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Reimagining Waste: Interview with Brightmark CEO, Robert Powell

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Reimagining Waste

...an interview and dialogue with Founder Robert Powell

Overview

With the occurrence of the United Nations' COP26 Climate Change conference in Glasgow, Scotland in November 2021 and the ultimate passage of the *Infrastructure Investment and Jobs Act* in the United States, serious attention has been given to planetary demise, the activities contributing to this existential reality, and possible solutions that can be explored and implemented. Many clean-energy operations will undoubtedly be promoted and innovation in clean, carbon-reducing technologies incentivized within the next decade.

And while there are many burgeoning business entities touting cleaner futures, there must be a strict analysis of each company's business strategy, mission, and vision. "Waste to energy" indicates a promising trend, but the processes used must be closely scrutinized to determine whether the footprint is deadlier than the greenhouse gas emissions (GHG) savings. Additionally, the prospect of closing an established "waste-to-energy" business facility may come into play, especially if the amount of waste is curtailed and no longer an attractive motive to keep operations going. Thus, if the *raison d'être* no longer exists, it would make little sense to begin or to perpetuate such a time-consuming and expensive operation. And if successful, why wouldn't consumers be encouraged to generate more trash - the accumulation of which guarantees business longevity?

Ostensibly, one area requiring immediate global attention is the rapidly growing problem of plastics pollution. According to the *UN Environment Program* (UNEP), 300 million tons of plastic are produced and disseminated annually - equivalent to the weight of the entire human population. The majority of plastic items are discarded in landfills and in waterways and oceans, with only a very small percentage actually being recycled. Plastic straws, bags, and single-use bottles are being banned, community by community, but the pace of production, use, and disposal greatly outweighs any of these efforts. Rather, education in the subject must be advanced and reduction efforts accelerated by new laws, business policies, and revised consumption habits. The toxicity of these plastics is widely documented as posing known carcinogens to those communities impacted by their manufacture and disposal. A general rethinking of how plastic waste should be handled is critical.

In this vein, the San Francisco-based company Brightmark was formed. Its founder, Robert “Bob” Powell, self-titled “Head Changemaker,” implemented a vision of converting hard-to-recycle-plastics into gases, new plastic products, and energy through this new company. Brightmark is developing its largest facility to date in Ashley, Indiana. The corporation was founded at a time when the accumulation of plastics had become globally ubiquitous and the disposal of same via recycling or reuse practically inconsequential.

On October 16, 2021, JVBL editor Elizabeth Gingerich engaged the team leader in the following discussion with assistance from Brightmark’s SVP and Chief Marketing Officer, Chrystal Boone, and Marketing Specialist Kendal Powell.

EG: Good morning. Preparing for this interview reminded me of readying a discussion with the late Ray Anderson, founder and former CEO of Interface Flor, who had a similar vision for a sustainable business and was a fellow Georgian.¹

RP: *Yes.*

EG: You have spent a number of years in the energy sector. And now a refocusing of sorts with Brightmark at a time when plastics have become incredibly endemic to our economy and to

¹ See *JVBL*. “Climb to Sustainability: interview with Ray C. Anderson” at <https://scholar.valpo.edu/jvbl/vol2/iss1/3/>.

our way of life – but poorly managed at their end of use. With Brightmark’s operations, are you using a type of polymer science to place plastics into more of a circular economy?

RP: *I believe that maybe the main motive is what is the best way to solve the problem, in this case, plastic waste, and we think about other forms of waste that as well. One of the solutions is definitely polymer science – chemical engineering – and we think that if you are trying to solve the problem, you shouldn’t be beholden to just our one solution, so there are things like the reduction of the use of certain plastics, like plastic straws. I actually will pause before I use a plastic straw...does it have anything to do with our solution? No, not really. But I really believe that it has to do with what our team is centered around: how do we solve the problem and be genuine about the solutions? Is our technology one great tool to solve the problem of plastic waste? Absolutely. However, we need many solutions and preventative measures.*

EG: Now does this involve incineration? You mention on Brightmark’s website that the company is diverting objects from going into either landfills, waterways, or incinerators. But isn’t the heating up of pellets that have been created – isn’t that a form of incineration or is this more like the process of conversion?

RP: *Yes, this is conversion. However, there are two different processes that we are talking about here. The fundamental thing that we are doing is that we are taking bales of post-use plastics and turning them into pellets. Then we put them into long, stainless steel containers, 8’ in diameter, 60 feet long, and in an oxygen-starved environment, heat those pellets up to create the liquids and gases for making usable products. We are not incinerating the plastics, as no burning occurs without oxygen. This Plastics Renewal is the optimal solution to create the maximum amount of reused products out of plastic waste. If we were incinerating, the value would be much lower because we would effectively be destroying those really important hydrocarbon effects. We do heat the vessels up – currently with natural gas – and that heating process does create emissions, however the emissions are at a level of roughly a medium-sized hospital.*

EG: To better understand the process of conversion – is this pyrolysis² or gasification³ of plastic waste?

² The pyrolysis process refers to the thermal decomposition of materials at elevated temperatures in an inert atmosphere, resulting in a change of chemical composition.

³ Gasification refers to the technological process that can convert any carbon-based raw material such as coal into fuel gas – in essence, synthesis gas.

RP: *It's pyrolysis. Not gasification. Gasification actually involves using oxygen to combust materials in order to create a send-gas type of thing. So, it is a unique type of pyrolysis.*

EG: So, are you restoring the used polypropylene to produce more of a virgin-like quality to these plastics?

RP: *We are. Currently, a portion of the stream we create is converted into transportation fuels. The life cycle analysis (LCA) issued recently shows the offset of fossil fuels that are extracted from the ground offer a -39% to -139% improvement in GHG emissions. Additionally, another large portion of the products that we create is used as feedstocks to remake plastics.*

EG: In terms of using natural gas to heat up these elements, are you doing anything to offset that carbon footprint?

RP: *It is in our plans in the future to do that and this journey that we are on began with the original plans 20 years ago, leading to this point of the commercialization stage. As this is the first plant of its kind, some of our goals are set further on in the journey. So envision us in the future, for example, instead of using combustible materials that utilize electricity to heat our vessels, they could be powered by solar or other forms of renewable electric generation. For now, that isn't the case ... you've heard that term, "Don't let perfect be the enemy of good." We are on this path to a better, more perfect solution.*

EG: How many acres do you own or are you leasing in Ashley, Indiana, with your new facility?

RP: *I am not sure.*

EG: I am just wondering if there is enough room for renewables. Is it ownership or leasing?

RP: *It's ownership.*

EG: So is there enough room to install solar PV or even to plant trees for that matter? I was looking at Milliken's⁴ website and they have 130,000 acres, I believe, of sustainably-managed forests basically used to offset their carbon footprint. I was just wondering if that scenario is feasible here.

RP: *I love it. In Ashley, we do not have a sufficient footprint to employ solar in that particular location, however we do anticipate expanding that location. I will say, we announced that with the next facility that we build which is in the middle of Georgia – Macon, Georgia – our design elements for that include interaction space for folks in the community and a lot of green space around it. We are also trying to figure out how we integrate into an innovative building design the solar elements, for example on the rooftop. One of my thoughts about these projects in reducing the carbon footprint is to create sustainable solutions. We are changing the landscape in sustainability and reimagining waste, and our goal is the add value to these communities. And part of that is the green space, the ability of people in communities to interact and come together with the common ground of bettering our world.*

EG: As long as everyone is masked and vaccinated....

⁴ Milliken & Company is a global industrial manufacturer and manufacturer.

RP: *Right. I have to remember what state I am in ... so I am back home in California right now and I walk in yesterday to a restaurant and grab lunch and I had to show proof of vaccination, but you go to Georgia or Indiana, you are not required to do that.*

CB: *Did you mention the circular recycling program that we employed throughout the construction process in Ashley as well? Throughout the construction process at our Ashley facility, we have reclaimed all plastic waste from the construction process and recycled all of it through our proprietary pyrolysis process.*

EG: How about the other construction materials in addition to plastics?

CB: *The plastics were our focus but our goal was to create minimal waste impact from the entire construction process ... and Bob, I think that something else that is notable if you want to elaborate on it are some of the circular elements in our process and the energy that run our processes at that facility.*

RP: *There are a couple of things there that Chrystal is referring to so, for example, when I told you that as we heat the plastic pellets up in our stainless-steel pyrolysis or plastic conversion units there is a liquid stream that comes out and a vapor stream that comes out. That vapor stream we feed back into the heating elements down below and so we reutilize the gas stream that come out of our process to displace pulling natural gas which traditionally would come from fossil fuels out of the ground. The other part of the process that we don't often talk about is we are utilizing a patented water technology that allows the water quality of our processes to be superior to typical wastewater treatment processes. In addition to the fact that earlier you spoke about creating new plastics out of the plastic waste. The circular nature of what we have now, we would seek to maximize in the future. You can't theoretically get to 100% of re-making plastics out of plastics but probably somewhere in that 80% to 90% range fully creating plastics out of plastics in the future.*

EG: After I interviewed Ray Anderson, I toured Interface's plants in LaGrange, just south of Atlanta. The company takes even its competitor's used carpets, and breaks down the product into its various elements after which the renewed materials are appended together through a heating process. The energy used to create the new product comes from capturing methane from area landfills. Now Indiana as well as Michigan – where I believe that Brightmark also has a facility – have had the greatest number of landfills per capital in the United States at least in the near past. Michigan has taken in Toronto's waste and Indiana Chicago's. There is a tremendous methane market. Also, with the presence of Tradebe in East Chicago (hazardous waste) and Pratt Industries (corrugated cardboard recyclers) in Valparaiso, Brightmark appears to be completing a triangle of waste management facilities. Were there specific reasons as to why Brightmark chose Ashley? Are there specific tax incentives?

RP: *There are a couple of reasons but the most important reason is that the community wanted us there. They recognized the better environmental outcomes and they wanted us to come to the community.*

EG: Did they reach out to Brightmark? How did they know about Brightmark?

RP: *Yes – they knew about us via our early partners, and they brought attention to Ashley area including Ashley, Angola, Auburn. We were connected to Wayne Plank and his trucking company as well as to others. Once those connections were made, it was pretty clear to us*

that the community wanted us there. They supported what we were doing and they also thought that it was great to create long-term sustainable jobs that were paying good wages and they wanted us to be there. I could say that that Northern Indiana area is quite interesting because of where resource materials are from, that southeastern portion of Chicago, Detroit, and then Indianapolis. It's a really good triangle as well in terms of sourcing the end-of-life plastic feedstocks necessary for our process.

EG: I'm going to ask you something a little more personal. Over the years with interviewees, I always want to know what makes them tick. What were your influences growing up? With Ray Anderson, it was largely about an instance in the mid-1990s when he was handed a book – *The Ecology of Commerce* – and it turned his whole life and his whole business mindset around. And Ray changed me. On Brightmark's website, you mention Richard Schwartz who was influential. Where were other people who had an impact on you; that stimulated an awareness, ultimately creating a visionary?

RP: *That's nice of you to say that, but I am one of many who are trying to solve problems. There are some very personal moments in my life that brought me personally – and everybody has a different story – to where we were able to found Brightmark. The first one was my grandmother – my sweet, amazing Southern grandmother. When I was young, I used to spend time with her in the garden. She had this amazing green thumb, and I remember her talking about what we should and shouldn't be putting into the garden. She had these amazing beefsteak tomatoes – what we should and shouldn't be doing in terms of what pesticides. When she told me that, it wasn't as much about the impact just on the vegetables but it was the impact on the environment. She told me "Hey, you need to think about what you put into the garden because the pesticides – when it rains – will go into the creek over there and then flow down (we have this big river in Atlanta – the Chatahoogi flow out there) and it impacts the whole environment. We are talking about a long time ago before environmentalism as we know it really hit. So that stuck with me but it wasn't the only impetus for my current mission. When I was a partner at Arthur Anderson, I helped clients in the energy industry buy power projects or companies that owned power projects and I got to travel internationally. I flew into Indonesia, to Jakarta, and I went from the airport to my Western hotel and in incredible traffic, the taxi would take me around through all of these neighborhoods. First off, I was not a well-traveled kid from the States in this amazing international environment. I saw a small mosque and all of the colors just astounded me. There was a lot of goodness with this. But there were kids who were about the age of my oldest, Shawn, who was about 4 to 5 years old at the time, who were playing in open sewers. They were running back and forth over them and there was just garbage strewn all over the place. And that was a moment of awakening – wow, what is this, right?*

EG: I lived in Brazil – a very similar situation. Playing in the sewers, the garbage.

RP: *Where did you live?*

EG: Niteroi. Across the Guanabara Bay from Rio de Janeiro.

RP: *I love Brazil and I saw the same thing there. That was after I had the experience in Indonesia. But are they not some of the most wonderful people?*

EG: Yes. Except for Bolsonaro taking down the Amazon Rainforest.

RP: *Don't even get me started. There were other things on my journey. I would do due diligence work for clients who were buying our projects, and I remember looking at environmental reports for 5th generation plants around the ash ponds. They throw the dust into this big pond and in the early days there were no liners on the pond. I looked at the environmental reports and all of them had trace mineral elements – all of the bad stuff that happened to the water tables. What blew me away was the view of the companies that was not “How do we prevent it?” but “How do we figure out how big the liability could be?” So after the fact – even when we know all of the bad stuff we are doing – we just want to know how big the liability could be measured in the financial statements. As I looked at more and more of these reports and did research, I kept thinking this is not the way we should be approaching things. We need to deal with the waste and not after creating environmental issues. We've got to figure out how to deal with it at the source. That was the final turning point. I was then recruited to come to San Francisco and become the chief financial officer of a utility right here in San Francisco.*

EG: Was this PG&E?

RP: *Yes. Pacific Gas & Electric. Literally across the street from where I am sitting right now. Pretty amazing. This was about 16 years ago. We were right at the beginning of renewable energy in the State of California. We were among the leaders in the world and we had this goal that by 2020, 20% of our electricity needed to be procured renewable energy. We were scared that we would never make it. Well, PG&E blew it out like way before they hit 2020. Contrast that to not dealing with waste but quantifying it to how do we fix it – with a big ambitious plan. That was the final point for me and then ultimately, I thought that I wanted to be one of these folks who is actually doing projects on the ground. That's when I left and became the CEO of my first company in solar energy in the early days. That was the journey of realization. But it started with my grandmother in the garden.*

EG: So she introduced you to the concept of stewardship?

RP: *Very interesting you say that. Absolutely she did. Let me also introduce you to this book.*

EG: I believe I saw that as one of the notes on Brightmark's website?

RP: *The “Unnatural History of the Sea” by Callum Roberts. I have someone who has become a friend, Guy Harvey, I don't know if you are familiar with Guy but he's an artist and an environmentalist and his art is all about the oceans. We've actually partnered with his foundation to create educational programs that we are super excited about, but the reason I bring up this book is because the journey is not over. This particular book has blown my mind in terms of the impact we as humans have on the environment. The abundance of life that used to be there – it is now gone and first-hand accounts of what different explorers saw in the 15, 16, 1700s and so on, and the progressive destruction of the habitats...*

EG: And you have seen the recent reports of species extinction – are we not just going down the rabbit hole as quickly as possible?

RP: *Yes, we are. And I think that some of it is irretrievable. One of the other lights I got out of this book – I sort of dove into it about a year ago – is that our current baseline is different than the baseline that he talks about in the book. What I worry about is that the youth of today – I don't know about you but I'm not a youth. When you talk to the divers who went down to look at a coral reef, it's not what you see now. I am worried about our changing baseline. I*

think that we need to be more ambitious about trying to restore it back to the original state and I think that if we lose that memory of what it used to be like, we're doomed.

EG: Two verbs associated with climate change are *mitigation* and *adaptation*. Too many people are worried that we have reached a state of complacency by just embracing adaptation. We keep raising that baseline, we adapt, we do not mitigate. We don't fight. We are Thelma and Louise holding hands going off the mountain; that is basically what is happening here.

Let me just ask you – as I have taken this from your website: “As we scale this footprint, we are going to need a lot more plastic...So we also launching the largest solicitation for plastic waste.” Now when I read that, I think of the 3 Rs – reduction first, not “bring me more plastic!” but “Let's reduce the plastic we have.” Obviously, you are not saying that everyone create more plastic. We just want to collect the plastic that's there – that's what I understand. And then are you adding a couple more Rs? I already heard you use the word, “restore.” We have been working with Subaru over the years – sending our MBA students to its facility in West Lafayette, Indiana. The company has gone beyond the 3 Rs and begun to restore the original brownfield it was located upon to restore wetlands around their facility. It is just amazing what they have done. And then the other R is “regenerate” – it seems to me that Brightmark is engaging in those 2 Rs – restore and regenerate.

RP: *Absolutely. So restore and regenerate are really a big deal. When you think about the model that we have had which is, take from the environment, use, and dispose – it's a straight line. That's not restorative at all.*

EG: That is not circular.

RP: *It is not circular. We do have to take from the environment. As living creatures, we have to eat, and things like that. When we take, we need to restore and regenerate. The ideal state is to have zero impact on the environment. It may not be totally achievable to have zero impact but absolutely – restore and regenerate are important to us.*

So let me highlight something here. There are other areas where we can touch lives beyond just the plastic renewal process that we have, beyond the intensely negative carbon renewable natural gas projects that we have. One of the examples we partnered with is this amazing company, RecycleForce, in Indianapolis. In fact, I was there for the groundbreaking recently in Indianapolis for their new facility that they are building that in 18 months is going to provide them with an even bigger hub, so what do they do at RecycleForce? Well nominally, they take electronic waste and then pull out the useful products and send to us the plastics so that we can renew and regenerate. What they are really doing is renewing and regenerating lives because their workforce is formerly incarcerated individuals. One of the tragedies of our society is that waste of human capital.

EG: Especially in light of the 13th Amendment's sanctioning of slavery in the form of incarcerated individuals working for free or for very low wages.

RP: *Exactly. And if you look at the makeup of who's in prison.*

EG: Disproportionately black males.

RP: *It's a societal ill. The team at RecycleForce are regenerating the lives of those formally incarcerated men and women, certainly of various races, but if you look at the makeup of*

Marion County, predominantly African-American, Black individuals and they give them training, jobs, mentoring, and are really helping to regenerate and restore lives that may otherwise might be lost. Their recidivism rate is about 20% whereas the average in Marion County and certainly nationwide is 70%. 70%!

EG: But you have to wonder who is making the arrests and who are the arrestees. With recidivism – that's a whole other topic – with recidivism, you have been re-arrested. But for what? Who arrested you? Was there a bias in making that arrest?

RP: It is! The system may continuously perpetuate the problem here. So do realize if they do not pay – and I forget what it is – it's for folks who almost have no income and no skills oftentimes. If they do not pay for the monitoring bracelets, effectively for their parole officers, they go back to jail. So it is set up that when they leave prison, they are already below – they are in a negative hole.

EG: The justice system is designed to do that. There's a circularity right there.

RP: We are so delighted that Gregg Keesling and the team there at RecycleForce are breaking that cycle and hopefully creating a virtual cycle. We are working on ways that when some of the folks graduate from the RecycleForce program, to hopefully work with us at the facility in Ashley. We are extremely excited about it. And you know that they reprocess e-waste. Since we started up, they have been sending crews to work with us; they have been doing this for much longer than we have. We view our work as being more than just the things that we are directly doing. If we can positively touch our communities with restoring and regenerating lives and the waste products, then it is this amazing goodness that we are creating. Something that is larger than just products.

EG: You opine for environmental justice within segments of your website. In terms of your workforce at Brightmark – what percentage of your workforce is people of color?

RP: Brightmark has ambitious long-term goals to improve diversity, equity, and inclusion throughout the organization. I come to this topic humbly. I'm still learning, and I focus a lot on listening when these conversations arise. Diversity, equity, and inclusion is one of Brightmark's core values. We're holding ourselves accountable to build a deeply inclusive workplace that we are proud of.

EG: Of course, when you are looking at environmental justice, you're also looking at where the plastics, the chemicals, are generated in relation to poor neighborhoods. So your facility in Michigan – I believe that it is close to Benton Harbor – where they just uncovered a lead-in-the-water crisis, a second Flint. Ashley I am assuming is not diverse in its population?

RP: I would agree.

EG: Pretty much all white, right?

RP: Yes.

EG: As a member of a family that worked to desegregate the Valpo community since 1970, it is hard...it has been a constant war. Ongoing racism is percolating in our schools and throughout our nation. It is a constant struggle. So I applaud Brightmark for consciously making sure that its workforce reflects its morals, principles, and values. I'm just wondering

in terms of populating these sites (Benton Harbor is predominantly Black and Ashley is predominantly white) – if you have liaisons to make housing, for example, possible for new workers in these areas. With respect to your 5-year plan, you must be constantly adding to it.

RP: *Right. In some way.*

EG: You really came upon the scene in 2019 – and were given much national attention and recognition.

RP: *Yes, I think that is true. We were founded August 1 of 2016 and we spent a lot of time, sort of away from the public, making sure that our strategy was right from the projects and the solutions that we were offering. I think the coming-out party if you will was as we broke ground at Ashley. It isn't coincident that at that time, we began to tell the story. I think that telling the story is certainly, in part, about telling the Brightmark story but I think that it is just part of a broader movement. If you look at what we are talking about on social media and other public fora – it's about the broader movement, the village. I closed the finance package in April of 2019 for that plant – we have become more visible. I think that visibility and the positive outcome about what we do are important stories to tell so that gives people hope – hope that they could do things like this and then hope that Brightmark will become part of that solution.*

EG: Speaking of the larger village, will Brightmark have any influence or representatives at the COP26 in Glasgow next month?

RP: *We won't but I would love to. I would say that our hyper-focus right now is on completing the start-up of Ashley, as well as we have a lot of carbon-negative natural gas projects that are under construction. We look forward to supporting COP26 outcomes and exploring how Brightmark will become a part of the solution- and how we can support in the broader sense.*

EG: You are just one person.

RP: *No, I'm not. If it were just Bob, this all would not be happening. There is a team. In my role, I need to be very focused on execution. But I look forward to being able to participate in some of the broader environmental initiatives. And you will see me doing more. You can probably tell, like you said, I've traveled extensively. I try to do as much as I can.*

EG: Do you travel by private plane?

RP: *No.*

EG: Well that's how it should be with one's carbon footprint too. Every time I fly it has to be out of necessity.

RP: *You should know that one of the products we create is jet fuel. I would rather make plastics out of plastics but believe it or not, we can create jet fuel.*

EG: In relation to your renewable natural gas projects, it is interesting to note that one of the largest student-run biodigester projects is in Lansing, Michigan, on the campus of Michigan State University. You are not that far away in Ashley.

RP: *I toured that a few years ago; I love what they do.*

EG: We would love to replicate that on this campus with a partnership with United Airlines in Chicago with its use of biofuels, sustainable aviation fuels used currently in flights from Los Angeles and San Francisco.

RP: *Bio jet fuel? Yes – one of the companies participating in that is a company that we have spent a lot of time getting to know well, Neste. They are based in Helsinki and I think that it is really cool what we are doing there. It still is a combustible material but if you displace fossil fuels and use a process like that, all of the incredibly inefficient methane emissions that come out of both the wells and the transportation system are avoided. In turn, we are displacing all of the greenhouse gases that occur when you extract fossil fuels from the ground. I think that's a great solution while we transition to different states to determine what we use to power airplanes, and cars, and all of that stuff.*

EG: Last comment on the “don't let great get in the way of good.” It reminds me of my interview with the former Minister of Environment in British Columbia. That province operates on 100% (97% of which is hydro) clean renewable energy with the exceptions of their transportation and agricultural sectors. And I asked as to how those remaining sectors could be brought into compliance – and here is the “great versus good” analogy. The Minister replied, “it's like that overweight person losing the first 100 pounds very easily but that last 15 pounds is just so stubborn... that takes awhile.” I see that there are some synergies between visionaries there.

RP: *But this is where baselines are good – like shipping baselines because what is the last 20 pounds. We look at the last 20 pounds and then determine how we tackle that. And that if we even get 80% of that, we shift the baseline on that remaining amount. So that is really what the process is doing. You cut off that 80% and you have 20% remaining – that's now the new 100%. How we tackle 80% of that. And ultimately you can get to that. I think that perfection is ultimately not achievable although I am hopeful, but you can go a long, long way if you are constantly changing your baseline. And I talked about the 2020 targets? 20% by 2020 in the State of California? They did exactly that. Now, if you look at the procurement levels, they changed the targets, increased them, and in the State of California we have done an amazing job here with getting the next bit out.*

EG: As reflected by the City of San Francisco – you have ordinances that need to be replicated...in terms of gas appliances indoors, in terms of new construction solar. You are the 5th largest economy in the world so what California does, what San Francisco does, really sets the pace for others.

RP: *I think so. And I think that the leaders in the State of California have done some amazing things. I think that renewable energy, energy efficiency – all of those things that you talk about are great examples of what can be done. Germany, Italy, Spain, the State of California, the New Jersey REC standards (Renewable Energy Certificates) all helped what was once very expensive in solar and wind and drove down the costs. In 2009, when I became the CEO of my first company Solar Partners, the price of solar electricity was 10 times what it is now. We are now at 10%. So what happened? If you look at the marginal cost of electricity, you now find that solar and wind are better priced, on average, than coal-fired generation, natural gas generation...although natural gas generation is pretty close...and nuclear would be the only one where, you know, long-term may be lower. It went from being non-economic to be economic because of the goals and targets as well as the investment that communities made in terms of doing more of it, because when you do more of it, people get better at it so that's*

how we went from 10 times the price in 2009 to where we are now: to be competitive with a cleaner profile.

EG: Last question. With “the village,” you obviously know how important networking is in business. I am looking at some of your past and some of your current partners: Chevron, BP, and you have a MOU in the EU, you have Indonesia through Singapore, 4-H... I’m looking at a long list. In terms of waste, especially with respect to the import tariffs that were levied between China and the US starting in 2017, stymying recycling...so much of that electronic waste goes to developing nations, developing economies. Has there been an attempt to make a connection with what emerging economies in Latin American, within the African continent, extracting what has been dumped there? Because usually what has been deposited there is just incinerated or simply just dumped. Mining the waste. Bringing it back. Anything in the network happening to this effect?

RP: *When you say network, you are referring to Brightmark and what we are doing?*

EG: Yes. Potential partners or programs.

RP: *One example would be ... earlier this year we announced that we signed an MOU with SK (Global Chemical) out of Korea. While Korea is more of a developed nation as opposed to developing, that partnership is a sign of what we would like to do in Asia-Pacific. You talked about Latin America and Africa – those are areas that we need to focus in on. But if you look at the plastic waste issue in the oceans...8 of the top 10 polluting rivers come from the Asia-Pacific region in terms of what’s going there. So we believe that with the plastic removal, that if we are going to be a participant in solving the problem, we need to be in the developing countries in Asia. You will see more. There are challenges but opportunities in developing Asia. One of the challenges is the infrastructure on waste management and not being as robust in some of the more developed communities. There are folks that we admire and who knows - maybe in the future we will work with. We admire folks like 4ocean. I have got 2 bracelets on me right now and we are extremely excited about what they do. We hope that with folks like them we can solve the waste management issues because they are finding ways to collect in communities that would otherwise have challenges with traditional waste management systems.*

EG: Are you on the “Mechanical Recycling” level on the Milliken scale?

RP: *No, we are not. Pyrolysis is different than mechanical recycling because we effectively break apart the molecules into smaller micro-carbon chains. Mechanical recycling is not breaking apart the molecules per se; it’s in the preexisting lattice of hydrocarbon material. Just chopping them up and maybe melting them a little bit. Mechanical recycling currently represents about the 9% of plastics - of all the plastics we use and dispose of that are reused. Mechanical recycling is great, but it can’t deal with the larger 91%. So what we do? We are very fortunate that the inventors who invented the plastics renewal technology over 20 years ago were able to figure out how to recycle ALL plastics. Mechanical recycling generally only deals with the 1s, the 2s, and then the 4s sometimes. We can deal with the all plastics types 1-7 and as you can tell at our Indiana facility and with the announcements in Georgia, Europe and South Korea we can do it at a scale that makes a difference globally.*

Figure 1:
Milliken's Zero
Waste Hierarchy

EG: So would you be at “Advanced Recycling?”

RP: *Yes.*

EG: So you are above “waste-to-fuels” energy then.

PETE	HDPE	PVC	LDPE	PP	PS	OTHER
polyethylene terephthalate	high-density polyethylene	polyvinyl chloride	low-density polyethylene	polypropylene	polystyrene	other plastics, including acrylic, polycarbonate, polyactic fibers, nylon, fiberglass
soft drink bottles, mineral water, fruit juice container, cooking oil	milk jugs, cleaning agents, laundry detergents, bleaching agents, shampoo bottles, washing and shower soaps	trays for sweets, fruit, plastic packing (bubble foil) and food foils to wrap the foodstuff	crushed bottles, shopping bags, highly-resistant sacks and most of the wrappings	furniture, consumers, luggage, toys as well as bumpers, lining and external borders of the cars	toys, hard packing, refrigerator trays, cosmetic bags, costume jewellery, CD cases, vending cups	

RP: *Yes, we are. We do not produce monomers but sort of the molecular part is what we do. We actually can produce monomers. We are right in that advanced recycling block. So if you*

look at our social media and public facing messaging? This is about solving the bigger problem. We talk about re-think, re-design, reduce, and even reuse. We are fully in favor of this Zero Waste hierarchy and people will say, "well gosh, does that mean that if we find a way to do all rethink and redesign and solve the plastic problem, don't you folks at Brightmark fear that?" I don't fear that at all because we are about solving the problem; if we solve the plastic waste crisis that we have with other means, we are going to do other stuff. We'll find other environmental problems to solve. I really believe that if you are true to the cause, you look at what are the best ways of solving the problem.

EG: So it all comes down to the question as to why we are on earth. If it's not serving people and solving problems, what's the point?

RP: *Then you are solving for the means and not the ends and I have a huge issue with solving for the means. We end up serving this beast that doesn't solve problems and we become so dogmatic about the means that we totally lose sight of what are we trying to do here. The term "stewardship" is so spot on. My business partner from the Jackson Investment Group uses the term "stewardship" all the time and I think it's a lovely thought. Stewardship is a theological belief that humans are responsible for the world and should take care and look after it. So let's do that.*