

Webinar Highlights

Plastics and Climate Change

In this webinar, Judith Enck and Jim Vallette discuss their recent report titled 'The New Coal: Plastics and Climate Change.' The report documents the often overlooked relationship between plastics and greenhouse gas emissions. The report details the impacts of each stage of the plastic cycle, from the fracking and cracking of hydrocarbons to the disposal of plastics through burial, incineration, and as litter.

Featured Speakers: Judith Enck, Founder and President of Beyond Plastics and **Jim Vallette**, Co-founder and President of Material Research L3C, speaking February 23, 2022.

This fact sheet has been created by CHE based on information presented in a CHE Alaska webinar. Selected quotes in bold are from the webinar speaker(s). For the full set of resources provided by the webinar presenters, see the [webinar page](#), where you'll also find associated Slides & Resources.

The Problem

Motivated to reduce national greenhouse gas emissions, the US shut down many coal-fired power plants in recent years. An estimated 65% of coal-fired power plants have been retired in the US. This is a remarkable accomplishment in the drive for cleaner energy. However, these important gains in emission reduction are on track to be eclipsed by increases in plastic production; as the world shifts to cleaner energy, the petrochemical companies are ramping up plastic production, shifting to new ways to keep selling their fossil fuels. As Enck put it, **"Plastics is the fossil fuel industry's Plan B. But there is no Plan B for the rest of us."**

Each stage of plastic production, from extraction to disposal, causes significant greenhouse gas emissions. Jim Vallette's report documents those emissions. The report compares emissions from plastic production to the amount of carbon dioxide equivalent (CO₂e) released by a typical 500-megawatt coal-fired power plant (2 million tons in 2020). CO₂e is a term used by the US government to compare the global warming effects of different greenhouse gases.

The report focused on 10 areas of plastic production:

1. Fracking for Plastics – Fracked gases are used for making petrochemical plastics. The fracking process leaks methane directly into the atmosphere. Fracking releases an estimated 36 million tons of CO₂e gases per year. This is roughly equivalent to the greenhouse gas emissions of 18 average-sized (500-megawatt) coal-fired power plants in 2020.
2. Transporting and Processing Fracked Gases – Pipelines delivering methane to plastics facilities leak an estimated 0.8% of the methane that they transport. This releases at least 4.8 million tons of CO₂e gases per year, equivalent to two coal-fired power plants.
3. Ethane Gas Crackers – To make plastics, fracked gases must be superheated until the gas molecules “crack” into new components, such as ethylene. Cracker facilities require massive amounts of energy to run and also leak greenhouse gases. Cracker facilities were responsible for at least 70 million tons of CO₂e gases in 2020, roughly equivalent to the releases of 35 coal-fired power plants.
4. Other Plastic Feedstock Manufacturing – Coal, methane, chlorine, and ammonia are all used in plastic production, and all have significant climate impacts. For example, coal “gasification” is a process where coal is used to produce plastics. These processes release more than 28 million tons of CO₂e gases per year, equal to the emissions of 14 coal-fired power plants.
5. Polymer and Additives Production – Released at least 14 million tons of CO₂e gases in 2020, equal to the emissions of at least seven coal-fired power plants.
6. Exports and Imports – Feedstocks for plastics are shipped around the world, as are plastic products and plastic waste.

“Ethane obtained by hydraulic fracturing in West Texas becomes single-use packaging in India.”

The export and import of raw materials into and out of the US releases at least 51 million tons of CO₂e gases overseas per year, equal to emissions from 25 coal-fired power plants.

7. Off-gassing from Foamed Plastic Insulation – Fluorochemical gases used in plastic insulation are outsized contributors to climate change.

“The United Nations says that eliminating the use of fluorochemicals in plastic insulation worldwide would prevent over 1 billion – 1 billion, not

million – tons of greenhouse gases per year. That’s 500 coal-fired power plants a year.”

In the US, fluorochemical off-gassing releases at least 27 million metric tons of CO₂e gases per year from buildings and landfills, as much as 13 coal-fired power plants. Many existing types of insulation work just as well and do not have nearly such an impact on climate change.

8. “Chemical Recycling” – Petrochemical companies market “chemical recycling” as a new, “advanced” method of plastic recycling. In reality, most of the methods for “chemical recycling” convert the plastics into fuel to be burned rather than new plastic products. Expansion of pyrolysis and other so-called “advanced recycling” has the potential to add up to 18 million tons per year by the year 2025, equal to the emissions of nine coal-fired power plants.
9. Municipal Waste Incineration – Releases an estimated 15 million tons of CO₂e gases per year, equivalent to releases from seven coal-fired power plants.
10. Plastics in the Water – As plastic waste in the ocean breaks down, it doesn’t go away. Rather, it becomes smaller and smaller pieces of plastic. Along with other harms to ocean ecosystems, this process also releases methane and ethane gases. This is a significant and unquantified source of greenhouse gas emissions.

“Approximately 15 million tons of plastic waste entered the ocean in 2018, and experts predict that dumping and pollution will exceed 40 million tons annually by 2025.”

The estimated greenhouse gas emissions given in this report are baselines. The true climate impacts from plastics are likely far higher.

Key finding: Overall, the US plastics industry is responsible for at least 232 million tons of CO₂e gases per year, equivalent to the emissions of 116 coal-fired power plants.

“As power plants close and petrochemical infrastructure expands in the US, the plastics industry’s contribution to climate change will exceed that of coal by the year 2030.”

Jim Vallette highlighted that the report also shows that pollution from plastic production disproportionately impacts low-income communities and people of color. Most of the climate pollution from the plastics industry in the US occurs in just 18 communities.

“People living within three miles of these petrochemical clusters earn 28% less than the average US household and are 67% more likely to be people of color.”

Recommendations

- Enforce existing environmental laws. The US Environmental Protection Agency (EPA) could lessen the harms from plastic production simply by better-enforcing current laws.
- Reduce all phases of the plastics cycle, starting with production. Once the plastics are produced, much damage has already been done. There are currently no environmentally responsible ways to eliminate most existing plastics.

To Get Involved and Find Out More

- Join [Beyond Plastics' grassroots efforts](#) to fight the negative impacts from the production, use, and disposal of plastics.
- Watch the February 23, 2022 webinar: [Plastics and Climate Change: Consequences of Plastics Production, Use, and Disposal as a Major Contributor to Climate Warming and Harm to Health](#)
- Read the Beyond Plastics press release about the report: [Plastics To Outpace Coal In Driving Climate Change](#)
- Read the report: [The New Coal: Plastics & Climate Change](#)

About the Speakers



Judith Enck is the founder and president of Beyond Plastics, an initiative that works on plastic pollution issues. She is a senior fellow and visiting faculty member at Bennington College where she teaches classes on plastics pollution. She is also a former EPA Regional Administrator and the former deputy secretary for the environment for the New York Governor's Office.



Jim Vallette, is the co-founder and president of Material Research L3C, a small, low-profit business based in Maine. Jim and his international team specialize in analyzing the global supply chains and impacts of toxic chemicals, greenhouse gases, and waste. Material Research primarily works with non-profit, academic, and government institutions, helping these organizations and individuals with research, analysis and presentation of information important to their respective mission.