



## Sorting through Plastic Waste – Is Chemical Recycling a Solution?

### Background

While waste disposal has been an issue for quite some time, it was not until recent years that public and private sectors have become increasingly aware of it due to the environmental implications associated with this worldwide problem. Since plastics are imbedded in thousands of products that are part of our everyday life, with consumption over 300 million tons per year and growing, they make up a major component of waste material. Thus, local governments, as well as public and private companies, are focusing on ways to reduce/eliminate plastic waste. Plastics recycling is considered the best option due to its energy and GHG emissions benefits, although there are limitations to conventional methods.

### Objective

Chemical recycling handles plastics that are considered hard to recycle by conventional methods. Additionally, this developing technology can potentially provide the food-grade recycled content needed for brand owners' sustainability goals (otherwise not provided by conventional mechanical recycling). PET, PS, and mixed plastics have been the targets of recent chemical recycling technology, since they account for more than 80 percent of global polymers produced.

This detailed study examines the chemical recycling of PET, PS, and mixed plastics (plastics to fuel) by:

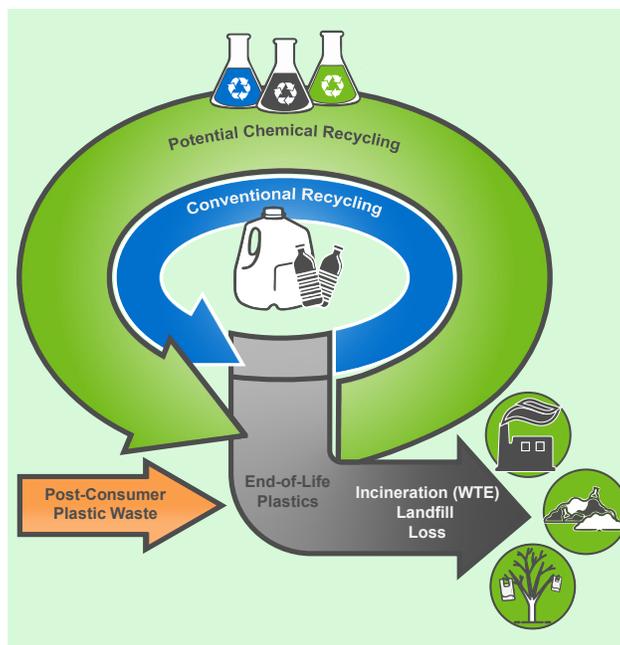
- Profiling selected technology developers of chemical recycling processes
- Evaluating the selected technology developers
- Developing economics of chemical recycling and comparing them to virgin material produced by conventional technology
- Analyzing the MSW stream and providing economics for the incineration of waste with energy recovery

This report incorporates expertise Nexant has gained over many years of examining polymer technology developments as well as the knowledge gained during recent recycling studies. Thus, the information used to develop this report is derived from in-house sources as well as information provided by several technology developers, conversations with experts in the area, and publicly available resources.

### What is Included in the Report?

- High level profiles of PET, PS, and plastics to fuel chemical recycling technology developers
- A ranking of the profiled companies on criteria such as:
  - Capital investment
  - Status of the technology
  - Feedstock flexibility/availability/cost
  - Environmental impact (i.e. CO<sub>2</sub> emissions)
  - Product
- Economics for chemically recycling several types of plastic waste during the second quarter of 2019 for USGC, Western Europe, China, Japan, and Southeast Asia locations
- Delivered cost competitiveness for exporting recycled PET and PS to China
- Economics for producing PET water bottles and PS yogurt containers from virgin material and/or recycled content
- Economics for plastics to fuel and/or naphtha

### Chemical Recycling as a Potential Solution to Plastic Waste



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