there’s a lot of the European economy that’s having some quite big financial challenges at the moment. One of the issues within the car manufacturing business is that in the run-up to January last year, €500 million of their operating profits were wiped out by raw material price increases. The companies we speak to are being hit by the fact that there are higher prices for the steel for buildings or the indium for phone screens or their IT equipment. Those prices are going up and becoming more volatile. The volatility is almost a bigger problem because you can’t predict it.

So I’d say industry is asking questions about how their model can run in the long term. I’ve sat in front of CEOs who are asking those very questions. One of the main reasons we went to McKinsey six months after creating the foundation was to find out the numbers. We felt the circular economy made sense as a basic model, but did it work for the economy? Was it good for business? Did it provide increased growth for business? Did it provide employment for the wider EU economy? Could it create growth? The answer to that was yes in every single case that we looked at. So this isn’t driven by companies saying: we need to change the way we do things; we’re concerned about the way we do things. It’s: we need growth right now; we need growth to lift ourselves out of this financial crisis. Where can we find that? And I think one of the things that’s being looked at is a circular economy, from our conversations with business, because you’re decoupling growth from resource constraints.

If you took the example of two companies – because we’re talking about cars, two European car manufacturers. If you say that you have Company A, who remains entirely linear, who makes all their vehicles taking new raw materials every year, and is tied to the volatility and the price increase of the raw materials which we are seeing across Europe. They continue to invest in that model. They try to make their cars more efficiently and use less energy but they continue to invest in that model. Then you have Company B that says: we’re going to aim towards becoming more circular. It’s going to take years and we’re zero per cent of the way today but we’re going to work towards
becoming more circular. If they could say, for example, that they've got 30 per cent of the way – that 30 per cent of the materials come into their vehicles come from vehicles that they've already produced before, or if you say they have a different offering, for example to their customers, so you could buy a remanufactured vehicle or you could pay for road miles – as we're seeing happening more and more – then which of those companies in the future will be more investible: Company A, which is tied to resource constraints, or Company B, which becomes more circular?

The debate we’re often having among the business world is: this is investible. This is something which is more investible, because the more circular you are, the more resilient you are to the global economy price hikes and the raw material price increases. I think that’s something that’s very much driving this. But we have huge vested interest in business as usual, I don’t disagree. But I think people are really beginning to look at different models as to how can we decouple growth from our resource constraints.

**Bernice Lee:**

I was just thinking, living in an 18th-century Victorian house, I wish that I’m leasing my walls rather than having to fill the holes every year that refuse to be filled.

**Question 3:**

I’m interested in what you think governments, who have grown up their regulations, their whole structures around a very different, totally disposable economy, with very cheap resources in many ways – a sort of buy-and-chuck sort of mentality – what can governments do to take away the barriers or incentivize a much more sustainable and long-term approach to the economy?

**Ellen MacArthur:**

As I mentioned in the presentation, we’ve been working with the EU now since last summer and these are exactly the questions that we’ve been raising among the Resource Efficiency Platform, which is made up of businesses, commissioners and European Union members. Also it’s made up of NGOs, such as the foundation and others. So we’ve been asking these questions. We have as the top line, ‘let’s try and accelerate the transition
Towards a circular economy – but how do we actually do that? Taxation is something that’s discussed at length, but I think it’s important to point out that in that report there was the transition scenario and the advance scenario. The transition scenario of 340–380 billion does not require any change in government legislation for that to happen. I think that’s the first point. So this is happening and can happen without government legislation.

Other things that we’ve been looking at is the taxing of resources – when you look at resources at the moment, taxing non-renewable and renewable resources. One of the experts we’ve been working with around the circular economy is someone called Walter Stahel, who wrote a book on this subject of the ‘performance economy’ I think the year I was born. He’s incredible; he’s done many years of work on this. Some of the work he’s been doing is: is labour a renewable resource? Ultimately, yes. So would you shift the taxation from labour, assuming that’s a renewable resource, onto non-renewable resources?

It’s early days, there’s a lot of work being done, but it’s about ultimately how can we shift that. Is it increasing producer responsibility? So the manufacturers having more responsibility for the products that they make. Ultimately when you get to a circular economy, they go back to those producers in many cases, or they work with third parties to cycle those materials. How can we encourage that to happen? We believe it’s driven by economics, but how can we further accelerate that? That’s the question.

Bernice Lee:

How many of the companies that you’re working with are already making money from adopting a circular economy model?

Ellen MacArthur:

Since we kicked off the foundation in September 2010, between our founding partner companies we’ve targeted projects up to $1 billion. Just among those five companies. So that’s looking at net material cost savings but it’s also looking at new business revenues – so how can they shift the business model to allow the products to come back and ultimately to then make the most of the fact that they’ve been redesigned?

But when you look at the stats for companies like Desso, Michelin, Ricoh – the profits that you make on remanufactured products are greater than new ones. If you take the stats around the remanufactured vehicle – and this isn’t
happening now, it’s the engines that are remanufactured – if you take a vehicle that’s done 100,000 miles and the manufacturer of that buys it back at the market rate, they could then remanufacture that vehicle. They could change the engine, the drivetrain, the gearbox, they could respray it, they could reupholster it. They would then be able to sell that car looking like a new car, with the same warranty as a new car, but at half the cost of a new car – and make three times the profit they do on a new car.

We don’t have all the numbers from all the companies doing this, because a lot of that is their own IP (intellectual property). However, what is interesting is that when we ran the numbers with McKinsey, you could actually see that there was a lot of money to be made through this different model. It’s a different offering, it’s a different design paradigm, but it’s driven by both sides having a better deal – like the washing machine. You actually get a better machine for less money, and the manufacturer can make more money.

Bernice Lee:

I think the other interesting thing is that producers shouldn’t worry that that means that they will not be used again. I mean, if you’re an aluminium producer – another interesting thing about the circular economy is that you need a certain amount to incentivize the reuse. Therefore you can’t just reduce it infinitely. So in some sense it’s almost a guarantor of a longer-term use, which is quite counterintuitive the more you think about how the new system would work compared to the one we have.

Question 4:

The presentation is very convincing but you seem to have talked mostly about metals and so forth. I hope I don’t upset people in this room but potentially we are all part of this circular economy. Have you thought about how that could be developed?

Ellen MacArthur:

Crikey, I’ve never been asked about that before. One thing that we did with our previous study was look at the energy that could be recaptured from human waste – which isn’t really currently the case, from a fertilizer perspective as well as an energy perspective, farm waste – that’s done in many cases, and food waste. The second report we produced showed that within the UK there is 1.5 billion value being lost from food waste compared to
if it was anaerobically digested – the gas were recovered and the fertilizer went back to farms. Actually what was interesting, and I’m not suggesting we should all go through anaerobic digesters, but 10–11 years ago there were two anaerobic digesters in the UK; there are now over 200. So the speed of increase in this technology is happening and I think we’re looking at inputs into those anaerobic digesters, but also where can those inputs come from. Would packaging that comes from a supermarket be designed to go in an anaerobic digester? It’s not today – it’s designed, some of it, to be cycled, some of it not. Each of us goes through it every day with our bins – ‘this film is not currently recyclable’ – whereas products do exist that are. So what if you change that whole system? That may include us as well, ultimately.

**Bernice Lee:**
I do find that a little terrifying, I must say.

**Question 5:**
You presented an extremely compelling vision of the future. In a lot of what you said, it sounded like it should almost happen by itself but without any need for interventions. You did mention, in response to one of the earlier questions, vested interests. I was wondering, could you talk a little bit more about the barriers that are blocking us from moving to a circular economy and what kinds of barriers are they. Are they economic interests? Are they cultural factors? Are they institutional? What are the barriers that we need to overcome to get to the circular economy you’re talking about?

**Ellen MacArthur:**
I’d say one of the first barriers that we see within the business world is being aware of another way of doing things, quite frankly. From the work that we’ve done with many companies over the last two and a half years, people run a linear system. When you look at the incentives within business, you’re incentivized as a salesperson to sell stuff and it’s units, units going through. The whole system is set up to drive that linear system faster and faster, to be more and more efficient – which ultimately often means there are fewer jobs, because the factory becomes more and more efficient. I think we’re locked into that system. I think one of the biggest barriers is actually seeing there’s a different way of doing things. When you get the board of a company or the management of the company sitting down and talking about, how could we do
this differently? Then running the numbers – then things start to get very interesting. The conversation gets interesting. Then it’s the next stage of how do we actually put this into practice within our company. I think we find one of the biggest drivers is obviously economics, because the papers that we put together with the help of McKinsey have shown that actually there’s a real economic driver to doing this.

I would say some of the barriers have been technology – 100 years ago we probably couldn’t have done this, we didn’t have the same RFID (radio-frequency identification) tagging, we weren’t able to trace the materials. Now that’s becoming much easier with people having smartphones and being able to trace. There’s a whole technology space that’s expanded.

I’d say that from a business perspective, there is the lock-in. There are conversations like with the mining companies, for example – is that a barrier? I was talking to a guy who was involved in mining and steel production at the World Economic Forum, who initially was actually sitting up in his seat thinking: does this mean we won’t be mining? Ultimately we will continue to mine because we’ve got 3 billion new middle-class consumers coming online and we’re only a tiny way along the journey to a circular economy. But his mind suddenly thought: there’s a massive opportunity in reprocessing. So if these companies are changing their systems – and from the case studies that we see, there are many companies working with the individual company that makes the product. So there could be 10 different players in the scheme of recovering materials, who make the tyres, who make the fabric – there tend to be multiple players. But if you change that whole system so that those materials can flow and you involve all of these different players, then actually maybe the steel manufacturers who have the processing facility can reprocess and then become part of this.

So I think what we find are very positive conversations as to how we can take this forward. Again, without all the answers, but a lot of it tends to be incentives; taxation can definitely play a part in accelerating this. But it’s often that first conversation. Like the design student – actually everything needs redesigning, it’s that shift. It’s not easy, but there are many companies out there doing this.

**Question 6:**
I’m an investor in recycling companies, including Valpak in the UK and Der Grüne Punkt in Germany. We operate mostly in Europe and it’s a good environment for recycling and circular economy. We’re looking for
opportunities around the world but it moves slowly. How do you see the opportunities and the state of progress in the developing world versus the developed world?

**Ellen MacArthur:**
I think from what we’ve seen there are pockets of activity going on around the world. The biggest by far are within Europe. When it comes to the cycling of materials, actually a lot of the developing countries do that really well – very manually but really well. But they’re cycling a product that’s not designed to fit within that system.

We have been talking to companies from the developed world very interested in this. I think there’s a massive opportunity for the developed world. Are they streets ahead of where we are within the design and the different business model? No. There are many companies we’ve spoken to within Europe – to come back to Europe – who actually don’t see themselves as waste recyclers anymore, they ‘manage material flows’. That’s how they see themselves, as being one element that fits into that cycle.

I think one of the challenges with the circular economy – it’s almost a similar answer to the barriers question – is this is a systems-level change. When Stef started cycling his carpets, he talked to I think five different yarn manufacturers. He said, ‘This is what I’m going to do; my plan is to send you back my old yarn.’ Two of them said, ‘Not really interested.’ Two of them said, ‘Yeah, we’ll have a go at that.’ One wasn’t sure and was on the fence. Yet I think he said within five years they were all doing it. That is a barrier, having that conversation with the suppliers, because it’s not just you who gets involved in this process, it’s also the other parties. But I think there’s a massive opportunity for the developed world, but I don’t have all the answers at the moment.

**Bernice Lee:**
I think China already has it in the five-year plan, which is not as much about the business model side but much more about reusing and waste management. So there are great opportunities there.
Ellen MacArthur:
And for example within China there are some phenomenal examples within their industrial parks of industrial symbiosis. The waste of one manufacturing process can go and feed into another.

Bernice Lee:
I've got a sort of unfair question for you. Another trend that is going on at the moment in the world is that of 3D printing, sort of distributive manufacturing. In a way your model does not necessarily go distributive, as far as I can see. I just wonder how you think the two trends will play out in the manufacturing game, because I find that to be one of the hardest questions that I've been asking myself.

Ellen MacArthur:
We were actually visiting the States just before Christmas and we went to MIT in Boston. We went to their media lab and they've been doing a lot of work on 3D printing. Seeing some of those products were absolutely incredible, but what struck me from a circular economy perspective – and it's kind of one angle to the question – was that when you 3D print, most of those 3D printed products are made out of the same material. From a circular economy perspective, that's fantastic, because you have one material that can go back into a cycle, be depolymerized, whatever that might be. What if you 3D print out of a biological compostable material, at a certain temperature? So I think there's a huge opportunity there, because ultimately there is a product that goes into the 3D printer to create the actual product itself, so could the object itself ultimately through reprocessing go back in to become something else?

Bernice Lee:
That sounds like a great place to start engaging with the innovators of these materials, to make sure that indeed they could be reused and recycled.

I'm going to volunteer Jeremy Oppenheim [director, Sustainability and Resource Productivity, McKinsey & Company], actually. The last time I saw him was when we were both escaping from the blizzard in New York and I saw him walking towards economy [class]. I don't know whether you would understand how shocking that is. So Jeremy, I presume you would have a lot to add with the McKinsey study as well on this circular economy idea.
Jeremy Oppenheim:

Bernice, thank you. I managed economy class coming back from New York perfectly, so there are all sorts of lessons in that for the future. I was hoping for that glass of champagne to be passed back but not so.

First of all, there’s very little I can add to what Ellen has said because the content of the material has not only been brilliantly described but given life, and I think that’s the real challenge that we face. I think the concepts in some ways are getting ever sharper and their applications are becoming ever more pervasive. The real challenge for this is a classic S-curve challenge in any economic system. At the moment there’s probably, if one could really measure it, five or 10 per cent of the global economy that is already in some respects meeting dimensions of what we might call the circular economy. When you start looking for it, it’s like – I’m told by my wife that when she became pregnant she discovered that everybody else was pregnant, there was this Mothercare phenomenon. And as you start really looking for the circular economy, you begin to see it in pockets everywhere.

But the challenge that we face is really taking it to scale. I would say there are two things that are going to be really difficult. These are kind of the headwinds, but there are also tremendously strong tailwinds. I think one of the tailwinds that is going to be really powerful is the way in which the consumer behaviour is changing. I think there is a pattern emerging in terms of what the next generation – not just in Europe, but in China, in many countries – can create for themselves. There is a huge shift and an unleashing of consumer power, not least through IT and the internet, that can enable this trend in a very deep way.

The deepest challenge is, one, in the sense of the investor community and the relationships they have with a particular conception of business models and how business models make money. If you look at the way in which the analysts still do their modelling – spreadsheet after spreadsheet, it’s this volume – it’s a linear model of understanding how companies make money. That then feeds its way through the board and through to management and it locks them into a sort of behaviour. So I think there’s an education of the investment community that needs to happen, deeply and fast. I know we’re working on it.

The other thing, which is at the level of the physical world, is about reverse logistics. Getting the reverse logistics so that we can recapture the material flow in a really efficient way and in a sense deal with the challenge that you described right at the beginning. A lot of the relative economics hinge on the
efficiency of the reverse logistics systems. I think that’s where we absolutely need to get the system dynamic up and running, and that is the thing that will take the S-curve up the steepest part.

Bernice Lee:
Thank you, Jeremy. Ellen, would you like to respond and wrap?

Ellen MacArthur:
Thanks, Jeremy. I think there are many hurdles towards moving towards a circular economy, but I think the one thing that we at the foundation – and now there are 27 of us working on this, which seems extraordinary, to think we were only here two and a half years ago – but we find it really motivating to have conversations with businesses because this is around something extremely positive that unlocks potential. I think to see repeatedly with the groups of people that we work with – and this could be A-level students or it could be people studying with a university, or it could be the CEO of Cisco that we were speaking to recently – when you see this played out within people’s thought processes and people’s minds, they get it. They see the opportunity. I think when you see that and you can see people moving toward that and understanding that – that for us is something which is hugely positive.

We have absolutely not done this on our own. There have been huge numbers of people – like McKinsey, like our partners, many of whom are here in the room tonight – who have really made a difference. If these guys didn’t back us when we kicked off two and a half years ago, when no one had even heard what a circular economy was, we wouldn’t be sitting here. Actually it’s been the belief, the drive, the energy and enthusiasm of many people that’s made this happen, but we’ve only done that much.

Bernice Lee:
I’m happy to say, from what I could hear, a lot of us are definitely with you on this. As Jeremy said, once you get the idea in your head, you see it everywhere. I was watching Sex and the City on that plane in fact and it turns out there was an episode that talks about leasing handbags. So actually it’s much more common than we think – it’s not just the Boris bikes. Indeed I find that to be quite an easy way to explain to people what that really means, for ladies especially. In any case, please join me in thanking Dame Ellen.