LIFE CYCLE ASSESSMENTS

Why are Life Cycle Assessments useful?

A life cycle assessment is a way to identify the potential impacts that a manufactured product might have on the environment in all stages. These are useful because they identify the impacts that a manufactured product could have on the environment.

Life Cycle Assessment of a plastic bottle:

Raw Materials

The raw material used in making plastic bottles is crude oil. This is a non-renewable source. The crude oil is separated by fractional distillation, this is a high-energy process where a tall column is fitted above the mixture, with condensers coming off at different heights. The column is hot at the bottom and cool at the top. Substances with high boiling points condense at the bottom and substances with lower boiling points condense on the way to the top. Molecules with a longer chain fraction are cracked to produce smaller, more reactive molecules. These can be useful to make new chemicals. To make a plastic many monomer molecules are joined together by polymerisation reactions to make a polymer.

All of these processes require high amounts of energy.

Manufacturing

A plasticiser is added to make the plastic soft enough to be moulded into the bottle shape. The bottles are very light and strong. The drink is then added into the bottle and they are transported to shops ready to be sold. It is much cheaper to produce plastic bottles in larger quantities.

Use

Once the drink has been consumed, you can wash and reuse the bottle many times. This stage has a lower impact on the environment because plastic bottles are usually stronger so they can be reused many times.

Disposal

When the bottle is no longer needed it can be collected, sorted and cleaned before it is recycled. Recycled plastics can be used to make many things like fleece clothing, or the protective packaging around fruit and vegetables. If they are disposed of as litter, they do not biodegrade. They get put in a landfill and may take decades or centuries to degrade.