DICTIONARY OF BASIC TERMS FROM THE FIELD OF PLASTICS

What is RECYCLING? REGRANULATES? RECYCLABILITY?
All of this will be explained below.

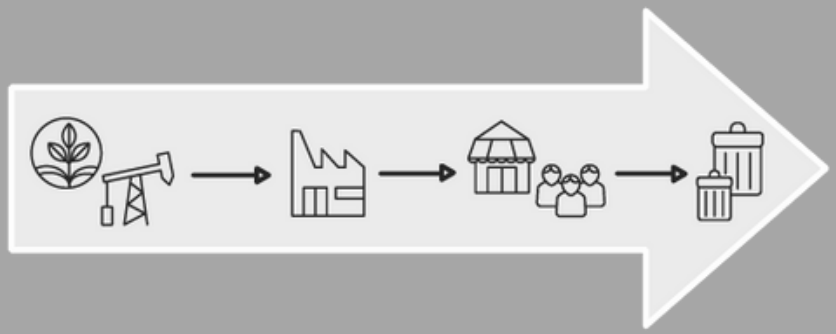
**Plastics are not “troublemakers” by nature.
The problem with them is the way we treat them afterwards.**

GRANITOL
MORAVSKÝ BEROUN

TYPES OF ECONOMIES

Linear

manufacture - sell - consume and dispose



A large percentage of products unnecessarily end up at landfills.

Circular

manufacture - sell - consume - sort - recycle and reuse

Circular economy is a system with almost zero waste. Wastes are put back into circulation thanks to recycling.
Seeds of circular economy have been with us for a long time, for instance, in the form of second-hand shops or used bookstores.

RECYCLING

General

Recycling is the waste treatment process leading to waste recovery.
This means recovery of wastes as a secondary raw material in the production process.

Plastics

There are several basic stops associated with plastic waste:
Sorting into containers – Transport of plastic to sorting lines – Processing for further manufacture – Manufacture of new products from recycled plastic

BENEFITS

- *Reduced need of new raw material extraction*
- *Waste utilisation instead of landfilling*
- *Overall conservation of the environment*

FORMS OF RECYCLING

Mechanical

The most common form of recycling, which does not involve changes in the chemical structure of plastic.

At first, recyclable packaging is separated at the sorting line. It is then crushed and ground into small pieces and rinsed in water. In the next step, the pieces are melted in an extruder and reprocessed in the form of granules, which are supplied to the customers, who, ultimately, use them to manufacture new packaging materials, plastic bags, hoses, car parts, and other recycled products.

DISADVANTAGE

- *The recyclate cannot be fully used in applications for products in contact with foodstuffs, except PET bottles*

Chemical

Also called **depolymerisation**, it is still largely in *testing phase*. If waste plastic cannot be recycled mechanically, for instance, due to the combinations of materials, their excessive diversity, or contamination, it can be processed by chemical recycling.

The principle applied here is utilising the effects of heat or chemical substances to decompose plastic to original substances, from which it was manufactured.

DISADVANTAGE

- *The set-backs are significant investment costs and low product yield*
- *The recovered secondary raw materials are usually more expensive than the primary materials*
- *It can be expected that chemical recycling will complement mechanical recycling*

GRANULATES vs. REGRANULATES

Granulates

PRIMARY raw material

The primary raw material for the manufacture of plastic is crude oil, which must be extracted and processed in the form of granules.

Regranulates

also called recyclate, regenerate

SECUNDARY raw material

Waste sorting leads to recycling and obtaining secondary raw materials that can replace or complement primary raw materials in manufacture.

Plastic regranulates are the final stage of recycling and processing of waste plastic. Thanks to their properties, regranulates become an input for further manufacture, thus providing an environmentally-friendly solution.

Plastic granulates are used in the manufacture of plastic products, which can be labelled “Made from recycled materials”.

KINDS OF REGRANULATES

1. Technological

- created through mechanical recycling of ***waste from GRANITOL's own manufacture***
- 80 % of it is utilised in GRANITOL's products (films, tarpaulins, sacks, bags)

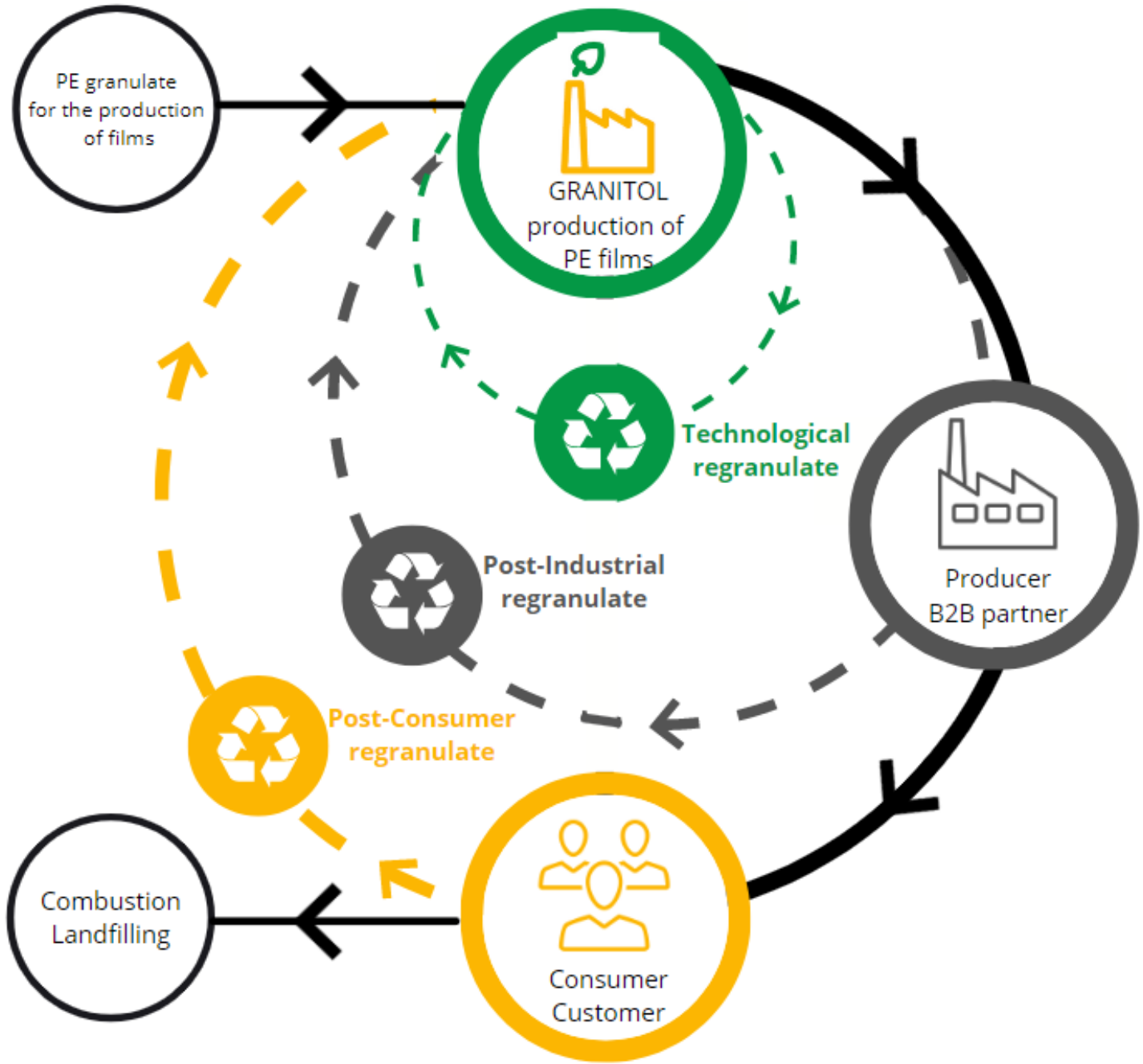
2. PIR (post-industrial)

- created through mechanical recycling ***of waste obtained through buybacks of waste films from our business partners*** (recycling takes place in GRANITOL)
- this waste is sorted and clean; 90–100 % of it can be utilised in our products

3. PCR (post-consumer)

- this is ***waste plastic from end consumers***, i.e., households and commercial/industrial facilities ***(from yellow bins/containers)***
- GRANITOL cannot process this waste, we purchase finished regranulates (it is necessary to find a suitable supplier)
- 90 % of such regranulates can be used in our products

DIAGRAM


PE granulate for the production of films
GRANITOL production of PE films
Technological regranulate
Post-Industrial regranulate
Producer B2B partner
Post-Consumer regranulate
Combustion Landfilling
Consumer Customer

RECYCLABILITY

In order to label any packaging as recyclable, it must meet the following four main conditions:

- the product must be made from plastic that can be collected for recycling
- the product intended for recycling must be sorted at dedicated recycling sites
- the product can be reprocessed/recycled using available recycling processes
- recycled plastic becomes a raw material for the manufacture of new products

A recyclable product must be manufactured from (raw) materials that are recyclable (primary as well as recyclates) using available processes.
The possibility of subsequent recycling should be taken into consideration since initial design phase.

RECYCLABLE vs. RECYCLED

Recyclable films

This means the film can be easily recycled and the regranulates reused.

Film made from a single type of material (LDPE, HDPE, PP) is recyclable.
Film composed of multiple types of material (such as laminate film composed of several diverse layers) is hardly recyclable, and some combinations are not recyclable at all.

Films containing regranulates

This film is 100% made from regranulates or as a combination of a primary material and regranulates. The proportion of regranulates is usually stated in percent.

Such a film can be recycled again at the end of its life-cycle – it can be processed into recyclate to be used for further manufacture of plastic products.

The incorrect term RECYCLED FILM is frequently used in non-technical articles.

SINGLE vs. MULTI-TYPE FILM

Single-type (MONO)

Film made from a single type of material, such as PE, PP, PVC.

Even laminate film (multi-layer film made using lamination technology by layering of the separate films) can be single-type if the layers are from one type of material, e.g., PE/PE, PP/PP laminate film.

Such a film is easily mechanically recyclable.

Multi-type

Film made from multiple types of materials, such as PE/PP, PET/PE, BOPP/PE, so-called laminate film.

As the film layers cannot be separated and sorted individually, mechanical recycling is complicated.

Only chemical recycling is possible in this case.