

Homework 3 Plastics in a Circular Economy

This week Ryan Breese gave a presentation concerning LyondellBasell and the importance of the circular economy to the polyolefin industry.

- a) LyondellBasell recently purchased a number of polyolefin recycling companies in California, Germany, China and in the Netherlands as well as closing a major polypropylene plant in Italy. Glance at the attached press releases and short articles and comment on the commitment of LyondellBasell towards the circular economy. What do you think is motivating these business moves?

LyondellBasell Shutter Polypropylene Plant in Italy

<https://www.sustainableplastics.com/news/lyondellbasell-announces-plans-shutter-pp-plant-italy>

<https://www.lyondellbasell.com/en/news-events/corporate--financial-news/lyondellbasell-acquires-mechanical-recycling-assets-and-plans-operations-in-california/>

<https://www.lyondellbasell.com/en/news-events/corporate--financial-news/lyondellbasell-acquires-25-of-cyclyx-joint-venture-joining-agilyx-and-exxonmobil-to-accelerate-plastic-waste-recycling/>

<https://finance.yahoo.com/news/lyondellbasell-lyb-acquire-apk-ag-104800948.html>

<https://www.rebnews.com/lyondellbasell-to-acquire-german-recycling-innovator/>

<https://www.lyondellbasell.com/en/news-events/corporate--financial-news/lyondellbasell-and-genox-recycling-open-plastics-recycling-joint-venture/>

<https://www.chemistryviews.org/lyondellbasell-to-acquire-apk-ag-recycling-technology/>

- b) There have been many lawsuits around the world that seek to hold the petrochemical industry financially responsible for global warming since internal documents have surfaced indicating prior knowledge dating back at least to the 1960s as well as purported efforts to mislead the public. Recently, a similar effort is being made with the plastics industry to deal with plastics waste
https://www.theguardian.com/us-news/article/2024/sep/09/us-voters-distrust-plastics-manufacturers-claims?CMP=Share_iOSApp_Other . Comment on this short article either in favor of accountability or in defense of the plastics industry using what you heard from Ryan.
- c) The price of polyolefins is closely linked to the price of crude oil. Do a google search and find the price per lb of kerosine, gasoline, diesel, HDPE, iPP, LLDPE, LDPE. You will need to find the density of the liquid fuels. Try to find similar prices from a few years ago to see how these prices trend and are coupled.
- d) Given the link between petrochemical refining and polyolefins, give your opinion on the future of polyolefins. What is “peak oil”? Also, consider the limitations which may be imposed in an attempt to restrict global warming to 1.5°C as discussed in this short article and other things on line.

<https://grist.org/energy/for-a-livable-future-60-of-oil-and-gas-must-stay-in-the-ground/>

- e) From Ryan's presentation and your own thoughts, what is the feasibility that recycled polyolefins can substantially supplant virgin polyolefins eliminating the need for increasing consumption of crude oil?