



PC Plastics



Problem: Sustainable Development- assist PC Plastics to estimate carbon offsets for styrenic resins production from post-consumer recycled materials.

i.e., estimate reductions in Greenhouse Gas (GHG) emissions, also called Carbon Offsets, from using Styrofoam or expanded polystyrene (EPS) to produce modified Styrenic (e.g., HIPS) resins.

Approach: Use PC Plastics process data and results from public sources* to calculate reduction in greenhouse gases as CO₂ equivalents (CO₂-Eq.).

*Association of Plastics Manufacturers Europe (APME), the Oregon Department of Energy (OR-DOE), the Oregon Department of Environmental Quality (OR-DEQ), and the US Environmental Protection Agency (US-EPA).

Results: Calculations showed PC Plastics process provided ~50% reduction in GHGs when compared to *de novo* (i.e., petroleum-derived) synthesis.

i.e., ~2.3 kg CO₂-Eq. per kg HIPS for recycled EPS vs. ~4.5 kg CO₂-Eq. per kg HIPS for *de novo* synthesis.

Comments

- ~ ±20% uncertainty estimated in calculated values for this work.
- EPS disposal options (i.e., landfill, incineration) affect GHG emissions significantly and therefore affect public policy for sustainable development.