

Study shows plastic waste can be converted into energy and fuels

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Credit: The City University of New York

Plastic waste is flooding our landfills and leaking into the oceans, with potentially disastrous effects. In fact, the World Economic Forum

predicts that if current production and waste management trends continue, by 2050 there could be more plastic than fishes in the ocean.

Why is this happening when there are processes and technologies that can effectively recycle, convert to valuable products and extract the imbedded energy from these [waste](#) plastics? According to Science Advances, as of 2015, of the 6,300 million tons of [plastic](#) waste generated in the United States, only 9 percent has been recycled, 12 percent has been incinerated, with the vast majority – 79 percent – accumulating in landfills or the natural environment.

The Earth Engineering Center (EEC|CCNY) at the Grove School of Engineering of the City College of New York is on a mission to transform [plastic waste](#) to energy and fuels.

A recent EEC study titled "The Effects of Non-recycled Plastic (NRP) on Gasification: A Quantitative Assessment," shows that what we're disposing of is actually a resource we can use. The study, by Marco J. Castaldi, Professor of chemical engineering Director of Earth System Science and Environmental Engineering and Director of the EEC|CCNY and Demetra Tsiamis Associate Director of the EEC|CCNY, explores how adding NRPs to a chemical recycling technology called gasification – which transforms waste materials into fuels – adds value.

Adding NRPs to the gasification process helps reduce greenhouse gas (GHG) emissions while significantly reducing the amount of waste byproduct to landfill – by up to 76 percent.

In the study, published by the American Chemistry Council, the effects of increasing the percentage of non-recycled plastics (NRPs) are measured at Enerkem, a Montreal-based energy company, in collaboration with the City of Edmonton in Alberta, Canada.

"This study demonstrates that because carbon and hydrogen rich plastics have high energy content, there is tremendous potential to use technologies like gasification to convert these materials into fuels, chemicals, and other products. We were fortunate to engage a couple of students and engineers from our team enabling them to learn about this novel process," said Castaldi.

Tsiamis added: "Plastics have an end of life use that will be turning waste into [energy](#), which is something we all need and use."

More information: The Effects of Non-recycled Plastic (NRP) on Gasification: A Quantitative Assessment, [plastics.americanchemistry.com ... ification-Report.pdf](https://plastics.americanchemistry.com/gasification-Report.pdf)

Provided by The City University of New York

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