



## Executive Insights

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# Roundtable Sustainability Series: The Chemicals Industry

We recently held an in-depth conversation about sustainability's impact on the chemicals industry with leaders in L.E.K. Consulting's Chemicals practice: **Carol Wingard**, Managing Director and Global Co-Head of the firm's Industrials sector; **Amanda Davis Winters**, Managing Director; and **Morgan Haronian**, Senior Engagement Manager. Excerpts from our wide-ranging discussion can be found below.

**The chemicals industry is huge — how is it possible to understand the scope of its impact on sustainability?**

**Carol Wingard:** The topic of sustainability in the chemicals industry is almost as vast as the chemicals industry itself, which is \$800 billion in the U.S. and \$6 trillion globally. Chemicals go into almost everything. In addition, innovations in the chemicals industry often lead the way when it comes to downstream industries and end markets.

It's sometimes helpful to think of the chemicals industry in terms of categories. One might be materials that are processed from oil and gas — petrochemicals. Some of those same products can also be produced from other organic sources, such as feedstocks, animal fat, palm oil, corn oil, sugar, etc. And then there are a lot of inorganic chemicals.

**What is the industry doing about sustainability?**

**Carol:** Sustainability-oriented efforts in chemicals are numerous and varied. Most chemicals suppliers have embraced waste reduction as one way to approach sustainability.

You can reduce the volume of product used by creating a better product that might be slightly more premium in some cases. You can create closed-loop systems that reuse chemicals within a factory. You're not adding chemical volume; you're recycling.

Another effort involves natural or "green" chemicals, which is part of a drive to reduce petrochemicals by using bio-based sources such as sugar or cornstarch instead. That is often done to meet consumer demand for natural ingredients in categories such as food and beauty and personal care products.

**Morgan Haronian:** Another effort is improving chemical manufacturing — lowering water use, for instance, to make the manufacturing process less environmentally impactful. Part of this is to decrease effluent and air emissions as chemicals are made.

And there's the overall effort to reduce carbon by using other products with a smaller environmental footprint.

**Are those the major efforts?**

**Amanda Davis Winters:** Those are just some of them. Chemicals serve other sectors where sustainability is key. Take [packaging](#), where waste and virgin plastic are two critical issues. The chemicals industry is helping to address plastic waste through a

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*Roundtable Sustainability Series: The Chemicals Industry* was based on a conversation with **Carol Wingard** and **Amanda Davis Winters**, Managing Directors, and **Morgan Haronian**, Senior Engagement Manager.

Carol is based in Boston, and Amanda and Morgan are based in New York.

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process called chemical recycling — essentially, breaking down the plastics into the component resins that can be reused, which is actually different from just throwing stuff into the existing municipal recycling system.

And then there are efforts to simply reduce the amount of waste. These involve the treatment and detoxification of chemicals — things like water treatment and filtration and the use of additives to improve processes.

## How long has the environmental impact of the chemicals industry been an issue?

**Carol:** Interestingly, before the 1950s, most products were made out of natural feedstocks, not out of petroleum. It's kind of amazing.

So, it's fairly recently that all this carbon-based material has become embedded in our environment. We have to figure out a way to reduce it. We have several options: do without, reduce the inputs that we need to make something, find an alternate way to make something or find an alternative to the product.

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— Carol Wingard

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All of those things are going on, to a degree. But it's such a huge industry. How do consumers unwind from, say, plastics being just such a huge part of our lives? Things like not using straws and using paper bags instead of plastic bags — that's all good, absolutely, because it raises consciousness, and it actually does something environmentally good. But that is just such a tiny tip of the iceberg. Not using a plastic straw is not going to cure things.

**Given that plastics and other chemical products are basic to so many products, the sustainability impact of the chemicals industry on other industries must be enormous.**

**Carol:** As I alluded to before, the chemicals industry is responding to and driving technological change that improves other industries. It enables them to reduce waste and to increase sustainability. We've already hit on packaging.

And there's the automobile industry. You think about the electric vehicle as a critical component of sustainability. Well,

battery technology is something chemical companies provide. So is weight reduction in cars, which lowers CO2 emissions and improves fuel economy. Lightweighting is directly derived from new materials created by the chemicals industry.

The chemicals industry is creating new materials that can help drive sustainability more broadly in society. And the industry hopes it will make a bit of money in the process.

## What motivates the chemicals industry toward sustainability? How much of it is consumer pressure?

**Morgan:** There is definitely an element of consumer or societal pressure on the chemicals industry. For example, the concern over the use of plastics in packaging pushes on chemical companies to figure out a solution. Plastic packaging, recycling, figuring out a solution to all the straws in the ocean or the mounds of plastic waste — it is ultimately the chemicals industry's responsibility, in part.

Another example: the green chemicals trend. The idea is, you're making a particular chemical from, say, petroleum. But the consumer is looking for natural ingredients, and there are a lot of beauty and personal care companies that are staking their fame and fortune on being all-natural. If you are a major supplier to that industry, you have to come up with a surfactant or a fatty acid that can be deemed not petroleum-based. And so, you figure out how to make that product out of one of the other feedstocks. Some companies use animal fat, but if it's for beauty and personal care, it's often plant-based. So, you take sugar and soy or palm oil and create a different process to make the same or a similar chemical product. That is just one way to make a more sustainable product, although at other times sustainability can measure a given product's carbon footprint.

**Amanda:** And there are bioplastics. PLA (polylactic acid) and PHA (polyhydroxyalkanoates) are two examples of plastics substitutes derived from plant-based material. Cargill-owned NatureWorks is a key player in this market, and a few others have developed a plant-based alternative to plastic packaging products.

A great deal of innovation in the chemicals industry involves figuring out how to meet that consumer demand. Why? Well, those kinds of innovative and more sustainable products can command very good pricing.

So, consumers and customers are driving the demand for a different kind of product.

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## Who's in the lead? Is it the big chemical companies, or is it smaller companies that get big-company investments or licenses?

**Carol:** Both. Ten or 15 years ago, a lot of the innovation was happening in startups or smaller companies. They have subsequently gotten investments or been bought by larger chemical concerns. But now, many of the more traditional chemical companies are also going this route — that is, pursuing innovation on the sustainable, specialty front.

Dow and DuPont, two of the biggest chemical companies in the world, recently merged. And then they split into three different companies. Dow got the commodity chemicals, and DuPont got the specialty chemicals. Then they created a third company, Covestro, to handle the agricultural chemicals from both of those firms. You see in the market a splitting between those that have good volume production and those that are more specialty-based, and that's where sustainable innovations may take place.

## Is there a business case for unsustainable chemicals?

**Morgan:** There is always tension between natural, or green, chemicals and those that are made from petrochemicals. One reason is pricing. Often, we have very cheap oil and gas, especially gas here in the U.S. these days. Products can be made from natural gas pretty cheaply. Making them from other feedstocks can be challenging, and the processes aren't as developed. It costs a fair bit to scale up. There is a capital and a price issue there.

And there's also an issue around being able to easily replace that petrochemical-based product with something that is chemically similar. The work has been going on for a couple of decades. But it's still not an easy path forward.

## Does the chemicals industry feel investor pressure to improve sustainability?

**Carol:** Certainly, we have a vibrant media in this country, and they're going to cover negative stories. And when these stories happen, it affects stock prices. Also, investors are evaluating how they consider different sectors, with some taking quite a binary "inclusion/exclusion" approach, which can make a number of investor classes cautious about the industry. They want to invest in sustainable companies, ones that really have the highest standards of safety and environmental stewardship.

Also, something that motivates companies to implement sustainable practices is that it might make them more attractive to a broader range of potential investors. It's a way that they can differentiate themselves and increase their value. So, sustainability is partly consumer-driven, but it's also a way to differentiate

from the other technologies on the market. And being more sustainable can sometimes drive cost reduction. If you're thinking of improving chemical manufacturing processes and reducing your water usage, implementing sustainable practices might actually be a means to increase the efficiency of your processes. You can equate being more sustainable with finding ways to minimize cost, increase your performance and enhance the value of your product. The cleaner your product, maybe the better it performs, and you can derive value from that. That and other factors, like the potential for price premium, brand benefits and risk management, appeal to investors.

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— Morgan Haronian

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## Are there any kind of innovations or developments in this area that are really striking?

**Amanda:** It's more of a gradual evolution. It's less about just producing a lot of stuff and more about making specialized products for what the customer wants. And this is why the whole specialty chemicals segment of the market is growing considerably faster than bulk chemicals. Also, the stock prices of these specialty companies and their trading multiples are much higher.

It's interesting to look at any application where additional ingredients are included in the mix that reduce the amount a customer needs to use. Why would a chemical company want to do that? Because they can sell it for more money, so they can continue to sell it as opposed to it being replaced.

The broader trend of energy transition is also impacting the chemicals space. Whether it's corporations investing in biofuels, lower-carbon fuels or electrification of cars, this is a broad theme that impacts the upstream chemicals and raw materials that feed into a range of end markets.

## What are some of the trade-offs around specialty, sustainable and other chemicals?

**Carol:** Sometimes there's tension when it comes to price, green chemistry and performance. Take the beauty and personal care space. Consumers and beauty and personal care companies, they

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want all-natural. But, on the other hand, the customer is paying \$100 for a little container of eye cream and wants performance. That eye cream will have to have some active chemical ingredients in it.

Think about bread. Did you know that a lot of bread, like Wonder Bread, that goes in the middle of the supermarket aisles actually has petrochemicals in it? It's used to prevent mold formation. No one has found an alternative to preventing moldy bread, so you have the choice of, on the one hand, the Wonder Bread in the center aisles, with chemical additives for a long shelf life, which keeps prices low, or the artisanal bread that's baked in the supermarket oven or sent to the store, that has a very limited shelf life. Again, there is this tension that suppliers and grocers have to deal with, between being all-natural in one case, and higher performance and more functionality in the other.

## **How much of sustainability innovation is customer-driven, as opposed to being driven by the chemical companies themselves?**

**Morgan:** End markets that are consumer-facing — like cosmetics, food and beverage, where consumers or society worry about what's going on their food, what's being sprayed in the environment — those are the areas in the chemicals industry that are affected by outside forces. They're the first areas where companies really strive to go green.

Ford was the leader in developing soy-based foam to go into the cars, and they were leading the way in petrochemical reduction in automotive production. When you have customers pushing companies, they adapt.

## **Some companies are announcing emissions reduction targets. DuPont has announced that it will reduce its emissions by 30% by 2030, and that 60% of the energy it consumes will come from renewable sources by 2030. There have been other such proclamations. Do these proclamations matter?**

**Carol:** I think companies think long and hard before they announce these goals. However, some companies still have a lot of work to do, even once announcements are made, to make substantive plans and then act on them. It's increasingly seen as a big part of stakeholder responsibility. The question is, as with everything that might affect climate change or resource scarcity, are we as a society doing it fast enough?

I go back to plastics. We in the U.S. are rapidly increasing our production of plastic resin. And why is that? Because we as a nation discovered how to frack gas out of rock, and there was

this massive boom in the development of oil and gas wells in Texas and elsewhere. And then, what do we do with it? Well, the simplest thing to do in many cases is to turn it into plastic resin, which we can use in the U.S. or export elsewhere.

I think that, on the one hand, there's growth in plastic resin, but on the other hand, there is an increasing need to then do something about it. This leads to the interesting work going on around the chemical recycling of plastics. There are companies working to take the plastics that are hard to recycle — multilayer or more complex, not just a simple PET (polyethylene terephthalate) — and then use other chemicals to break them down into virgin resin that can be reused. That's something significant going on in the chemicals industry to start to address the problem.

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— Amanda Davis Winters

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## **If there's a downturn in the global economy, do you think the sustainability drive might pull back a bit?**

**Amanda:** In the 2008-10 downturn, we did see consumers and companies pull away from their sustainability commitments. But it's different today. In Q2 2020, when COVID-19 was just taking off, some brands and governments did pull back on their sustainability commitments. For example, California paused its plastic bag ban temporarily given hygienic concerns. That being said, a good chunk of our population is more meaningfully invested in sustainability and slowing climate change and resource scarcity than we were 10 years ago. The younger generation is much more committed, and there is greater sustained investor pressure. If there's a temporary pullback, it would not be as great as we saw in the 2008-10 time frame.

## **Will the chemicals industry be vastly different because of sustainability priorities?**

**Carol:** I think it's a journey. It's going to be vastly different. Consumer and customer pressure will be a factor. Regulation will be a factor. These pressures already are a factor in Europe, especially in the Scandinavian countries, and it could be in China if there's a concentrated environmental push. All of those forces will work together to transform the industry.

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In terms of government impact, there are two dynamics. One is regulation. The other is incentives. And that is something where Europe has gained much more ground. Going back to plastic recycling, our municipal recycling is a disaster now. Even if you put plastics into your recycling bin, two-thirds of that still ends up in dumps. There are many factors, but one is that it's just very

cheap to dump it in a landfill. The tipping fees are too low. In the U.K., on the other hand, the landfill tax is more than 90 pounds per metric ton, making landfills the most expensive disposal option for waste. Similarly, people might say pricing on water is too low. Often, a regulation won't be effective, but a carrot, or financial incentive, will.

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## About the Authors



Carol Wingard is a Managing Director, Head of L.E.K. Consulting's Industrials sector in the Americas and Co-head of the firm's global Industrials sector. Based in Boston, Carol has

more than 25 years of strategy consulting and business development experience working with clients to develop and implement growth strategies. In addition to managing the Industrials practice, she leads the Chemicals and Industrial Equipment & Technology practices and is the former Managing Partner of L.E.K. China.



Amanda Davis Winters is a Managing Director and Partner in L.E.K. Consulting's New York office. As a member of the firm's Industrials sector, Amanda has extensive experience

in packaging, chemicals and environmental services. She has deep expertise in market entry strategy, market segment prioritization, go-to-market and commercial planning, inorganic growth strategy and both buy- and sell-side diligence.



Morgan Haronian is a Senior Engagement Manager in L.E.K. Consulting's New York office. She is part of the firm's Industrials sector, focusing on chemicals, agribusiness and

environmental services. Morgan has expertise in organic and inorganic growth strategy and both buy- and sell-side diligence.

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