

Circular Economy with Plastic: Plastic Waste, Recycling, and Biodegradable Plastic

Seung Hye Lee(amitoe@outlook.com)

Leipzig University

Abstract

Abstract

Our current economy is heavily dependent on consumptions of products made from non-renewable resources, such as fossil. Let alone the climate change caused by carbon emissions from burning fossil for production and transportation of all the goods and our daily lives, our planet is being covered by enormous amount of non-compostable waste. With the current rate of consumption and even more rise coming, the planet won't be able to source enough resources.

There have been many researches and also practices done around the world to "manage" the waste, thus "waste-management," such as separation of waste, recycling schemes, deposit system, manufacturer-responsible scheme, waste-to-energy facilities and so on. However, "recycling" in current world, contrary to what it may sound, does not make a circular "cycle" of resources, especially for non-renewable resources such as plastic, which make up very large portion of our waste. For Plastic, the conventional waste-management method, including recycling and high-tech waste-to-energy facilities, will at best make the waste "disappear," by burning them.

Then, what shall we do and what can be done? An ultimate solution can be done by closing the loop of our production. One solution will be developing technologies to actually "recycle" plastic, using the plastic products already made, to make the new products back. Currently what we call "recycle" is merely a "down-cycle" where the product stream cannot be met in a circular way, and only possible for limited kinds of plastic. The another and a better solution in long term will be to prevent the use non-renewable resources altogether. If conventional plastics can be replaced to biodegradable plastic that can be degraded into the nature quickly without leaving harms, the loop can be closed.

The current status of plastic usage and disposal will be introduced; types, amount produced, recycling method and rate, and the problems on non-circularity. Then we will look into the definition and current status of biodegradable plastics, how they shall be treated and how they are actually being treated at the moment. We will discuss the challenges and possible solutions.

Keywords: *circular economy, Sustainability, environment, plastic, waste, material flow*

References

- [1] Global Waste Management Outlook. United Nations Environment Programme. 2015
- [2] What a Waste. A Global Review of Solid Waste Management. 2012

Biography

Masters graduate in Joint International Masters in Sustainable Development from Leipzig University. Interest in environmental science, waste treatment, circular economy, zero-waste movement, ecological land management and veganism. Studied electrical engineering in Seoul National University and worked as an electrical engineer in Hyundai Engineering & Construction.