DENKSTATT REPORT

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This report by the Denkstatt Environmental Consultancy of Germany https://denkstatt.eu/portrait/?lang=de shows that it would be a serious mistake to ban plastic and use other packaging materials instead.

The conclusions of the report were that:

- Plastics applied in the packaging sector today, are mostly used as a very energy efficient material. Plastics enable resource-efficient packaging solutions, which result in significant savings of energy and GHG emissions. This is due to the fact that plastic packaging facilitates significantly reduced material consumption which results in less energy consumption for the same functional unit.

- In addition many plastic packaging products save significant amounts of energy and GHG emissions during the use phase. These benefits are especially significant, when plastic packaging can be used to increase the shelf-life of food resulting in reduction of food wastage.

- Vice versa the substitution of plastic packaging by other materials would in most cases increase energy consumption and GHG emissions.

- Finally a “carbon balance” for plastic packaging shows that the estimated use benefits are at least 5 times higher than the emissions from production & recovery.

In order to produce plastic packaging, energy resources are consumed. Currently such energy resources are almost entirely obtained from non-renewable sources and by using them, greenhouse gas (GHG) emissions are produced. Nevertheless, even more energy would be consumed and more GHG emissions emitted, if plastic packaging were to be substituted by alternative materials.

In addition, many plastic packaging products enable energy savings during their use-phase, even without being compared to other materials. Examples are packaging applications that reduce food losses or help to avoid damage to durable goods.

The goals of this analysis were to

- calculate the life-cycle energy consumption and GHG emissions, if plastic packaging applications in Europe (EU27+2) were to be (theoretically) substituted by a mix of alternative packaging materials as available on the market

- explain why even the use of current fossil fuel based plastic packaging does indeed make a significant positive contribution to goals of energy efficiency & climate protection

- formally confirm that the use of plastic packaging can in many cases actually help save resources across the whole life-cycle

- investigate some other important issues related to energy consumption and GHG emissions, like the use of biodegradable plastics or the effects of different ways to recycle and recover plastic waste.

The analysis found that if plastic packaging were to be substituted by other materials:

- the packaging mass would on average increase by a factor of 3.6
- life-cycle energy demand would increase by a factor 2.2 or by 1,240 million GJ per year, which is equivalent 27 Mt of crude oil in106 VLCC tankers or comparable to 20 million heated homes
- GHG emissions would increase by a factor 2.7 or by 61 million tonnes of CO2-equivalents per year, comparable to 21 million cars on the road or equivalent to the CO2-emissions of Denmark.
- GHG benefit due to prevented food losses as a result of using plastic packaging to protect fresh food is at least equivalent to 37 % of production emissions of all investigated plastic packaging.
- Also a "carbon balance" was established, defined as the "amount of greenhouse gases prevented" (as a result of the use- and recovery-benefits of plastic packaging) divided by the "amount of greenhouse gases emitted during the production of plastic packaging" (both figures expressed in CO2-equivalents).
- Such a carbon balance has been established for the total market of plastic packaging consumed in the EU 27+2 in the year 2007. It should be noted that the list of examples for use benefits in the carbon balance is not complete, but rather shows relevant applications where the benefits have so far been quantified
- In 2007 the estimated use benefits of plastic packaging were 5 times higher than the emissions from the production and recovery phases.
- Generally the relevance of the environmental impacts of packaging seem to be overestimated by far, because:
    - Only 1.7 % of the total consumer carbon footprint is related to all domestic and commercial packaging materials used in the EU27+2
    - The use of plastic packaging is related to only 0.6 % of the average carbon footprint of the European consumer.

Further important findings are:

- The GHG benefit of prevented food losses is (on average) at least 5 times higher than the burden of packaging production, if only 10 % less of the packed food is wasted.
- Recycling and recovery of plastic packaging helps saving energy resources; recovery processes with high efficiency also enable reductions in GHG emissions.
- The annual plastic shopping bag consumption is equivalent to (only) 0.14 – 0.3 perMILL of the average consumer carbon footprint or comparable to 13 – 26 km of driving.