

FACT CHECK ON JUDITH ENCK – BEYOND PLASTICS TESTIMONY FOR CONGRESS 2022

Author: Chris DeArmitt PhD, FIMMM, FRSC, CChem

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Phantom
Plastics

Introduction

Judith Enck describes herself as “the founder and president of Beyond Plastics, a nonprofit that aims to end plastic pollution everywhere.”

She was invited to testify before Congress although I can find no evidence to suggest that Judith Enck or her team are qualified to testify on this matter. Specifically, I do not see any professional polymer, i.e. plastic scientists listed.

<https://www.beyondplastics.org/about>

Nevertheless, let us examine the testimony and check its veracity against peer-reviewed science. My qualifications to do so are a PhD in the field with over 30 years of experience. Furthermore, I am an independent scientist who dedicated thousands of hours unpaid to read over 3000 peer-reviewed scientific articles spanning plastic materials, waste, litter, ocean plastics, microplastics, degradation and more. It is probably the broadest review on the topic and the findings are shared free of charge in The Plastics Paradox book, in online videos and on the websites plasticsparadox.com and phantomplastics.com.

Let us examine each statement and compare it to what science tells us.

Testimony

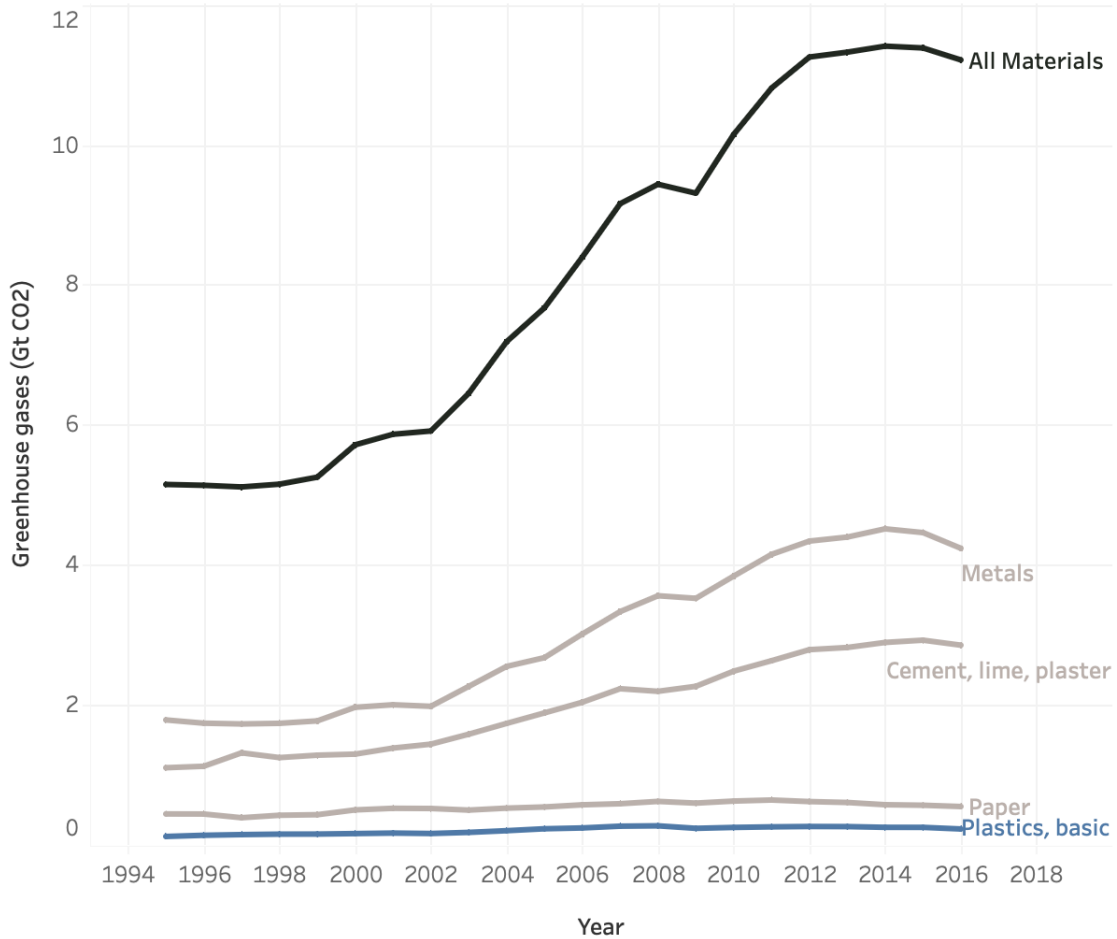
The first line of testimony reads:

“The production, use, and disposal of plastics is a vitally important issue that threatens human health, our ability to avoid the worst projected impacts of climate change, and the health of our oceans and environment.”

Is the statement accurate? It is not at all consistent with the peer-reviewed science. Scientific studies show that the plastics we use are safe and in many cases FDA approved for food contact. We eat our meals from such plastics as they are rigorously tested and shown to be benign. To their credit, they do provide some scientific citations to evidence in their report, but they do not reflect the preponderance of the evidence. They are “cherry-picked” to suit their cause.

Enck’s statement that plastics are to blame for climate change is incorrect. They provide as evidence their own report - THE NEW COAL PLASTICS & CLIMATE CHANGE Beyond Plastics | October 2021. However, the report is grossly inaccurate. In fact, plastics production creates just 0.5% of all carbon dioxide according to a detailed, peer-reviewed study.

Comparing carbondioxide emission in the production of individual materials



<https://phantomplastics.com/carbon-dioxide-created-and-saved-by-using-plastics/>

The Beyond Plastics report looks only at the carbon dioxide from the production of plastics and completely overlooks the carbon dioxide saved by the use of plastics. This invalidates their assessment as it is incomplete and therefore unprofessional. We know for a scientific fact that replacing plastic vastly increases carbon dioxide, as detailed later.

The Beyond Plastics website states:

"Plastic. Pollution. CRISIS. If we don't act now, experts say there will be more

PLASTIC than fish in the ocean by 2050. Call now to ask your members of Congress to co-sponsor the Break Free From Plastic Pollution Act."

<https://www.beyondplastics.org/actions/tag/ocean+plastic>

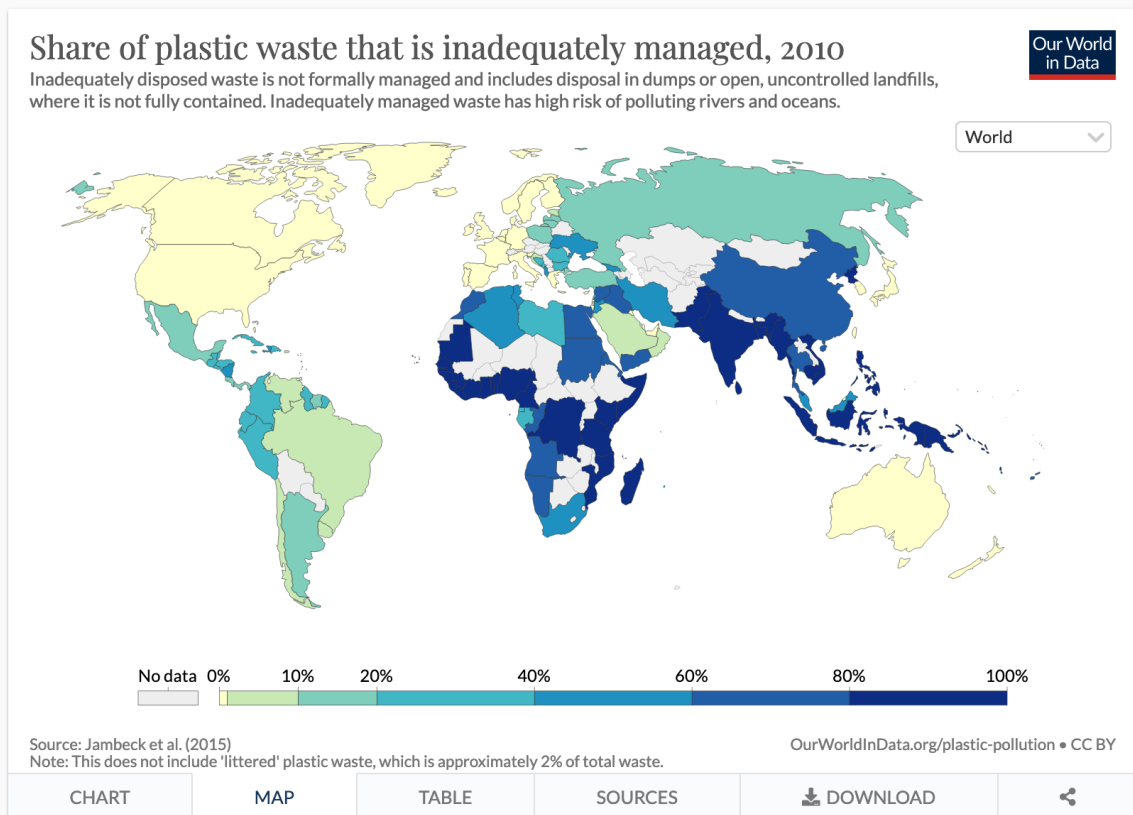
Is that accurate? In fact, the more plastic than fish by 2050 claim has been debunked, i.e. disproven several times, for example by the BBC, by the CBC and more recently by myself.

<https://phantomplastics.com/more-plastic-than-fish-in-the-ocean-by-2050-true-or-false/>

In short, the statement is fiction. Why does an organization claiming to care about the environment present disproven statements?

Next, the testimony talks about the urgent need to prevent mismanaged plastic waste from the US from entering oceans when in fact, the data shows that plastic in the oceans is mainly discarded fishing gear and that the US is not responsible for mismanaged plastic. It is known to come from 10 rivers in Asia and Africa.

Again, we find an alarming disparity between the testimony and the scientific evidence.

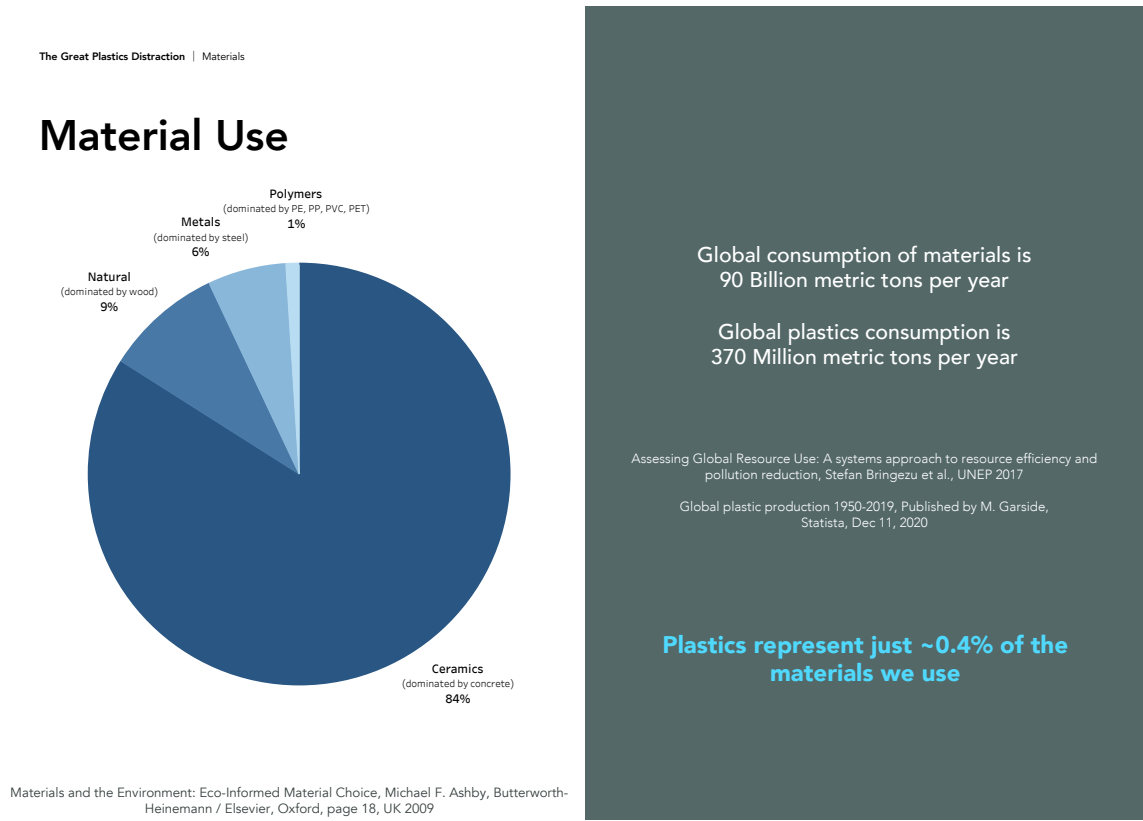


Enck then declares:

“We need major new federal legislation to significantly reduce the production, use, and disposal of plastics, and we need it now.”

Plastics make up under 0.5% by weight and under 1% by volume of the materials we use and the waste we create. That means that anyone genuinely concerned about materials consumption or waste would not be focused on plastics, they

would instead address the other >99% of materials. This implies that their true motive is anti-plastic and has nothing to do with materials production or waste.



What would happen if we were to follow Beyond Plastics' advice? Studies show that replacing every 1 pound of plastic requires 3-4 pounds of the replacement material on average. So, following Beyond Plastics' advice would mean vastly more materials use and vastly more waste. Does that sound like sage advice?

Some examples:





Bags: plastic 6 grams paper 60g
Straws: plastic 1g paper 2g metal 11g glass 22g
Bottles: plastic 30g aluminium 90g glass 325g

Next, she specifies that she is against single-use and non essential plastic items like " single-use plastic bags, straws, cups, forks, plates, gift cards, bottles, vapes and e-cigarettes, and plastics in cigarette filters."

In many cases it does make sense to reduce our consumption of goods but why target only plastic and would it be wise to eliminate single-use plastic? The scientific evidence

on that topic is clear and overwhelming. Every life cycle analysis (over 20 of them) shows that replacing single-use plastic bags with paper, cotton, or degradable plastic **massively increases harm** to the environment meaning far more energy and water used and far more carbon dioxide and waste produced. Once again, Beyond Plastics' anti-plastic obsession has led to faulty, harmful advice.

What about other single-use products other than bags? Life cycle analysis shows that replacing plastic straws increases harm (of course, to be truly green, simply take no straw at all). Life cycle analysis shows the same for other items like envelopes. Replacing plastic mailer envelopes leads to 4x more waste, water use and CO₂ and double the fossil fuel consumption.

| FORMAT | FOSSIL FUEL CONSUMPTION (MJ-EQUIV) | GHG EMISSIONS (KG-CO ₂ EQUIV) | WATER USE (l) | PRODUCT-TO-PACKAGE RATIO AND PERCENT WT. | PKG LANDFILLED (G)/1,000 KG MAILER |
|---|------------------------------------|--|-------------------|--|------------------------------------|
| POLY MAILER  | 1.49 | .06467 | 24.70 | 5.8:1 85.2%:14.8% | 166,400 |
| BUBBLE MAILER  | 2.60 (+74.0%) | .1092 (+68.9%) | 36.68 (+48.5%) | 3.4:1 77.1%:22.9% | 284,975 (+71%) |
| PAPER CUSHION  | 2.34 (+56.6%) | .3425 (+430%) | 195.68 (+692%) | 0.8:1 43.3%:56.7% | 972,807 (+485%) |
| PAPERBOARD  | 3.51 (+135%) | .4494 (+595%) | 124.56 (+404%) | 0.7:1 41.8%:58.2% | 1,034,696 (+522%) |

The next statement from Enck talks about plastic as a:

"...material that lasts for literally hundreds of years, if not longer."

Is that correct? There are thousands of scientific publications about the degradation of plastics precisely because they degrade too rapidly. In fact, plastics degrade more rapidly than most materials we use such as concrete, metals, glass and ceramics. Billions of dollars are spent every year on stabilizer additives to prevent plastics from degrading too quickly. That money would not be spent unless such stabilizers were essential. In fact, a comparison of paper and

plastic bags showed that they degrade at a similar rate. Criticizing plastics for their degradation rate is unscientific and unjust.

Once again, Beyond Plastics have repeated an internet myth. It is their responsibility to check the science and to present correct information to Congress and they have soundly failed to do so.

Next Enck perpetuates another disproven myth. She says:

“Scientists estimate that about 8 million metric tonnes of plastics enter the ocean each year. This is the equivalent of emptying a dump truck full of plastic into the ocean every minute.”

It is true that a scientist made such an estimate, but that was a long time ago and it was pure guesswork. Jambeck guessed that 2% of plastic waste within 30 miles of the coast would somehow jump into the ocean. That is where the 8 million tons estimate came from. What do newer, comprehensive studies based on actual measurements say? The most comprehensive study showed that Jambeck’s guess was wildly inaccurate. The current best estimate is over 1000 times less at just ~6000 tons per year.

<https://phantomplastics.com/more-plastic-than-fish-in-the-ocean-by-2050-true-or-false/>

Once again, we see that Enck has failed the public and failed Congress by not providing updated, accurate information.

She goes on to say:

“Since plastic doesn’t decompose, the amount of plastic pollution in the ocean is growing larger as we meet here today.”

Scientists have shown with 100% certainty that plastics do degrade, so the statement made to Congress was misleading. Furthermore, studies show that plastic in the ocean actually peaked decades ago and is decreasing, not increasing.

<https://plasticparadox.com/oceans/>

The next topic addressed is that there are plastic particles in the ocean. Of course, that is true of all materials we use. The key question is whether there is harm. This statement was made without any evidence:

“Sea turtles tend to mistake floating plastic bags for jellyfish—a favorite food—an error that often proves fatal.”

Is the statement accurate? Here is a summary of the most detailed studies on turtle mortalities. Neither plastics nor bags are significant.

The Great Plastics Distraction | Turtles

Turtles

Here are the leading causes of Loggerhead Turtle mortality:

| Source of Mortality Caused by Humans | Mortalities per Year |
|---|----------------------|
| Shrimp trawling | 5,000 – 50,000 |
| Fishery (trawl & release, passive gear, net entanglement) | 500 – 5000 |
| Collisions with boats | 50 – 500 |
| Dredging | 5 – 50 |
| Other | 20 – 200 |

National Research Council. 1990. Decline of the Sea Turtles: Causes and Prevention. Washington, DC: The National Academies Press. <https://doi.org/10.17226/1536>
Allen M. Foley et al., Characterizing Watercraft-Related Mortality of Sea Turtles in Florida, The Journal of Wildlife Management, 83 (5):1057–1072; 2019; DOI: 10.1002/jwmg.21665

Plastics are not a significant threat to turtles



Once again, we have been misinformed.

Enck then says:

“These pieces of plastic in the ocean both contain toxic materials and also act as sponges that attract and absorb toxic pollutants in the water, including pesticides and hormone-disrupting chemicals.”

It is true that plastics in the ocean absorb toxins that are in the water. What does

that mean for the fish? It means there is less toxin in the water, so the fish are protected by the plastic which soaks up the chemicals that could otherwise have harmed them. What happens when the fish swallow some plastic? Scientist have done experiments on that too and found that the toxins remain inside the plastic which passes right through the digestive system.

<https://plasticsparadox.com/microplastics/>

Again we see that Beyond Plastic are making statements that reflect a lack of rigor and understanding.

“According to researchers, 70-80% of the plastic in our ocean comes from land-based sources.”

Again, this was based on an outdated guess. The latest information shows that up to 85% actually comes from fishing vessels. It is Beyond Plastics’ business to know the facts but they have not done their due diligence. Or perhaps they persist with old invalid data because it suits their purpose?

Beyond Plastic changes topic to talk about danger to human health from plastics.

“Unlike paper products that are biogenic and break down into carbon and other elements that are recycled back into the natural ecosystem, plastics are made from fossil fuel-based carbon compounds that don’t break down.”

As already shown, the statement is false and shows a complete lack of understanding of the science. It reinforces what we have already seen, namely that this person appears unqualified to speak on this matter.

Talking about microplastics Enck says:

“In fact, a 2019 study by the World Wildlife Fund estimated that adult humans are all ingesting 50 grams—roughly a credit card’s worth—of plastic each week.”

She misquoted the WWF study. In fact, that study said that someone who drank lots of bottled water could ingest up to 5 grams (not 50 grams) of plastic per week.

More importantly, a newer, independent study revealed that the WWF sponsored

study was wrong. The new study showed that it would actually take over 20 000 years to eat a credit card's worth of plastic. That and other myths are dispelled here:

<https://phantoplastics.com/leading-independent-expert-analyses-media-coverage-with-facts-and-logic/>

Enck then says that plastics speed climate change when science shows the exact opposite. Other materials used to replace plastic create multiple times more CO₂.

She goes on to say that the plastics industry is growing at an alarming rate. In fact, plastic growth is projected to be 2-3% per year which is the same as for other common materials such as metal, wood, concrete and paper.

<https://phantoplastics.com/why-is-plastic-bad-for-the-environment-get-the-facts-in-5-minutes/>

Yet again, we see that their goal is to demonize plastics, in spite of the evidence.

When it comes to fossil fuel use they state:

“Petrochemical companies see falling demand for their products in their traditional markets for transportation and electricity generation. In response, they are increasing plastics production to make up the difference.”

In actuality, the net effect of plastics use is to decrease fossil fuel use, so the argument is invalid. If anything, the oil companies would want plastics to be eliminated. Furthermore, one cannot simply increase supply of a material at will. When supply exceeds demand, the result would be a price so low that financial losses would result.

When it comes to recycling, Enck's comment is:

“Some materials—such as paper, glass, and metal—can be effectively recycled and safely made from recycled content. The U.S.'s high paper recycling rate (68% in 2021) proves this point. But that's just not the case for plastics. The plastics recycling rate is abysmal, and the end-products made with recycled plastics are sometimes laden with toxics.”

In fact, we know that plastics can be readily recycled using the standard mechanical method (grind it up, melt and form a new part). We also know that approach is green, reducing CO₂ even further. So why are plastics not recycled more? The main reason is profitability. It is hard to make money doing it and companies that try often go out of business.

Examination of materials production reveals that more expensive materials tend to be worse for the environment. The very worst are platinum, palladium and gold. Those materials are also very expensive and for the same reasons that make them bad for the environment, namely the huge amounts of energy, CO₂, waste and pollution from their production.

Plastics are just the opposite. Over 50 life cycle studies show that plastic causes less harm than metal, glass, cotton or paper. The same factors that make plastic so green make it cheap – so cheap that it's hard to make money recovering and recycling it.

So, the low current recycling rate is not some conspiracy. It comes down to economics and the remedy is known.

Enck says:

"We cannot recycle our way out of the plastic pollution problem."

This is actually correct. Recycling rate has nothing to do with plastic pollution. Littering of plastics is caused by people, irresponsible people and has nothing to do with the materials or the recycling rate. Scientific studies reveal that over 80% of litter is dropped intentionally. Effective means to reduce litter are based on changing behaviour through education, fines and deposit schemes. The deposit makes the item too valuable to be dropped and littered.

Conclusion

The science is extensive and the conclusions are clear. We know what the problems are and what actions lead to positive change for the environment and for future generations. We must follow the independent, scientific, peer-reviewed studies and stop taking advice from unqualified and in many cases, outright corrupt NGOs who are only interested in scaring us into donating our money.

Congress is set to make policy proven to increase harm to the environment based

on misinformation and outright fiction. If you know a reporter, influencer or Member of Congress, then please help to get accurate information in front of decision makers before a catastrophic mistake is made.

A handwritten signature in black ink that reads "Chris DeArmitt". The signature is written in a cursive, flowing style.

Dr. Chris DeArmitt FRSC CChem
President – Phantom Plastics

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Short Biography

Chris DeArmitt PhD FRSC
President – Phantom Plastics LLC

Chris is considered one of the top plastic materials experts and problem-solvers in the world, which is why companies like HP, Apple, P&G, iRobot, Eaton, Total, and Disney come to him for help.

A deep understanding of materials combined with high creativity allows Chris to quickly solve even the toughest challenges. As one example, he solved a serious production issue that had plagued BASF for 30 years and cost them millions. He has also received six open innovation cash prizes, placing him among the top 0.01% of innovators. In 2016, he published the book *Innovation Abyss* which reveals the true reasons for innovation failure and the proven path to success. In 2018, Chris was featured on CBS's 60 Minutes with Scott Pelley as an expert witness in a class-action lawsuit related to Marlex mesh plastic implants. He helped thousands of women get settlements. Later television appearances include Sky News and the BBC as well as assorted radio and internet media interviews.

In 2020, Dr. DeArmitt published *The Plastics Paradox*, the first comprehensive, scientific overview of plastics materials and the environment covering all topics including waste, litter, microplastics, degradation, ocean plastics and more. Chris has a multitude of granted patents as well as numerous articles, book chapters, encyclopedia chapters, and conference presentations to his name. He is an award-winning keynote speaker educating global audiences on plastic materials science and the environmental effects of plastics.

Dr. Chris DeArmitt
President – Phantom Plastics LLC
Cincinnati Ohio, USA
chris@phantomplastics.com
phantomplastics.com

