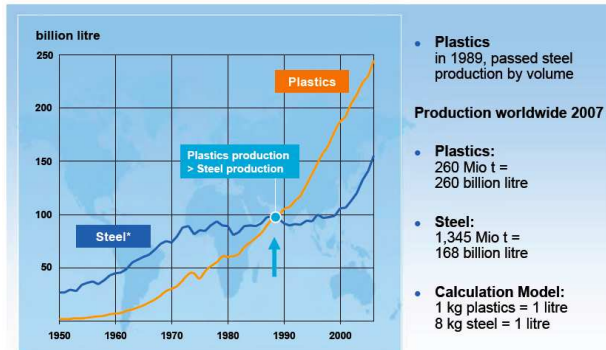


# Polymers and the Environment

Resume of the project proposal

Polymeric materials have only been used in



abundance since about 60 years, yet today the production per volume is more than that of iron and steel. Modern synthetic polymers have low material costs and are easily used in large-scale production of goods. Thus they are the reason many people today can afford products such as cars, electronic equipment, eyeglasses, shoes etc. which would be too expensive or even impossible if produced from other materials.



Polymers are mostly made out of mineral oil and the aim of

the polymer producer is generally to make durable, solid materials which will give good material properties for the whole life of the final manufactured part and beyond. After use the plastic can be reused. The steps necessary are:

## **collection**

**sorting** according to polymer type, as polymer melts generally don't mix well

## **recycling**

- as a part (f.i. reusing the bottle)
- as materials (melting, forming)
- as monomeric building blocks (chemical recycling)
- using the incorporated heat (burning in a modern incinerator with heat exchanger etc.)

The most critical step is the **collection**. If the polymeric part does not represent a value it will end in the environment. The problems that then arise are:

- The part will survive for a long time as corrosion and degradation (reaction with oxygen and UV-light) will occur, but extremely slowly.

- Due to their lightness the plastics part will be scattered in the landscape. If they reach rivers or sea, plastics having a density lower than water will swim on the surface.



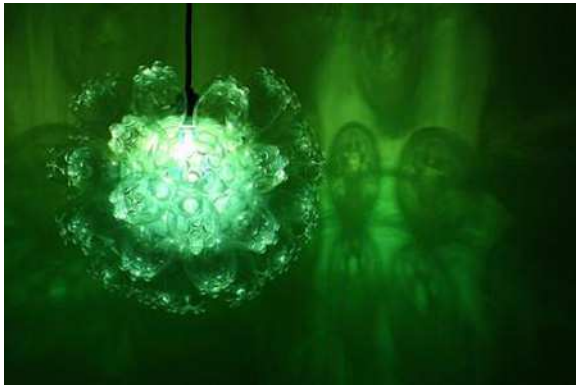
- Animals might eat the plastic, thereby “filling” their stomachs or get caught up in parts such as fishing nets.
- The energy incorporated in the plastic is lost.
- Nonpolar plastic surfaces act as collectors for nonpolar (often toxic) substances.

## Discussion topics and actions

What are the systems for plastic collection and recycling in the home countries of the IP participants? Find out, compare and discuss the merits of the different systems. You will probably have to divide into different areas such as electronic equipment or packaging. Concentrate on the areas that seem most relevant to you.

The IP will produce polymer waste too: packaging from food and others. Collect, categorize and evaluate: how much waste is produced in total (weight and volume), which polymer types did you find, how much per type, what is the energy content etc.

Find a way to show the amount of waste for all



to see!

Can you think of any way to produce something nice / usable from the discarded plastic?

Optional:

If the weather is good and we get to go to the seaside: collect plastic in a measured area on the beach. Collect a sample of sand and try to find out if (or rather how much) very small plastic particles are contained in the sand.

<http://www.plasticseurope.org/> - European Organisation of Polymer Manufacturers, contains a wealth of material

Plastics in river and sea

<http://www.sea.edu/plastics/index.htm>

<http://www.plasticdebris.org/>