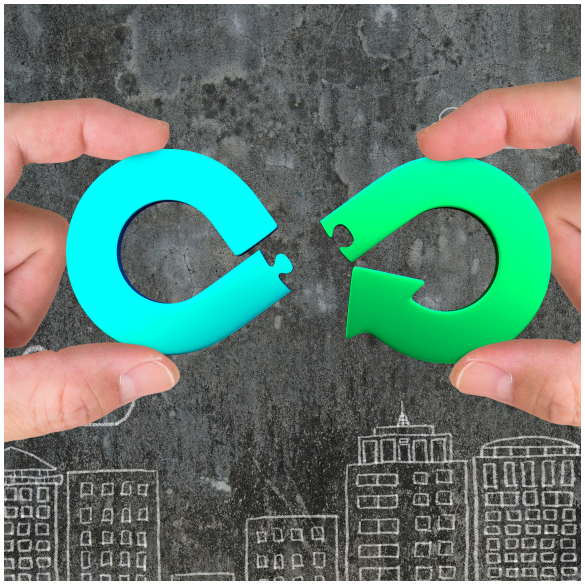
Can a Circular Economy Salvage the Climate?

https://www.climateone.org/audio/can-circular-economy-salvage-climate
Recorded on June 21, 2019



Greg Dalton: This is Climate One, changing the conversation about energy, the economy, and the environment.
Produce, consume, discard – we all know the routine. And maybe we think recycling that paper coffee cup or plastic water bottle is the best we can do for the planet.

John Lanier: Recycling is not the answer or the solution to advancing the circular economy. It's an answer, but actually one of the weakest ones.

Greg Dalton: Innovative companies are "going circular" by transforming how their products are designed, used, and remade. Some are even rethinking their sources - finding that there's more than one way to put the "cycle" in recycle.

Beth Rattner: Pulling carbon out of the air, taking it from source emitters, pulling methane off of farms and creating new kinds of stuff, new kinds of plastic…that's the recycling story we should be telling.

Greg Dalton: Can a circular economy salvage the climate? Up next on Climate One.

Greg Dalton: Reduced waste AND increased profits – can they go hand in hand?
Climate One conversations feature oil companies and environmentalists, Republicans and Democrats, the exciting and the scary aspects of the climate challenge. I'm Greg Dalton.
If you want to understand the concept of a circular economy, the best examples can be found in nature.

Beth Rattner: Imagine if everything we made was functionally indistinguishable from nature. That's the goal because when you walk into a forest that whole forest is working toward a

single common good which is the protection of the forest; that is its survival strategy.

Greg Dalton: Beth Rattner is executive director of the Biomimicry Institute. She explains that nature has already come up with the most efficient system for optimizing resources – all we have to do is follow her lead. In a so-called "circular" economy, corporations strive to eliminate waste in manufacturing by reducing products to their simplest, purest form, and by designing them to be reused, rather than thrown away.

Good for the climate, good for the planet – but is it good for the economy? Or could compelling companies to alter their practices threaten the societal benefits they do provide?

John Lanier: Can we ask our economic system to do that, to continue doing that, to not stop improving quality of life around the world, while it also shifts in such a way that it solves our environmental challenges?

Greg Dalton: John Lanier is director of the Ray C. Anderson Foundation, named for his grandfather, a captain of industry who became a pioneer in corporate environmental sustainability. My other guests today are Beth Rattner of Biomimicry and Peter Templeton, President and CEO of Cradle to Cradle Products Innovation Institute.

Lanier starts off by telling us his grandfather's story.

John Lanier: Ray Anderson for most of his professional life up to his 60th year on planet Earth was your typical businessman just trying to make high-quality products and make a buck. And he did that very well growing Interface into the world's largest carpet tile manufacturing company doing about $1 billion a year in sales in 1994. But that was the year when people began asking Interface a question. One of those people is in the room here today, John Picard, what is Interface doing for the environment. That question, then made Ray open to reading a book. And the book was The Ecology of Commerce written by Paul Hawken that charged business and industry as the sector responsible for the greatest amount of environmental degradation, but the only sector large enough well enough organized and capitalized to fundamentally solve the environmental challenges that we have.

Reading that book was an emotional experience for Ray. That was what he called his spear in the chest moment. When he realized he was this plunderer of the earth, and from that day forward, he was committed to making his business, Interface, a publicly traded industrial manufacturer, as environmentally sustainable as possible so that he wouldn't have to be that plunderer, that legal thief that he referred to himself as.

Greg Dalton: And something very early on and he wrote the book the Mid-course Correction after that spear in the chest moment. And he wrote early in that book about crying openly when he learned about clearing of the Amazon to raise soybeans to feed to cows in Germany to create butter and cheese that would then pile up there in Germany while people in Rio in

the favelas of Rio were starving next to where those soybeans were grown. Not many CEOs talk about crying in the first chapter of their business book.

John Lanier: He did. He was a remarkable individual. He could talk about the bottom line and the price-to-earnings ratio of the company and everything that Wall Street wanted to hear. But when it came down to it, he was motivated in this quest up mount sustainability with the people of Interface out of a deep sense of love. And that love was for the people of Interface, that love was for all of the people he spoke to and the hundreds of speeches he would give year in the mid-2000s, and importantly that love was for the generations of people who have yet to walk planet Earth. Because he understood what was at stake for real people when it comes to environmental work. It was easy for him to talk about what he found just fundamentally tragic and that moved him to such sorrow.

Greg Dalton: One day senior executives of a major food company visited Interface to learn about their sustainability practices. Here's Ray Anderson retelling an encounter with one member of the visiting team.

[Start Playback]

Ray Anderson: One woman in the group and she was head of global engineering. This woman did not want to be there. She did not understand why they would come to a carpet mill in Georgia, of all places of all things to learn about sustainability. What could they possibly learn from us. She's obstructive and challenging everything. Then the midmorning break comes and to get to the ladies room she has to actually go through the factory on her way to the ladies' room at the back she encounters James Wisner, fork truck driver on the factory floor with this big roll of carpet on his fork truck. And she stopped and she says, what are you doing here? In that tone of voice. And James, bless his heart, says, ma'am I come to work every day to help save the earth. And she was just stunned by that. So she started drawing him out, you know, what do you mean, and finally after a couple of minutes and he says, ma'am, I don't wanna be rude, but if I don't get this roll of carpet to that machine in the next minute our wasted emissions are going out of control, I got to go.

She came back to that meeting, a visibly different person. She sat there very quietly in total contrast, the way she had been before. And then after a while she started challenging her people, why aren't we doing this why aren't we doing that. And then she told the story of her encounter on the factory floor. And she said, I've never seen anything like it. That demonstrate the alignment in the company from the very top of an organization to the factory floor. She says the only one word I can think of that describes it and it is love. Love on the factory floor.

[End Playback]

Greg Dalton: That's Interface founder and former CEO, Ray Anderson in aNatural Step online video. Beth Rattner, just your reaction seeing and hearing that?

Beth Rattner: Oh it’s so beautiful. Before I was Biomimicry Institute executive director I was a management consultant, sustainability management consultant and that is the dream story right there. That's what you want when you work with the C-suite and you come in with a strategy plan, all you hope for is that it can trickle down at that kind of a level. So and it’s true that’s the most infusive way that you’ll ever gonna keep your company going because management changes.

Greg Dalton: Peter Templeton, tell us, you know, we hear circular economy, what is that? Some people maybe have trouble defining it. Help us understand what is the circular economy?

Peter Templeton: The circular economy challenges us to look beyond the traditional take, make, waste perch of the linear economy that exist today to overcome some of the challenges that Ray has talked about facing us as a society by looking at where the opportunities exist for us to recover those materials to retain their value and repurpose and regenerate them into new products that can continuing perpetual cycles of use.

We’re looking to up cycle to find greater value in this products and materials through each use.

Greg Dalton: Beth Rattner, lot of people probably thinking about recycling, you know, okay, but there’s a bit of a recycling problem right now. Now that China has stopped accepting, you know, China doesn't want to be the dumping ground they want to be, first they’ve been in the factory floor they want to kind of move up the value chain. So what is that doing to recycling because it’s kind of got a black eye these days.

Beth Rattner: It’s a really important question. And I'm gonna pivot a little bit on it only because there’s -- so before I was at -- after the management consulting and before Biomimicry, I was with Cradle to Cradle for a number of years. And there's this fundamental recognition that we are making things out of the wrong other things, right. If you look at how nature makes everything us included, it's mostly carbon, it’s hydrogen, it’s oxygen, it’s nitrogen. That's the most abundant, you know, of elements that exist. At the very, very bottom of that would be the trace elements the aluminums, right. So we can talk really frankly proudly about our aluminum recycling but the truth is we should be looking at the more abundant set of elements. And that is when we start talking about pulling carbon out of the air taking it from source emitters pulling methane off of farms and creating new kinds of stuff new kinds of plastic the way that New Light Technologies is doing with air carbon or Blue Planet is doing with concrete. That's the recycling story we should be telling.

Greg Dalton: So we should start to back up and start using what are we making stuff out of. Making out of the abundant things, not the scarce things and that would sound like that would be cheaper if you’re using something that’s abundant rather scarce, right.

Beth Rattner: It solves a couple problems, yeah, it solves a couple problems. Go ahead John.

Greg Dalton: John Lanier.

John Lanier: I want to highlight something about the concept of recycling. It is considered this remarkable green practice and it is. We should celebrate how far we've come in that space and mourn the fact that we've lost the ability to recycle plastics in China. But when you think about the circular economy, recycling is not the answer or the solution to advancing the circular economy. It's an answer, but actually one of the weakest ones. And I would point to the work of the Ellen MacArthur Foundation some of their thought leadership in this space and the graphic that they use to depict all of the ways in which a circular economy would work. They show multiple loops. They're not the only ones who have shown this. Ray wrote his book originally and had similar graphics. But the number of loops are important because the tighter ones things like reusing an item that's a circular economy practice that keeps things at the highest value.

Greg Dalton: The cycle is actually at the end. Reduce, reuse, recycle.

John Lanier: It's the last one it's what we should do as a last result before we throw something in a landfill. So we have to be championing the more impactful circular economy solutions.

Greg Dalton: And so Peter Templeton, what are companies doing to sort of step up and use better materials from the beginning that maybe don't need to be recycled. So take us back further upstream.

Peter Templeton: Well, I want to add to this thread here and say that the starting point for us is always going to be safe materials. We want to be looking at safe and circular. So we are looking at the material health of those components to make sure that when we're perpetuating those materials not only are they good for the health of the people and our planet, but they also have the maximum options for use in the future because we know that they're not going to cause unintended harm or consequences. So that's the starting point for us.

And what is really beautiful is seeing so many organizations that are rising to that occasion seeing the opportunity that exists around this when they do take those steps to be able to continue to create value from their own products by reclaiming those products through cycles of use. And they have many different examples of that we see in products and services these days. When we look at just challenging our concepts of how things are delivered like lighting with Philips lighting Signify now moving into a model where they'll be able to provide lighting as a service to organizations. So they take on the responsibility for those materials through their lifecycle. They maintain those lightbulbs those fixtures and maintain a cycle through which they can reuse those and repurpose them beyond their immediate use. But the client benefits from that from lower upfront costs and of course having the continued use of light throughout for its purpose.

Greg Dalton: So, lighting as a service you don't buy your bulbs you rent them. Someone

comes to fix them they take them back. I think Interface tried that with the carpet early on didn't work so but they were ahead of the game.

John Lanier: They were. They call it the Evergreen lease and that was the hope, could Interface always own the carpet that they make and just lease it to people. Put it in their facilities and maintain it, clean it, take it back at the end of its useful life and repurpose it then recycle it into new carpet, keeping it in a closed loop manufacturing system. There are challenges candidly and Interface isn't able to utilize the Evergreen lease, at least not now, I think they'd jump at the chance to start it back up. But some of those challenges are how do you do the accounting for something like this. What are the depreciation schedules on a leased product compared to an owned product. And will the customer be willing to acquire the carpet from their operating budget for something that's leased when they been used to using their capital budget to buy something and acquire it. If they're not willing to make that shift, then they're not even gonna be open to it. Created challenges that weren't all able to be solved. It just shows we have more work to do.

Greg Dalton: Peter Templeton.

Peter Templeton: Just to add on that while that particular approach wasn't successful in its initial run, the carpet industry as a whole has stepped up and taken notice. And I think that that's what's important is that we are seeing these leadership moves are inspiring others to look at where the solutions exist. And so the carpet industry has actually come together in many ways to look at how they can reclaim those products and continue to use those materials to create new carpet fiber and new carpet backing and other materials collectively through reclaiming those materials across the board. And working together in a way that's actually I think inspiring for many other sectors.

Greg Dalton: So let's get real specific about materials. Beth Rattner, walk us through a potato chip bag and all the materials used in there.

Beth Rattner: Well, I have to credit Janine Benyus.

Janine has this beautiful quote which is, imagine if everything we made was functionally indistinguishable from nature. That's the goal because when you walk into a forest that whole forest is working toward a single common good which is the protection of the forest that its survival strategy. It's not going to take you out in the hopes that I'm gonna win only to find out that I'm gonna need you later, right.

And so the same is true for the potato chip bag. We've got into this place where we have to have where we use a lot of different chemistry all because want to sell this particular bag of potato chips for this single use. Whereas, and it's gonna have one layer for protecting the oil, another for keeping air out, another one for the packaging you know, the bright colors that you pick it off the shelf to begin with. But that's not how nature designs. It uses a very small, limited palette, but it uses structure to create very different functions.

So once you have these different structures in place. Now this and you can achieve amazing new capabilities. You can have bumps that shed water. You can have ridges that actually channel specific bacteria or repel that bacteria. We can do things with structural color. We don't have to use pigments and dyes. We don't have to make our rivers the colors that they are in Asia by dumping 450,000 gallons of wastewater in there every day because we want to look good. It's all about rethinking that pallet of materials and structure.

Greg Dalton: What's structural color?

Beth Rattner: What is structural color. By the way, we're gonna get out of my depths, I was a lawyer and not a biologist. You did claim that upfront, not a chemist either. Structural color though is fascinating it's this idea that so prismatic color is hitting every surface all the time and we, our eyes pick that up. It is canceling out every other color of the spectrum let's say except for blue, right. So now I'm wearing blue and the great thing about a structurally colored designed fabric, Tasin back 20 years ago a company out of Japan they created the first structural colored fabric. It was a little shiny though and just didn't get take off the way it was supposed to. So, unfortunately people stop buying that but there's a new group now that is looking to the blue tarantula for a very even blue color. Now all of a sudden we could have blue jeans that don't toxify the water supply. When water becomes what oil is, we're gonna wish we made our clothes really differently.

Greg Dalton: You're listening to a Climate One conversation about refashioning our economy to use up less of the planet's resources. Coming up, breaking the cycle of produce, package, purchase and trash.

John Lanier: So in this vision for the future we become owners of things…not consumers of them. That's a big and radical shift.

Greg Dalton: That's up next, when Climate One continues.

Greg Dalton: This is Climate One. I'm Greg Dalton, and we're talking about creating a circular economy to salvage the climate. My guests are Peter Templeton of Cradle to Cradle, John Lanier of the Ray C. Anderson Foundation, and Beth Rattner of the Biomimicry Institute.

We've been hearing a lot lately about the extinction crisis, as more and more species fight to survive in a changing climate. It's a disaster for so many reasons. But as Beth Rattner explains, it could also mean the loss of some unsung biological heroes.

Beth Rattner: There is so many reasons to have your heart broken over this topic. But I think from the egotistical we are capitalist we want to make more stuff perspective, we should be actually downright scared. There is a little organism called the springtail that is probably not

in danger of currently going extinct but if you saw it you would absolutely want to extinguish it. It's a little blue organism it's often found in marine environments and when you type in springtail into Google, you will see exterminator options coming up. This little guy holds the key to about a $23 billion market in fashion about a $54 billion market in auto and probably $110 billion market in semiconductors because it knows how to repel oils and water and everything else. It's very uncommon to be able to find oleophobic surfaces in nature, but it has this very specific sort of mushroom headed structure. And so when the oil or the water it doesn't actually, it's got tiny hairs in addition, but it also because of that mushroom structure it's not going to wet the core surface.

So if you're thinking about going to a concert and everyone's got their hands up in the air and they're passing that balloon around or the beach ball around, it's the same idea. That molecule of oil that molecule of water isn't wetting the surface. Now all of a sudden you have a massive water and oil repellent solution. So before we go extinguishing things before we go calling the exterminator or worse before our climate takes out some of our best teachers, we should be thinking ahead.

Greg Dalton: There's also another example that you talk about Beth, which is there's a professor at Stanford that's shaping wind farms using lessons from fish. A good example of biomimicry.

Beth Rattner: Yeah, vortices. Project Drawdown, which is a phenomenal resource talks about moving wind from 4% to 22% by 2050, right. It's gonna cost about $1.2 trillion to do that. That's a lot of capital. But what if we could actually do this in a biomimetic way. So the way that schools of fish work the very first fish is out there and he swims and little tail is going. And then the guy behind him doesn't have to swim quite so hard. So that vortices that are cast means that you have a much higher rate of efficiency of energy.

So John Dabiri out of Stanford took his vertical wind turbines and grouped them like the school of fish. He was able to get 5 to 10X the output of energy just because when that first wind turbine started to turn, so did the guy behind it. So we can spend $1.2 trillion and we should on new wind farms, but we can maybe spend less have fewer of them which has of course a land impact anyway all because we're looking to biomimetic models.

Peter, let's talk about some of the big drivers behind this. Walmart's done a lot on packaging are they still doing that, you know, they can do a lot of things at scale. If Walmart cracks the whip companies in the supply chain have to fall in line, is that still a big driver or they kind of plateau out all of the savings on packaging and other things they can get?

Peter Templeton: No, I don't think we're anywhere near plateauing on the savings it's possible and certainly the need for it. And I think this is cutting across again retailers and entire consumer markets at this point are looking where those opportunities exist both in terms of opportunities to optimize the products to consumers as well as the packaging associated with them. And then of course larger systems that deliver them. We're looking at

the suppliers themselves, distribution and the opportunities to reclaim some of those materials. And again, this is another area what we're seeing a lot of innovators that are stepping forward to be able to present different cases of their own success. We have, you know, folks obviously that you've talked to before, like Method where they brought together consumer products for their personal care items. Where they've looked at opportunities for them to reclaim plastics from beaches in Hawaii, bring them into their process for delivering better packaging for their products which are also healthier and safer products as well.

But we see that also being followed by other groups like L'Oreal and more mainstream groups that we're really excited to see them looking not only at how their products that have earned Cradle to Cradle certification but also the packaging behind them. And they're now engaging in broader initiatives around the packaging for those materials with Nestle Waters with Pepsi-Cola and others to look at how they actually reclaim those materials and make better packaging for their collective set of consumer products that they deliver.

Greg Dalton: Beth Rattner, where is that going in terms of plastic bottles if they're not gonna be up cycled they're not gonna be made into clothing. A lot of tension these days plastics in the ocean, we're just drowning in plastic bottles.

Beth Rattner: We are drowning in plastic bottles and more plastic than fish, right, by 2050 is the current number that's being talked about. I have so many different ways I wanna answer that question and I'm not sure which way to go. So part of me wants to say, look there are strategies -- the thing about how nature operates is number one is all spent on avoidance. We shouldn't have gotten ourselves into the problem to begin with and like the structural color example it's a really good way. Well, let's not think about how we're gonna clean up the rivers let's talk about how we're not gonna keep polluting the rivers to begin with. Then you've got to optimize the stuff you do have the water that you have the energy that you have and then there's the sequestration and the repair. So you're asking me a repair question. And really what we have to do is we have to actually emulate the different processes for how nature collects nutrients of all kind.

We have to think about this as we are all in this together. Employer responsibility for pollutants would be a phenomenal thing but right now we're all experiencing the impacts of it anyway. So why don't we design solutions where we can all help the problem. And so I feel like that's the biggest answer for Biomimicry out of the question the way that you're asking for me is how are we all gonna play a role in this cooperation. We all contributed to it, so what's the cooperation model that we should be following?

Greg Dalton: Yeah, well take your cup to Starbucks or walk around with your water bottle. But plastics get bashed a lot, but Beth Rattner, don't they also have some positive attributes in terms of how the molecules stay together over cycles?

Beth Rattner: Well, I can tell you the exciting for me about plastics is, I want to go back to air carbon for a second that new light. So this idea that we can actually be taking carbon and using a biocatalyst, right. So you're taking things that was about to become greenhouse

gases and we're capturing it into a reactor. Then we're using a biocatalyst, we, they, I'm not doing any of it. They use a biocatalyst and they separate out the carbon and then they re-polymerize it. Now you got a thermoplastic that is going to be biodegradable that is the future of plastic that we should be talking about. We should spend all of our time thinking about how carbon can be reused as a building block for our stuff.

Greg Dalton: And John Lanier, I think Interface may have a, what, carbon negative carpet. So the idea of carbon right now is kind of this waste product that's put out there for no charge. So talk about rethinking carbon as an input that's actually valued in industrial production.

John Lanier: Sure, yeah. Interface, and this was true to Ray Anderson's original vision, never just wanted to do no harm which is perhaps the best definition of sustainable that you can have. They always envisioned more becoming a regenerative enterprise. What would it look like for a company just because it operated just because it did what it did. What if that made the world more just, more environmentally safe? Could Interface help reverse global warming through its operations? Well, yes, they can transform their enterprise to do that and perhaps one of the most important ways that they can do so is to look at what they produce and ask the question. Can we sequester carbon in what we make? Can enough bio base material be added to Interface carpets where there's no loss on performance but the carpet actually has a negative carbon footprint. And the R&D team came back and said, yeah, we got your answer. The company is now working to commercialize that scale it and they've already made a commitment that all products sold today around the world has no carbon footprint because of offsets.

Greg Dalton: And you also think that this is a symbol of how capitalism needs to be kind of evolve and change where shareholders value this kind of thing. Because right now carbon is emitted for free, the air is a free sewer, John. So how does, you know, your vision for capitalism being revised reformed so that it is more sustainable?

John Lanier: Evolved. I would say it needs to evolve. Can we ask our global economic system to do multiple things at once. The very valid defense of our current economic system is that it has created more human well-being than any economic system that has been tried since the dawn of humanity. And that's true, it has.

Can we ask our economic system to do that to continue doing that to not stop improving quality of life around the world. While it also shifts in such a way that it solves our environmental challenges. That's what we should be asking capitalism neoliberal economics to evolve into. And one of the most important ways that that can happen is if individual actors within the system look for the opportunity to have a strong triple bottom line impact. I don't think there are any two issues that can be opportunities bigger than resource scarcity and the circular economy is the answer there, and global warming climate change. Those are the two big issues that are going to define what happens to our economic system when you look out over the next 80 years. When you look at the rest of the 21st century. Can we respond to these challenges and turn them into opportunities. Companies like Interface and there are others are working to do that.

Greg Dalton: Beth Rattner, you talked in one of your videos about humility and how confronting nature requires some humility. So tell us what you mean by that. When you look at humility, look at nature how it requires us to be humble.

Beth Rattner: There is so much chemistry that happens in nature. There is so much intense sophisticated design that again back to that springtail that you would want to squish or the scarab beetle, which is, have you ever seen the ones that are silver or gold or brightly colored green, almost metallic looking, you know, that's five microns thick, right.. It's super, super thin. And again the average person even my adorable nieces are scared of bugs they're scared of spiders. But we've been able to turn that around for them because we talk about all that they can accomplish. The tensile strength of the spiderweb itself like I said, the vibrant colors that are produced on the beetle from those tiny, tiny layers, by the way five microns is like 1/10 of your human hair. We're talking about a very thin layer that's able to just generate immensely gorgeous colors. How can you not be humbled by that how can you not look at how nature makes something so beautiful and so small and then what we do when we're trying to make color ourselves, or structures ourselves.

Greg Dalton: Peter Templeton, what's the world look like, Cradle to Cradle, what's the vision of, you know, what's manufacturing consumption look like and should we really address the underlying driver of consumption itself rather than trying just make better product.

Peter Templeton: Absolutely. They're both part of the equation. I mean in our philosophy, Cradle to Cradle, and circular economy we're looking to make sure that we're taking very pragmatic view. We are working towards or moving towards a planet of 10 billion people plus and we have to look at what is going to be required to support and sustain quality of life within the next 10 years or so. Our middle class is now going to double in size to over 5 billion people. So we want to make sure that we're not looking at the perspective of scarcity we're looking at a perspective of abundance. To the points that have been discussed here before, there is the opportunity for us to do more good, not just less bad.

And so if we do embrace these concepts which each of us have been talking about taking them and showing that they are real. These are innovations that can be put into practice and scaled then we do have the opportunity to grow and prosper in the space. And I do want this to be a very positive message. It doesn't all the negative focus on it because we do have the opportunity to reclaim those resources to maintain and continue to show their value in different ways through the creative approaches that we can all explore together.

John Lanier: Can I follow on that. I wanted to make sure that for people here and watching online that the concept of embodied energy was discussed because it's a part of this future, and the opportunity piece. There's some surprising solutions that we have at the intersection of circular economy and climate change. This chair, if you look at this chair what do you see? You probably see white leather and metal framing. I do too. I also see energy and water actually can have embodied water too. All of the energy that went into extracting the

materials or if this is real leather to feeding the cow that it came from. All of the energy to put it together all of the energy to ship it and eventually get it right here on this stage, that is locked inside of this thing. And if I took this chair and we went wrestling style and I smashed it on the ground, broke it. We'd have to go get a new chair. And we'd have to extract the material using energy to make the new chair and get it to the spot here.

So if we keep things in use their highest value as long as possible perhaps one of the greatest solutions in the circular economy space we preserve the energy. Therefore, the carbon where it is, we don't have to go and make that next thing and use more energy to do so. So this vision for the future we become owners of things. This is Patagonia's words and Yvon Chouinard's, owners of things, not consumers of them. That's a big and radical shift in this full system and something that I know resonates with the folks at Cradle to Cradle.

Greg Dalton: And there's so much pressure the company pressure though, John Lanier is quarterly growth and profits. Apple is in trouble because they're not selling enough iPhones. They want us to turn that iPhone in and maybe they'll recycle it and maybe you believe that but there's so much pressure to buy new things that that's, you know, so much overwhelming of individual virtue.

John Lanier: Absolutely. It's the problem of short-term thinking and we can't think that way. We're in big trouble if we continue to think that way. So how does it change? I think it changes, sure, you need shareholders to change the way that they think about return on investment. You also need consumers to change the way that they think about consuming or owning something. You need employees to demand more from the companies that they work for. We need so much leverage brought to bear on these fundamental flaws in our system short-term thinking being one of the biggest of them for those aspects of the system to move. And so it's really gonna have to come from a lot of places.

Greg Dalton: You're listening to a conversation about reshaping our economy from linear to circular. This is Climate One. Coming up, artists find some very creative uses for our trash.

Mike Sangiacomo: It started out mostly art sculpture, metal sculpture. A few people were doing things like making clothing out of materials that were thrown away. We've had some performance art.

Greg Dalton: That's up next, when Climate One continues.

Greg Dalton: This is Climate One. I'm Greg Dalton. We've been talking about how a circular economy could salvage the climate. But until we're living in a completely zero-waste world, what to do with the mountains of trash we do create?

My next guest, Mike Sangiacomo, is president and CEO of Recology. Here on the west coast,

Recology is responsible for turning leftovers into fertilizer, construction materials into groundcover and discarded household items into performance art – like the piece we're listening to. "Junkestra," by Nathaniel Stookey, is an orchestral work performed entirely on percussion materials salvaged from the dump.

For years, much of what we threw in our recycling bins ended up in China. But recently, China announced that when it comes to our garbage, they're no longer in the market.

Mike Sangiacomo: China changed everything for us in a very short period of time. They made very easy for us to be recyclers. People like us who collect material in blue bins sent most of it off to other people to process. And China was buying everything we had. When they cut us off we've had to scramble. We still have really good markets for cardboard for almost any other type of paper we have to make sure they're really clean. We have to make sure we remove contaminants from them. Bottles, cans, all those materials are all easily still sold to people who reprocess them.

The real difficulty has come in the three through seven plastics. Again that used to go to China we believe they sorted and reprocess them all. Other countries that are taking those materials now probably are not. We are looking for and they're finding some outlets for those materials. They have to be further sorted we can no longer just lump three through seven and send that to one entity for further processing they need to be separated. So it's adding cost it's much more difficult to find. We know where our material is going but I'm not sure where every else's.

Greg Dalton: Sure. And I've read some things that suggest this might be an opportunity for the U.S. to develop rather than rely on export markets to do this kind of work in the United States, you know, onshoring, reshoring. What are the prospects for handling that plastic ourselves in this country and then making them into the Cradle to Cradle principle would be making them into a product of higher value, not lesser value?

Mike Sangiacomo: We think that is the right approach and probably should've been the approach all along. But again it was too easy to go to China. Now that we can't we really believe that this country needs to accept that we need to do something with these materials we produce. Finding those companies that will buy those materials is there are more and more of them coming along. We actually challenge the plastics industry to rather just claim their material as recyclable to develop uses for these products finding us ways to recycle them, so they really can be put into use. California is actually looking at a variety of potential laws that would make it easier for companies who could use those products to open up in California and create facilities that would use locally recycled material in locally remanufactured products.

Greg Dalton: Zero waste is talked about a lot, is anyone achieving zero waste you know, and is that really an achievable goal or just kind of aspirational goal?

Mike Sangiacomo: It's hard, it keeps getting harder as the rule change as some places stop

buying what they used to. It's achievable, but it's going to take a lot of effort. We've been putting a lot of effort in trying to find people to take all the materials that we collect. There are things that some of the film plastics things like candy wrappers. We need manufacturers to make them in ways that they can be easily reused some products with multiple materials in them. There need to be ways to easily deconstruct those maybe some of those shouldn't even be allowed to be made depending on their overall impacts on the environment.

Greg Dalton: Years ago, I interviewed Dave Steiner who is then head of Waste Management. He said the Barbie doll was a nightmare all the different materials in the Barbie doll and trying to like separate them, and get you know, because lot of materials in there but there's many different materials and they are all very, very tightly bound, you know, iconic American product. So you would say to the product manufacturers think about the end-of-life.

Mike Sangiacomo: We actually do. We bring many manufacturers through our facility here in San Francisco every year to show them what happens to the products that they make. That they're not good recycling markets or that are not easily recyclable.

Greg Dalton: They change their design?

Mike Sangiacomo: Some have, I think most of them not yet. But I think as the American public becomes more and more concerned about what is happening with these materials. Sadly too many of them end up floating around in the oceans and all the issues that brings. Public opinion, public pressure is going to change. Kind of like what happened with the cigarette industry. Finally, people wised up and said, you're doing bad stuff to us we don't like it. The public stop buying and accepting but something like that will happen with the plastics industry. Get their attention and get them to make products that either are more easily recyclable or where they help us figure out how to reverse engineer those things, so they can be made use again to make another generation of products.

Greg Dalton: Been a lot of focus on straws these days it's something that's easily, you know, tangible everyone can relate to a straw there's many of them, in a day, perhaps for some people. Others say that that's just a trivial distraction in the overall big picture. Straws are just, you know, this obsession with straws is ridiculous, because, you know, it's not a big part of the problem. As someone who hauls away a lot of this stuff, what do you say about the straw phenomenon?

Mike Sangiacomo: Well nothing worse than seeing a picture of a turtle with a straw stuck in its nose and that's probably threatening its life, because it can't get it out. That attracts public interest, public attention and those are the kinds of things that are kind of actions, concerns get an industry hopefully change on their practices. Fish eating the stuff --

Greg Dalton: There's a whale, I saw a video of a whale that died full of 20 pounds of plastic in the stomach.

Mike Sangiacomo: Absolutely. Those things get public attention and start public outcry that we need to do something different. But when you see that there probably isn't a beach in the

world that doesn't have little flecks of plastic in it that's an issue.

Greg Dalton: Big part of the waste going into landfills, and a big part of the carbon problem is food waste. And in the waste industry they're called organics which is confusing for people who think of organic apples. Tell us about what's being done about food waste, because that's a top ten issue in terms of reducing carbon emissions.

Mike Sangiacomo: We started taking food waste, and composting it back in 1996. San Francisco was the first major city that offered composting services to every business and every resident in the city. So we have been taking that material for well, over 20 years now. We blend it with GreenWay yard waste and make a product that has a really high nutritional value for soils, frankly better for the soil than chemical fertilizers which do things like harden up water and nitrify soils. So yeah, we sell it, we get paid for taking it away which subsidizes the cost of manufacturing the product. We still don't have enough buy in on the product that people will --

Greg Dalton: Demand. Demand is not there.

Mike Sangiacomo: The demand is there but they haven't bought in that it's a more valuable product than the chemical fertilizers they used to buying. So that mindset is slowly changing, but San Franciscans actually put more material in compost bins today, than they do in the recycling bin. We're taking about 800 tons a day of organic material out composting it, putting it back on the soil as nutrients every day.

Greg Dalton: So that started in San Francisco I remember Gavin Newsom started that when he was mayor and there is jokes about him gonna go around and inspect people's compost bin to see if they were composting. So it was policy driven, why isn't there more composting around the United States.

Mike Sangiacomo: Well, what we have here is a really close partnership between the city of San Francisco and its waste hauler, Recology, who fully on believes in doing the right things for the environment who is that willing partner that will figure out what to do with those products. We actually do this in many other communities on the West Coast. We have eight compost facilities in California and Oregon now. It's spreading, California has enacted a law that by I think it's 2023 or so requires most organic material from commercial establishments to be recovered not put in the landfills. Today the most economical way to do that is composting but we are looking other parties have been playing with the idea of digesting those materials. You can recover gases from them it can be used for energy purposes. And the residual, what they call the digest state then used as compostable material. More and more that's happening but it started here in California, it's spreading. Little by little it'll find its way to the parts of the country. There's some going on in New England now as well.

Greg Dalton: Does it cost more for people for curbside pickup. The city have to invest in different kinds of trucks, you know, is there a capital cost to cities and to consumers here to get into composting?

Mike Sangiacomo: Yes. You need a separate bin for the material, it’s gonna be collected separately. So you're either running more trucks hopefully running them on clean-burning fuels so that’s not creating impact. There's an investment in a facility to do it but if you think about the long-term impacts of it, in my mind it’s cheap. You're not creating -- putting organic material in the landfill is the worst thing you can do creating greenhouse gases. In a landfill, those material break down mixed with other things that aren’t biodegradable.

Greg Dalton: Methane.

Mike Sangiacomo: And you get the release of methane, which is much worse than carbon dioxide in warming up the atmosphere. So that to me a really good reason for doing it even if it does cost a little bit more now. I think longer-term impacts are valuable.

Greg Dalton: Right. Especially if there's a price on carbon pollution the cities are paying attention to that.

Another really wasteful industry is construction waste. So much material is brought to construction sites and that a lot of it is hauled away. There’s some, you know, factory made prefab buildings these days still a little bit of a stigma for those. What's being done on construction waste which are some of the most wasteful areas of our economy?

Mike Sangiacomo: There are people taking that material and trying to find reuses for it. Again here in San Francisco some of the other committees we operate in, we take that material, separate it. We find uses for wood, for gypsum, for metals, for cardboard, heavier plastics and a few other things that end up as construction waste. We probably recover 50% or 60% of that material. We take that material and grind it up and add some non-VOC emitting colorings to them and use it as groundcover. It looks nice but it also retains moisture in the soil. We take gypsum and it's a great soil amendment certain types of land. If you’re going to grow crop, you need to understand the makeup of your soil the pH of it and what else is in it what nutrients is in it what it needs. Soil scientists will determine that and will put additives in the compost materials so that they only have to make one application. And in some instances gypsum from old sheetrock is a valuable soil amendment.

Greg Dalton: You have an artist in residence program and I remember a display one time in San Francisco International Airport where there was a big Jeep made out of Styrofoam. Pretty cool stuff. So tell me about the artist in residence program what they do.

Mike Sangiacomo: When we started that almost 30 years ago the idea was there is so much material being thrown away that ought to have another use. That giving artists a chance to see what's being thrown away find things they can make art from. In doing that to educate people that there are other things you can do than just throw this in a garbage can or throw it on the street and not worry about it anymore.

So we have had almost 200 professional artists over the last 29 years working at our facility

they scavenge in our public resource recycling area. They come in with an idea what they want to do and then they just start seeing things. And often they go off a little bit on a tangent because they're just blown away by how much material and the wide variety of things that they can do. So in 30 years we've had, it start out mostly art sculpture, metal sculpture. A few people were doing things like making clothing out of materials that were thrown away. We've had some performance art, including a fellow named Nathaniel Stookey wrote a 14-minute classical piece called "Junkestra" where he found things in the public recycling area found their natural note without modifying them in any way. Pipes were left the length they were, pieces of wood anything else left the way they were and he found their notes and created this piece that has been performed originally here in San Francisco, been performing around the world including at the Kennedy Center in DC. YouTube, Junkestra, 14 minutes of fun listening.

But we had an opening just this last, an art opening at the end of a couple of artists recently just this last weekend. And both these artists saying, you know, we came here thinking we were gonna do something and then we start seeing all the stuff we're getting these ideas and the employee tell us, if there's something you want just let us know, it will come. And the answer is, in both of their cases he said within two days the things they were asking for came. That's just the way it is at the dump.

Greg Dalton: You've been listening to Climate One. We've been talking about innovative approaches to recycling, with Mike Sangiacomo, president and CEO of Recology.

My other guests today were Beth Rattner, executive director of the Biomimicry Institute, Peter Templeton, president & CEO of Cradle to Cradle, and John Lanier, co-author of Mid-Course Correction Revisited: The Story and Legacy of a Radical Industrialist and His Quest for Authentic Change.

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Kelli Pennington directs our audience engagement. Tyler Reed is our producer. Sara-Katherine Coxon is the strategy and content manager. The audio engineers are Mark Kirchner, Justin Norton and Arnav Gupta. Anny Celsi and Devon Strolovitch edit the program. Dr. Gloria Duffy is CEO of The Commonwealth Club of California, where the show is based. I'm Greg Dalton.