

Analysis of Resource Footprint for the use of Reusable Cups in Island Area Using Life Cycle Assessment

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Abstract

In island areas frequented by tourists, many disposable cups were consumed through take-out services at cafes. As part of Korea's circular economy initiative to reduce plastic wastes, J Province introduced a reusable cup program. This study evaluates resource footprint of a reusable cup relative to one of a disposable plastic cup and a disposable paper cup in an island area, using life cycle assessment (LCA) as the evaluation methodology. This study site was U island, and the selected product was a 16 oz reusable cup, the size most frequently used. The functional unit was defined as one use of 16 oz reusable cup. For the reusable cup, the system boundary covered the raw-material acquisition and production of one use 16oz reusable cup, washing, post-use collection, final disposal, and transportation from the production site to the washing center and during collection. For a disposable plastic cup and a disposable paper cup, the system boundary covered from the raw-material acquisition and production, final disposal and transportation from the production site to cafes. The resource footprint was 0.282 g Sb eq./F.U. for the 6.5oz reusable cup, 1.42 g Sb eq./F.U. for the disposable plastic cup, and 0.0219 g Sb eq./F.U. for the disposable paper cup. The reusable cup thus reduced the resource footprint by 80% relative to the disposable plastic cup, while exceeding that of the disposable paper cup by approximately 12 times. It was found that the resource footprint of a 16oz reusable cup decreases compared to the use of one disposable paper cup when the number of uses exceeds 150. These results will be provided as the basic data to activate the use of a reusable item included in a reusable cup policy in island regions of Korea.

Key words : Reusable cup, Disposable cup, Island area, Resource footprint, LCA