Precycling: Novel Strategies for Dealing with Household Plastic Recycling

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Although recycling is a common practice in many societies, the large volume of waste and the high cost of recycling these materials has led to global problems. Much of the waste is shipped to underdeveloped countries where it is inefficiently processed. This can lead to pollution and more plastic landing in the oceans. Pre-cycling introduces processing steps that can turn plastic waste into higher-value forms. This will make the cost of recycling plastic worthwhile to waste companies. Cleaning the plastics requires significant amounts of water and removing packaging materials is labor-intensive. Pre-sorting and melting the plastics into a high-density block is the first in such steps that are needed to process the recycling materials. In addition, there is a high energy cost associated with melting plastics. Two types of plastic (PET and HDPE) were heated in a convection oven. HDPE could be molded at 180 degrees C while PET required much higher temperatures. A prototype solar oven was designed, built and tested for use as an alternative to electrical convection heating. Significantly less power is available in a solar oven, but the resource is renewable.

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