

Careers in Green Chemistry and Sustainable Design

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[00:00:00] I work for HP Inc. and my title is Global Lead of Sustainable Materials Innovation. And I've been working in sustainability and green chemistry for about 10 years. My favorite part of my current role is I get to investigate new materials and um, what this means is like, you know, we make our products and our packaging out of materials we've used for a long time, so, you know, products can be a lot of plastics and metals, and for packaging, it's like paper and plastics.

[00:00:44] So with the new materials, we're looking at alternative materials that could be incorporated into our products and packaging that have less impact from an environmental perspective and social perspective.

What is a circular economy?

[00:01:01] So the circular economy is really where, um, we're trying to make the whole system more circular, more of a loop. So if you think about when you're making products, you want to incorporate more recycled materials, or even reused parts into those products. And then, when the product's in use, you know, the customer's using it, and hopefully, you know, it lasts as long as they need, and it's repairable.

[00:01:25] And then, when the customer's done with it, then, we don't want to just recycle that product, you know, which might have happened in the past. We want to reuse it if possible. So that's kind of the first step, is to see if that product can be reused. And it might need some light repair, or what we call refurbishment.

[00:01:43] And then really, if we're at the point where it can't be reused, then it would be recycled. And then those materials could feed back into the new product. So it's kind of this whole loop.

What does sustainability mean to you?

[00:01:59] As my knowledge of sustainability has evolved, it really means trying to reduce impacts as much as possible, um, when we're making products. Um, cause people are going to want to continue to have, you know, their phones

and their PCs and printers and, you know, it's really the responsibility of companies to figure out how to make those products more sustainable.

[00:02:25] Consumers play a part where they, you know, should demand of companies that you should make products that we feel good about using. But I think it's really up to the companies to try to figure out how to, um, continue to make products that are reducing our impacts from the environmental and social perspective, and maximizing the materials and products being used, you know, keep on using them at their highest value that is possible. You know, from the circularity perspective, there are finite resources, you know, like we will run out of some of these materials in the future if changes aren't made to recycle them more and, or even reduce the usage of certain materials.

How does sustainability benefit a business's profitability?

[00:03:15] What we found is that because there are many customers asking for sustainable products, um, we can often make the case that we, if we incorporate recycled materials or, um, you know, make things more sustainable from the packaging perspective, um, even though it might cost more sometimes, we can justify it because of the increased sales like to customers.

[00:03:39] Part of what my team does is we're trying to innovate to develop solutions that help us achieve our sustainability goals without adding a lot of extra cost. And when there's new materials especially, and that's a lot of what I'm working on, at first the costs might be higher, but then as, um, more and more companies, you know, that supply those materials, have those available, and as companies start demanding them more, then it scales up and the costs come down. So that's part of what we try to, um, look at is like, you know, try to predict a bit like, okay, if we could scale this up, then we could get to a point where it doesn't cost as much.

What do you consider to determine if a material is sustainable?

[00:04:24] So when we're evaluating new materials, there's a lot of different aspects to look at to make sure they're sustainable. We use a tool called Life Cycle Analysis where we're looking at all the impacts of materials from when they're, you know, extracted from the earth to manufacturing use phase and then end of life.

[00:04:43] And some of those things they're looking at are carbon footprint, you know, water usage, and there's also like chemical usage considered in that. And then there's also the social considerations. So like if you're sourcing a material,

you know, if it's coming from a mining operation, you know, is, are those workers in a safe, you know, under safe working conditions. And then there's like through the whole manufacturing phase, you know, are those workers and our manufacturing facilities, do they have a good living wage? Do they have, um rights as far as not being exposed to toxic chemicals, you know, that kind of thing. And then the use phase, you want to think about, you know, is there anything, um, with the, the product itself?

[00:05:29] And then, um, the end of life, you know, can you recycle those materials as part of the consideration? Um, if you can't recycle it, then it's maybe not that sustainable.

What was your pathway to working in sustainable design?

[00:05:45] So my background is science, so I was a physics major, um, and then became a reliability engineer. So I worked to help test products, um, inkjet printers, and make sure they were going to work well for customers and didn't have any major issues. Um, so I did that for a long time and then was interested in getting-- I got involved in sustainability just from my own, kind of what I'm passionate about.

[00:06:10] We had a sustainability club on site that I took over leadership of that. And so through that, I was kind of like wanting to change what I was working on. And so I started looking for jobs in the sustainability area. It actually took like two years. So you have to be patient sometimes if you want to change something in your career, you know, it's not going to usually happen overnight.

[00:06:31] So that was about 10 years ago. And I've actually, you know, changed organizations, changed managers, changed responsibilities, but never applied for a new job since then, so it's evolved within that job, um, where, you know, I have always managed programs related to sustainable materials in my role, but it was a lot of regulation based work back then.

[00:06:53] And then it just evolved over time where I moved more and more into leadership work. And that was really partly because of my desire to do something different. And so as we hired some new employees and I passed on some work to them and, um, moved into more of the leadership work and, um, helping set goals and manage those goals and then working with external organizations as well.

What is an example of using biobased feedstocks?

[00:07:24] If you think about mushrooms, if you see mushrooms growing in a forest, a lot of what people don't know is their root matrix is really large underneath any mushroom patches you see, and it's often connected underneath the ground. And so it's called mycelium, and it's um, something that we're working with companies that develop foam that can replace like EPS, which is expanded polystyrene foam.

[00:07:51] You know, if you think of styrofoam, um, it can replace that for packaging so it can protect products just like styrofoam does. Like they could take wood chips or, um, any kind of like plant based fibers and they grow this root matrix onto that. And they basically have a mold they can grow it into. Then, you know, they kind of stop the growth.

[00:08:14] They heat it up enough to stop the growth. And then that can be used as a cushioning material. So it's really cool because it's, um, very sustainable. These are totally biodegradable.

What advice do you have for students as they consider what to do after high school?

[00:08:31] One of the things that's hard to figure out as a young person is like, what am I going to do to, you know, earn a living and potentially go to school and all that. And I think it's like, you know, figure out something you're passionate about that you're interested in that can hopefully, you know, pay, that you can get a job in.

[00:08:52] Um, but I think the important thing is, is learning from the people, you know, whether it's teachers or coworkers and from the experiences you have along the way that, you know, being open minded to learn things from people and from those experiences you have because then that can help you evolve in your understanding of the world and what you want to do and of yourself, right?