Episode Title: The "PIPing" Point -- A Conversation with Kelly Scanlon, DrPH, Director of EHS at IPC

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Lynn L. Bergeson (LLB): Hello, and welcome to All Things Chemical, a podcast produced by Bergeson & Campbell, P.C. (B&C®), a Washington, D.C., law firm focusing on chemical law, litigation, and business matters. I'm Lynn Bergeson.

This week, I had the pleasure of sitting down with Dr. Kelly Scanlon, Director of Environmental Policy and Research, Global Government Relations at IPC. IPC, as many of you know, is an organization accredited by the American National Standards Institute as a standards development organization. It publishes the most widely used acceptability standards for the electronic industry. Kelly was brought in at IPC in 2019 to direct environmental health and safety (EHS) policy and research, a role that has become critically important, given the certain Toxic Substances Control Act (TSCA) rulemakings that have extended TSCA's jurisdiction to the electronic product industry. These regulatory developments, implemented against a backdrop of supply chain disruption occasioned by COVID, have made for a very eventful few years, likely quite unexpected by Dr. Scanlon. We discuss with Kelly IPC's work on EHS policy, enhanced regulation of articles under TSCA, and other challenges the electronics industry faces. Now here is my discussion with Kelly Scanlon.

Dr. Scanlon, I am so delighted that you are here with us today. I've been looking forward to our conversation for weeks. Just by way of background, you were named Director of Environment, Health, and Safety Policy and Research at IPC in April 2019, if I am correct. Perhaps for our listeners' benefit, could you give us a little background about yourself and perhaps explain a little bit about what IPC does?

Kelly Scanlon (KS): Yes, and thank you so much for making time to have me join you. It is really exciting, and I treat this as just really a special opportunity to engage with you and your audience on really interesting topics, so I'm excited for this conversation today. Yes, April 2019 is when I joined IPC, but going back to "Who am I?," I am a public health scientist, and my focus within public health is environmental and occupational health. I have a Doctor of Public Health degree from the George Washington University here in D.C., and I have a

Master of Public Health degree from Emory University in Atlanta. I also have a professional certification. I am a Certified Industrial Hygienist, CIH.

I'm glad to report I feel like I've done some really interesting work in the profession of environmental and occupational health. I've been the health and safety lead at a university. I've been a consultant to several different executive branch agencies, including [the Occupational Safety and Health Administration] (OSHA) within the Department of Labor, National Park Service, Bureau of Indian Affairs within the Department of Interior, [National Institutes of Health] (NIH) within [the Department of Health and Human Services] (DHHS). I've been a fellow at the [U.S. Environmental Protection Agency] (EPA), and I've been on assignment as an [Intergovernmental Personnel Act] (IPA) from George Washington University to the Department of Defense (DOD).

In April 2019, as you pointed out, I joined the government relations team at IPC, and this is the very first time I am working on a government relations team. It's the first time I'm working for an industry association, so kind of all new still to me. I very much like working at IPC because of a really interesting science policy portfolio: TSCA, the Toxic Substances Control Act, is definitely a higher priority policy issue, as well as other chemical and product policies, including [the European Union's (EU) Restriction of Hazardous Substances Directive] (RoHS) and [EU's Registration, Evaluation, Authorization and Restriction of Chemicals] (REACH), as well as the Circular Economy Action Plan and substance-specific policies on lead and [per- and polyfluoroalkyl substances] (PFAS), and flame retardants, so really kind of cool.

IPC is a global association for electronics manufacturers. I can't stress that globality enough. We represent the industry that makes electronics and electronic-containing equipment. We have more than 3,000 member companies. It always blows my mind when I think about thousands of different member companies around the globe who are making electronics, and that many of them are members of our association. We as an association therefore have offices in multiple locations around the world, including India and Asia, as well as the United States, and the companies that our members represent that entire electronics manufacturing supply chain. So pretty cool.

IPC began as a standards development organization, SDO, and it continues as such. IPC is a primary developer and deliverer of standards, as well as education services to ensure a trained and certified electronics manufacturing workforce, and we are also a source of industry advocacy. And that's where I come into play. As I mentioned, I work on the global government relations team, and we're headquartered in D.C. One last thing about IPC, just in the last year or two, we updated the tagline for the association to "Build Electronics Better." I'm really embracing and proud of that tagline to build electronics better. That means not only economically and technologically, but environmentally, so the association is about advocacy, thought leadership, but it's also about innovative solutions, education, training, certification, industry standards, those things that enable the industry -- the electronics manufacturing industry around the globe -- to make those reliable, high-quality products. To me, a cool, cool place, cool thing to be doing.

LLB: It's a wonderful place for you to express all of your many credentials, Dr. Scanlon. My goodness, you have an incredible pedigree, and so IPC is lucky to have you. Let me ask you a question about what kinds of standards, in particular, IPC issues. Are they standards to make electronics function better? Or are they EHS standards to make the development, implementation, and perhaps recycling of electronic parts more circular and better? But what kind of standards do you issue?

KS: Yes. Thank you for that, because everything you just said is what I would love to see. Right now, though, IPC is more focused on those standards for designing and manufacturing electronics, and it has been, really, for more than 50 years. So currently, there's more than 300 different industry standards, and these are consensus-based standards. We have multilingual standards covering pretty much every single stage of the electronics manufacturing life cycle, from product development through the issuance of that end product, or finished product. So there's thousands of electronics industry professionals who volunteer to participate in that standards development process. They are consensus based. They are aiming for quality, reliability, consistency, and -- because we've been doing it so long -- that process is very embedded and understood. So I'm excited to see that expand to what you were just saying.

Currently, we're not in the space of developing standards around EHS, or even circularity. But again, we have this very strong base of standards and a very strong process. So let's explore where we can go with that to build electronics better, again, not just economically, technologically, but environmentally. I'm excited to report, really, just in the last few years, IPC has updated or even created standards on materials declaration and data exchange, which is relevant to the discussion around communication of information on substances like chemicals and materials.

LLB: Absolutely.

KS: Manufacturing and supply chain traceability of electronic products. So those words -- supply chain traceability -- like wow! Exclamation point. That's useful. Trusted electronics design and assembly requirements, that's around how do we know what we're making and make it well? We have some exciting movement forward on what's called the Connected Factory Exchange, or CFX, which is really a backbone of the factory of the future, where we're enabling communication, not only between and among the machines on the factory floor, but also beyond that to the upstream and downstream suppliers. We are covering topics including e-textiles, or electronic textiles. We just have a new standard in the last few months on green cleaners, use in electronics manufacturing. We are looking at and exploring [environmental, social, and governance] (ESG) for electronics and how IPC, with its standards, education, and advocacy, can be doing more for the industry to enable not only compliance with ESG, but really getting out ahead of it, right? Staying on that front foot, to be ahead of requirements and continue to build electronics better, regardless of what the policies may be. So I think again, I'm a real fan of the position I'm in at IPC to possibly do really cool big things.

LLB: Indeed. Well, as Director of EHS policy and research, I suspect you are involved in a surprising number of TSCA implementation issues. When you began your position in early 2019, did you expect this TSCA immersion when you assumed the position? Or did this come as a bit of a surprise?

KS: Yes, surprise. It was a surprise. You say this word. I can say it wasn't the big surprise where you're so surprised you catch your breath. It wasn't *that* big of a surprise. Prior to my role at IPC, I worked with the emerging chemicals team at DOD, so we were actively monitoring chemical policies and their potential impact on defense-critical operations. If there's a new regulation, wherever it may be in the world, in particular in the United States or Europe, that could impact the purchase, use, or disposal of a chemical that has defense-critical criticality, what would that mean?

I was coming from that into IPC, and because of that, I already had a lexicon around emerging regulations, evolving regulations, chemicals, and some of them that are used in bizarre places for bizarre things, right? Right. That's a surprise.

I had TSCA in my lexicon, and I knew on my first day at IPC that TSCA would be kind of up for consideration as I worked with industry members to figure out what would be the scope of my environmental policy portfolio for them, so you knew it. It was on the table. It was in the buffet. But would we take it? And how much of it would we take? Little did I realize the depth and breadth of TSCA and the need for immersion into those steps. And I think you would say, too, that, with some level of certainty, I'm not alone in that realization that TSCA is significant -- and not just in the United States, but also beyond our continental borders -- and that it's not just even the risk evaluation for existing chemicals under TSCA Section 6(b). It's other portions of Section 6. It's Section 8 on various recordkeeping reporting obligations, and even possibly TSCA Section 4 on industry testing requirements. It's a lot. It is a weighty, big thing, so as that unfolds, I'm -- yes, I'm constantly surprised that it is as significant as it really is.

LLB: I tell you, we could have a separate podcast just on the Section 8 implications, the Section 4 implications. But our focus now on this, Section 6(h) implications, where our paths crossed, I think probably most recently, Kelly, in connection with EPA's implementation of [Section] 6(h), which meant on January 6, about a year ago, 2021, EPA issued a final rule regulating five PBT [persistent, bioaccumulative, and toxic] chemicals, including [phenol, isopropylated phosphate (3:1)] (PIP (3:1). Can you tell us how PIP (3:1) is used in electrical and electronic equipment?

KS: Yes. Right, so PBT chemicals, Section 6(h), a little bit of an odd bird in the backs of TSCA. That adds to the drama around PIP, as well as the other PBTs, as well as TSCA. The basic answer is PIP (3:1): We're still learning where this multifunctional chemical is used. It has this ability to impart flame retardancy benefits, plasticizer benefits, so it has this utility. Therefore, it's used in a lot of places, including when you're talking about electronics, it can be used in those plasticky insulation covers or covers and sleeves that are on your internal and external cables and wiring. And we, right here doing this podcast, and all of our listeners out there, if they just take a moment and look around, you'll probably find a wire or a cable, or you can imagine what it looks like inside the device in front of you. They're everywhere. And this includes wiring harnesses, as well as the cables that might be power cables, [high-definition multimedia interface] HDMI cables, [universal serial bus] USB cables.

It can also be used in the components that are used in conjunction with semiconductors. So now we're going inside the guts of the electronics. It can be in the adhesives and sealants that are used to encapsulate capacitors, again, these things that are on the printed circuit board that make it work, that make your electronics work. These guts of the electronics, it could be used there, and then those guts, the problem is, those guts of the electronics are used elsewhere, right? They're used in these finished goods, and those finished goods are -- there's a lot of them! They can be fun things, like projectors, but they could also be more serious things, like professional monitoring and control equipment, electronic microscopes, radiation detection equipment, serious stuff that you need to function. And when you look at that radiation detection equipment, you don't say, "Oh, there's the PIP (3:1)! Oh, there's a bioaccumulative, toxic, persistent chemical in there." You don't see that. And if anything, you see the benefit of that detection equipment, not necessarily what it's made from. I've been trying to present and *be* present for industry to provide useful information about the [Section] 6(h) risk management rule, about PIP (3:1) and its uses, and trying to gather

information from as many sources as possible about that. And I'm so grateful to be working with other people to do that. We have peer associations that enable that. And that's where again, Lynn, I'm so glad to have crossed paths with you and others even who are in this space trying to bring awareness to these chemicals, for uses of these chemicals, as well as the broader conversation around TSCA. We are for sure still learning and still trying to bring awareness to this conversation around PIP and TSCA.

LLB: You've done an excellent job of helping our listeners understand the ubiquity of PIP (3:1) and how it was definitely a sleeper issue, right?

KS: Yes.

LLB: I know IPC was certainly aware of the final rule that came out right around now, January 2021. But tell us, maybe walk us back and help us understand if it was aware of EPA's proposed rulemaking that really was issued not long after you joined IPC in July 2019. Depending upon the answer to that question, were you able to anticipate the really astonishingly broad and diverse implications of the proposed rule and what we all know now to be the epic disarray that followed issuance of the final rule this time last year?

KS: Yes. If we knew then what we know now, if we could all -- not just industry, but government, right? -- if we could go backwards. Did we all need to experience this epic disarray? Lynn, thank you for that moniker, because it really is in epic disarray. It was momentous in what we all just went through. Are we all better for it, or could we have bypassed this?

LLB: No, we have all aged, a lot.

KS: We're here now, and yes, we probably would have done things differently. But I think it's important to point out that no matter what -- whether we could go back in time or we deal with what we have -- but there are some facts that are true no matter what. PIP (3:1) was not on our radar list of chemicals of concern. It's not a REACH substance of very high concern. It was on just one declarable substance list. It's just not a widely known substance that is being tracked or otherwise discussed as a bad actor, as something we need to move away from, or even something that we even know is in our electronics -- our electronic articles, or products, or finished goods -- because it's embedded in, as this flame retardant or plasticizer. We're not working with it. It was used by somebody else, somewhere else in the supply chain. It's difficult to quickly determine its presence, so if there are no requirements to track it or to report on the presence of it and there's no *de minimis* concentration to have a benchmark to measure against, how do we know it's there? You're not required to look for it. You're not required to report on it. And then suddenly there's going to be a prohibition through this risk management rule under TSCA Section 6(h). And you go, "I'm sorry. Huh?"

LLB: Right, exactly.

KS: And so, what was I doing in 2019? Because I'm like, "Wait, what? What? Was I asleep at the wheel? Were we all? What were we doing?" The truth is we're all very busy. And that's not an excuse. It's just a "Hey, my eyes were on TSCA. You know where they were? Section 8, recordkeeping."

That's where I was. You know, where else I was? Section 6(b), because we were just starting to go through the prioritization process for the first time, looking to identify high-

priority and low-priority substances that would then go into that risk evaluation and risk management process. And that was exciting to see that. And they had 20 released -- "Hey, weigh in on these 20." Well, yes, I needed to look at that and think about which ones of these are even used in electronics manufacturing processes or in the end products. That takes a lot of effort.

Let me start talking about formaldehyde and some of these phthalates, and let me do that. That's where I was. We did not put the proper eyes on Section 6(h) for a lot of reasons, one of which mainly is, though you look at the names of the five PBTs and you say, "I don't think those are anything we need to worry about." Because they're not -- not all of them, in particular PIP (3:1), was not on the radar. We did not anticipate the implications. We did not predict this for 2021. It was an epic disarray on many different parts. We did not expect the number of volleys back and forth among and between government and industry. And wow! I can say, though, Lynn, some silver linings or kind of unexpected positives. And this is -- I'm really not being sarcastic. I sincerely mean this, but it does sound a little hokey. I admit that. But I have a much closer relationship with a lot of people, much closer relationship with other peer electronics associations and other associations.

LLB: That *is* good. Crisis brings people together. This is true. There's an upside there.

KS: Yes, closer relationship with several of our EPA colleagues. And that is so important to have a trusted relationship where we really are -- both sides of that -- not looking to do anything other than our jobs, protect health and the environment, protect industry, and sustainably continue to make things with no or reduced impacts to human health and the environment. We can do that.

LLB: It's nice to have that positive outcome, and you've done a great job of explaining to our listeners why PIP (3:1) was not -- and perhaps the other four PBT chemicals. They're not celebrity chemicals, right?

KS: Yes. Celebrities, right.

LLB: Formaldehyde and PFAS and many other chemicals are top of mind when it comes to entities and chemical species that we look for for enhanced chemical regulation. PIP (3:1), no. It just wasn't there. But maybe you can help our listeners understand a little bit better why in the electrical and electronic equipment community, some of the challenges that the final rule inspired are so particularly and uniquely challenging. I think it depends on listeners' understanding of the value chain and the commercial supply chain, which is, in my view -- and you can correct me if I'm wrong -- particularly complex when it comes to electronic and electrical equipment.

KS: Yes. So let me take a stab at that, and I'll welcome you to come back to me if I didn't cover this the way you're thinking, maybe, or what you had in mind. This is how I approach that. Electronics -- to me, electronics are unique. They are a horizontal and a vertical. Horizontally, if you think about everything in your house, in your workspace, everywhere you go, electronics are there. They contain printed circuit boards, passive and active components, cables, wires that have been assembled onto those printed circuit boards and then incorporated into that finished product. And those finished products are -- you can think about them, at least I try to think of them, in bins -- like, you have your consumer electronics, commercial electronics, and high-reliability electronics applications. Electronics are everywhere, right?

And IPC represents -- their members represent a lot of that space. We have consumer commercial and high-reliability companies. You have these OEMs, these original equipment manufacturers, that are making medical equipment and automobiles, but also aerospace and defense equipment that is very -- again, high performance, high reliability. In the commercial space, you have folks who are making tractors, and bulldozers, and even in the consumer space, you think about your consumer electronics. But boy, there's an awful lot in that space, from the headset I'm wearing now, the phone in our hand, the laptop on the desk. It is a lot of stuff. And that is tough. Electronics are everywhere. They are complex products created by global, multilayered supply chains. It's messy. And to regulate them, to regulate, find a one-size-fits-all or a policy that fits equally across that complexity is -- it's really -- it's not that it's impossible; it's just not logical. You need to have a fit for what you're making, whether it's consumer, commercial, high-reliability -- whether it's for the printed circuit boards that go into all of those applications or really that finished product. What is it that you want to prevent harm associated with? Where is that? And how can we dissect that and be more logical? And so, the electronics industry is very familiar with regulatory obligations. My goodness, especially chemical and product policies like RoHS, restriction of hazardous substances in electrical and electronic equipment. An EU regulation that really came into force 2003, 2004, 2005, 2006 timeframe.

And then REACH, right? REACH and RoHS both now have various iterations, not just in the EU, but globally. And our global electronics manufacturing supply chain members have been adhering to and complying with RoHS and REACH for 20 years, so they're familiar with those regulations. They're familiar with the process that they follow, the decision-making process, the implementation timeframe, the restrictions and prohibitions and what that means, *de minimis*, how to engage with the government. They've been navigating this for a long time. Regulatory compliance, it's not new. But here comes TSCA, and it doesn't exactly fit with the conversation we've already been having of RoHS and REACH. It's not just another chemical to prohibit. It's a new way. It's a new conversation. And it is, in the case of PIP (3:1), a new chemical that wasn't necessarily, again, as you're saying, it wasn't a celebrity. I think that that's what makes things unique and challenging. No, no. What do you think?

LLB: I think, as we've talked offline, this was the perfect storm. You were dealing with a very low profile chemical substance that, face it, most people have never heard of. Now, of course, it's foremost in our minds. And you're also dealing with -- as a consequence of the 2016 amendments to TSCA -- new cohorts, new aspects of regulation pertinent to newcomers to the regulatory community.

Now it's not the case that your members are not regulated. Quite the contrary, you've done a masterful job of identifying RoHS and REACH and other TSCA obligations. But I think the kicker here was EPA's interpretation of the term "article" and how it was expressly -- articles that heretofore had been exempted from TSCA regulation have been brought back in as a result of this PBT rule -- so it truly was the perfect storm. And I know, to EPA's infinite credit, it *believes* it bent over backward to communicate to the regulated community that this PBT rule was coming, but if you're not attuned to TSCA regulation, you wouldn't necessarily be looking for regulatory initiatives pertinent to articles if you're not part of that cohort.

It really is an extraordinary circumstance that happened last year, and I love when you began your remarks, you use the "drama" term. This really is -- it has all the makings of an HBO six-part series. I can think of a handful of people that would want to watch such a series, but I am one of them because seldom in my legal career has there been such chaos;

disarray; anxiety; uncertainty; late night, early morning phone calls because of the impact; the global impact; this one TSCA rule that cut to the heart of your business functionality as Director of EHS policy and research at IPC. I could only imagine where you were at this time last year in managing the fallout from this thing.

KS: Yes.

LLB: Probably don't want to go there, huh?

KS: It's interesting you say that because it's been a slow evolution. I think for some others, it was definitely more sudden and hot. So hot stove -- don't touch! Oh, my goodness. Wow! And IPC members? Not as hot, but a slow warming and a slower realization. And I think that's important to understand that it isn't one size fits all, that there is different -- I don't know if this is a consequence or related to the complexity of the products and the complexity of the supply chain or what. I don't know. I don't know if we'll ever understand it, but the realization of, again, that depth and breadth and the amount of activity going on with TSCA. It's still being realized. And that [Section] 6(h) sped it up for many, but we're still not necessarily all up to speed on all of the consequences.

And the other fun thing that happened in the last 12 months is that we had a change in administration and a change in point of view of how we see TSCA, how we use TSCA to protect human health and the environment, and to really look at those chemicals and protect people from them, when necessary, at the right times. So that -- I was busy with other stuff a year ago, and it was really in maybe March that my hair was on fire. But it was a slow burn, and I can't say that was the case for everyone else. There were some others where it was definitely an immediate conflagration of "on fire."

LLB: Yes, right. For some, it was, "What's TSCA?" You were well aware of that. It did, yes. My sense is that the electronic and electronics equipment industry is exceedingly diverse, and I'm sure there were gradations of surprise and anxiety, you suggest.

KS: Yes, gradations. Yes. And that's I think part of this experience in trying to navigate it is -- coming, meeting people where they are and not assuming they really understand or know. So how do you -- you've got a deadline for a prohibition, and yet people are like, "I'm sorry. Who? What? Huh?"

LLB: Right. And those were hard stops, right? It wasn't like there was a phase-in period. It was no, March 8, 2021, was a hard stop, but for the No Action Assurance that was issued by EPA Office of Enforcement and Compliance Assurance. It was much appreciated, and of course, those deadlines are continuing to be tinkered with, and the rule itself. EPA expects to issue another proposal revamping the PBT rules in 2023. But there's a lot of confusion that still resonates throughout the supply chain with regard to these PBT rules, which is only one TSCA rule that *you* need to focus on, and the whole article issue. But I'm guessing there are other important TSCA issues that are front and center. The PFAS reporting rule is another rule that I would imagine has been an important development in your community. What are the issues that are important that you guys are looking at?

KS: You said it. Yes. If we just stay focused on TSCA, right? It really is understanding the power of TSCA and what it means to all industry, but in particular electronics, especially, as I had just gone on about, the horizontal and vertical nature. It's just we're everywhere. So yes, what does that mean? What does that mean for us? The risk evaluation and risk management activities and the prioritization of chemicals, the manufacturer-requested risk

evaluations, keeping track of that and understanding the essential chemicals or the essential substances necessary for electronics, and being able to bring information together on those essential uses, and bringing that information together, not just for industry's awareness, but also being able to communicate to policymakers. That is really one of our highest priorities.

Second to that would be what *are* your obligations for recordkeeping and reporting under TSCA Section 8? What do we already need to be doing? What can we be doing better, especially as the ability to record-keep and report is changing? And it's changing really because of electronics, which is rather meta, but it's -- this digitization, this ability to communicate information faster than ever, with more accuracy than ever -- what does that mean? And what *can* we communicate, and how? I'd like to say the time is now to be addressing this. It's not just the Section 6(h) PBTs. It's all the existing chemicals, and risk evaluations, and risk management. It's recordkeeping and reporting. And then even looking at how TSCA Section 4, on data requirements, how that may evolve or how that could be useful to EPA and what that means to industry. Because as you had mentioned earlier, articles -- it's not just about chemicals -- it's chemicals and articles. What obligations would an article manufacturer have? What do they even -- what *can* they know about the chemicals and materials in their article that would be useful to EPA? They're not the chemical manufacturer or the formulator. They're getting a product, and they have *no* obligation in the safety data sheet or any other communication document, unless it's been prescribed in some sort of contractual obligation. If there's really no obligation to know what's inside that thing in your hand -- and that's tricky. I don't know. I don't want to ramble, but I think here's where I'd focus.

The time is now. The time is now that we need to understand not just the PBT rules, but beyond that to other substances regulated, or *to be* regulated, by EPA, including something like PFAS, which in its own is a beast and a new thing to tackle, because it's a collection of really complicated chemistries that are ubiquitous. I want to stress these terms "data architecture" and "systems integration." The time is now to improve the ability to house data and information using architecture. That can mean a better laptop on the person's desk, but really, a way of communicating within your company, across different silos, across your supply chain, about the information necessary to that product; and systems integration is bringing together the ability to communicate with accuracy and reliability. Data architecture and systems integration [are] needed now, and not just to meet your TSCA obligations, but this goes beyond. This goes to ESG.

LLB: Oh yes. This is so much bigger than TSCA. Right.

KS: It's *so* much bigger than TSCA. If you achieve these improvements to data architecture and systems integration, you're doing yourself a service, right? You are positioning yourself to do so much more. I think 2021, there was a tipping point, or as I call it, the "PIP-ing point." This little chemical -- although I don't know how little it is -- but this non-celebrity chemical substance -- has caused us to realize it is paramount that you take action as a government person, as an industry person, as wherever you are as a stakeholder, to understand what you use, why you use it, and be able to talk to that with your supply chain, with your regulators, with your customers, with your -- the customers being sometimes the general public. I'm excited to be at this PIP-ing point, where you are moving in a new place. You are inspired by this realization and now need to do something.

This need to do something is where, really, I'm going into the new year, just excited. There are these opportunities to work together with industry policymakers, others, to be creative. That opportunity is exciting. One of the things that IPC is doing -- it's a major focal point at

IPC -- is called the Factory of the Future. This is not necessarily unique to IPC or even electronics, but it *is* a way to enable new products, processes, materials, to recognize those connections, and interconnections, and interdependencies when you're making things. The Factory of the Future isn't necessarily *in* the future. It is *now*, but it's a way I see to really embrace those technologies and economies of scale and also environment. As we accelerate toward a Factory of the Future, toward all Factories of the Future, we can also accelerate toward these environmental goals. It's mutualistic and even, I think, symbiotic.

It's important to recognize it takes an ecosystem to make an electronic thing function. It also is an ecosystem of manufacturing processes to make that thing. There's an ecosystem which is the supply chain. And again, that interconnectedness and interdependencies can be optimized. We could be making new products, processes, and materials. So as all of that is happening, you can be achieving economic goals, environmental goals, social goals, better corporate governance. As you're improving those processes, products, and materials -- and we see that is happening not just through Factory of the Future activities, but also through policy, the digital product passport. It's really happening. This is a policy activity that is born from the Sustainable Products Initiative, which is part of the Circular Economy Action Plan. It's all very much EU-centered, but of course, it has ramifications and tentacles to all things that are being made. That requirement for a digital product passport and what it contains is an opportunity for us to be doing things better.

Then even looking at other types of policies, to me, a policy is an instrument of change, so it could be a regulation, it could be a standard. And again, IPC is a Standards Development Organization. We have standards, existing or as you started with, Lynn, at the beginning, where else can we go with our standards to enable that connectivity and that communication of information with reliability for whatever you may need, whether it's to know the chemical content of what you use, to find safer alternatives, etc.? But how can we do that to build electronics better? I'm just, again, I'm enthusiastic about this instead of being, "Oh my gosh, TSCA! Oh my gosh, the sky is falling." It's, "Wow! This is a kind of once in a lifetime, once in a career opportunity for so many of us to bring a fresh perspective."

LLB: Oh, I just love your optimism, Dr. Scanlon -- really, because --this is why I love you. You just bring so much to the equation. And your thoughts on the interconnectivity of everything in the electronics community can be writ large, right? -- for many sectors of the economy. To see the upside here and to see the opportunity and the promise here of making better products across the board is just really inspiring.

KS: Let's keep that energy. And let's -- yes, thank you for that, and I want to capitalize on that, and that's hard. It's hard to keep the enthusiasm and to keep the optimism, and so I want to keep working with people who feed on that and see that opportunity and are excited to embrace it.

LLB: You correctly noted in some of your earlier remarks about how your background -- you worked at DOD, you just have an extraordinary background -- so I think your network is probably extraordinary and very, very rich. But given the nature of the beast here, have you developed different pathways with EPA leadership to identify opportunities to enhance stakeholder awareness of some of these very nuanced ways -- TSCA can be new to some people and new to some cohorts of the economy -- and maybe help each other to be more transparent, more robust in understanding ahead of time how a TSCA rule might really have an extraordinary impact in ways that people, perhaps including EPA, may not have anticipated? Any lessons learned there?

KS: Not yet. I am going to be sure to replay this podcast to keep me inspired and to use what you just said, Lynn, to really -- to do exactly what you just said. We have so many more opportunities to collaborate, and find solutions, and seek solutions together. And I want to engage with policymakers and others, only when I'm prepared. To be prepared, I need evidence and information from -- I guess this is my science background speaking!

LLB: Your science and your policy background, right.

KS: I don't want to go forward until I have that, and I have to get that from others. I can't manufacture that on my own. There is a little bit of an urgency, but also a measured -- I can't go yet in front of them until I have that information. I'd like to say that in the last year, again, this is one of the bizarre silver linings of PIP. What is part of the PIP-ing point is we brought the best information we could. It was limited, and it was not -- it wasn't everything we really would have loved to be able to get, but we didn't have anything more.

But we brought what we had with a sense of just frankness, right? "This is what we know." We brought that to EPA during their many rulemakings and conversations around PIP in the last year. That enabled a level of trust, I think, that I didn't see coming. I didn't do it in order to build trust. I did it to communicate and advocate for industry. And then you saw, "Wow, they appreciated it and could say back to us, 'Thank you for doing what you did in the way you did it.'" And that's what I want to keep doing. I want to bring -- we're not looking to waste anybody's time, including our own. Let's work efficiently to -- or *try* to -- be efficient at getting information together that we then can be using in our industry to do things better and to inform and work with policy makers to do that better, too, only going forward when you have that information. That's tricky. The tricky part is how do you get that information? How do you do that, especially when there's tumult? There's a lot of reasons. That's a few of your other podcasts you've done on All Things Chemical about why this is hard.

LLB: Those are great thoughts, Kelly, just great recommendations, and very inspiring terms for everybody who is listening to this podcast, to take these challenges and optimize them and do better, be more efficient, and to make our products and our offerings better, more sustainable, more circular, and just make the world a better place, right?

KS: We can -- yes, we should try. We should try.

LLB: Dr. Scanlon, this has been a fascinating conversation. If listeners wish to learn more about you, IPC, and many of the thoughts that you have articulated on this podcast, where would they look?

KS: Yes. IPC.org. We have a robust website that would get you started in the best of ways, so checking out a website, a lot of fun. We have great information on our standards and our education, as well as our advocacy activities, but we're also pretty prolific in the space of blogs, newsletters, and social media. You can follow us on all your social media platforms. You can follow us on our blog. You can follow our newsletters, and you do not have to be a member to do that. Membership has its privileges, but you do not have to be a member to get that type of information. We always welcome folks to check that out and sign up for that information and get it in their inboxes or on their phones, wherever it may be that they like to engage with that information.

LLB: Excellent. That's IPC.org, right?

KS: Yes.

LLB: Well, Dr. Scanlon, thank you again for joining us today. Really appreciate your passion, how articulate you are in identifying ways that we can work together, and for sharing your thoughts and your observations on a complex world with our listeners. Thank you so much.

KS: Thank you.

LLB: My thanks again to Dr. Scanlon for speaking with me today about the important work IPC does and the ways the electronics industry addresses these challenges in the context of a very unpredictable and challenging commercial backdrop.

All Things Chemical is produced by Jackson Bierfeldt of Bierfeldt Audio LLC.