

LIVING WITH PLASTICS

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Abstract

Plastics are so embedded in daily life that discussion of an economy without plastics is fantasy. Plastics represent a small fraction of human use of fossil hydrocarbons, so that production of oil-based plastics is not and will not be constrained by resource availability. Incentives to produce bio-based plastics therefore arise for other reasons. Environmental problems associated with plastics arise predominantly from waste rather than production or use of plastics. Biodegradability is difficult to measure and assure, and is therefore not a reliable guide to environmental compatibility. Legislation and regulation against the environmental impacts of plastics therefore need to concentrate on preventing the dispersion of plastic waste into the environment. A review of the industrial ecology of common plastics reveals where regulatory attention should be focussed.

Although packaging represents the largest single use for plastics, there are other uses that also contribute to plastic waste, notably textiles, transportation and building and construction. There are some uses of plastics, such as personal care products and cosmetics, in which the material is designed to be released into the environment after use. There are other sources of plastic debris, such as dust from tyres on road vehicles, which are harder to prevent. However, for most plastic products, a closed-loop industrial ecology system is already in place. The system could be improved to obtain more utility from plastics in use, mainly through increasing re-use and recycling, but in principle uncontrolled releases of most plastics need not occur: most plastic waste entering the environment is emitted as dispersed "fugitive" emissions or litter. Regulation should therefore focus on avoiding casual releases.

In addition to emissions to the atmosphere and the oceans, significant quantities of waste plastic enter rivers and are then conveyed into the ocean. In addition to reducing releases of plastic waste, it is necessary to screen waste out of the most contaminated rivers and to recover it from the oceans. Plastic debris recovered from rivers is usually too mixed and contaminated to be recycled, but it may be usable as fuel for generation of electricity and/or heat. However, plastic debris recovered from the ocean is too mixed and contaminated even for use as a fuel - It must be consigned to landfill. Small Island Developing States (SIDS) are particularly vulnerable to the effects of marine pollution by plastics.

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