



Plastics - a climate change protector

Denkstatt Study Overview

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PlasticsEurope
Association of Plastics Manufacturers

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It is worth noting from the onset that this report is meant to highlight the position of plastics and it is not the intention to indicate superiority for any category of materials. A wide variety of materials types have a role to play in modern society and indeed materials are often selected for their efficiency or synergy within a system or product combination.

This study considers the scenario where plastics would be replaced by a mix of alternative materials.

In reality society has come to enjoy the benefits and the convenience that plastics materials provide to such an extent that this is an impractical proposition.

Furthermore, plastics have established themselves so extensively within the spectrum of modern materials that there are some applications (approximately 16%) designed with plastics, which cannot be feasibly substituted.

Nevertheless, the resultant effects on greenhouse gases (GHG) emissions and energy consumption of substituting plastics with other materials have been estimated.

The study, commissioned by PlasticsEurope and peer reviewed, considers several cases in detail which represent 80% of the plastics market place and the results are projected across the industry.

The scope of the study is so large that a number of extrapolations and assumptions have had to be made. Nevertheless the general conclusions are considered valid.

The report is not an LCA as such; however the principles of LCA have been followed and the data for comparison within the case studies are extracted from LCA databases which cover the three main phases of a product lifespan (production, use phase and waste management).

The study consist of two parts:

- 1) An update of an earlier study (by GUA) on GHG and energy savings arising from plastics use, which was expanded to comprise the current EU member countries (it is in fact EU27+2); and which considered updated material datasets for the cases selected.
- 2) Additional arguments on plastics benefits with regard to greenhouse gases and energy efficiencies, and based upon some of the current trends - a forward projection to the potential scenario in 2020.

The key messages and conclusions arising from the study are as follows:

- 1) Despite the often negative perception of plastics products they do in fact make a significant contribution towards environmental protection offering resource efficient solutions
- 2) Plastics often enable reduced material consumption
- 3) The deployment of plastics enables greenhouse gases and energy savings across a wide range of modern applications
- 4) It is important to consider GHG and energy savings across the entire lifecycle of products and the production and use phases are the most significant

- 5) Substitution of plastics where it feasible (based upon 2007 scenario) would: -
Generate 3.7 times more mass (impacting waste management)
 - Result in 50% more GHG
 - Lead to 46% more energy being consumed

It is worth remembering that the EU is committed to reduce GHG emissions to 20% below the level experienced in 1990 by 2020

With regard to greenhouse gas emissions savings resulting from the use of plastics:

- 1) The current savings (120M Tonnes per annum) are comparable with the entire CO₂ emissions of Belgium
- 2) These savings currently represent 38% of the original EU15's original Kyoto CO₂ reduction target (or approximately 15% of the EU27's 2020 target of 780 Mt)
- 3) The absence of plastics from the materials spectrum would effectively impair the EU's ability to meet its Kyoto GHG reduction targets

With regard to energy savings resulting from the use of plastics:

- 1) Energy efficiencies contribute strongly to emissions reductions
- 2) 2, 300 Tera Joules (Tera = 10¹²) less energy consumed per annum
- 3) 50 Million Tonnes of crude oil per year (equivalent to 194 very large crude carrier loads)

The findings of the second part of the study show that:

- Production and use phases are most important.
- Plastics materials play a key role in the generation of renewable energy
- Plastics are an enabler of new technologies which significantly reduce resource use (e.g. de-materialisation in memory cards or MP3 players)
- Plastics represent a small proportion of the average European's carbon footprint (1.3%)
- The increased adoption of plastic in thermal insulation, for food packaging or to produce renewable energy enables extraordinary "use"-benefits.
- The carbon balance (the ratio of the carbon intensity of production in relation to the savings and benefits across the life cycle) is presently in the range of 5-9
- This carbon ratio is set to improve to between 9-15 by 2020; indicating that the benefits in use in the future are far higher than the additional emissions from the growth of plastics

N.B: EU 27+2 represents the 27 Member States plus Norway and Switzerland

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