



PACKALL

PackAlliance:
European alliance for innovation training
& collaboration towards future packaging

Linking **Academy** to **Industry**.

Training program: modules

- **Eco-design & novel manufacturing processing**
 - New materials and biomaterials
 - Citizen and Consumer Engagement
 - Residue management and valorisation



Co-funded by the
Erasmus+ Programme
of the European Union

This project has been funded with support from the European Commission.
This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



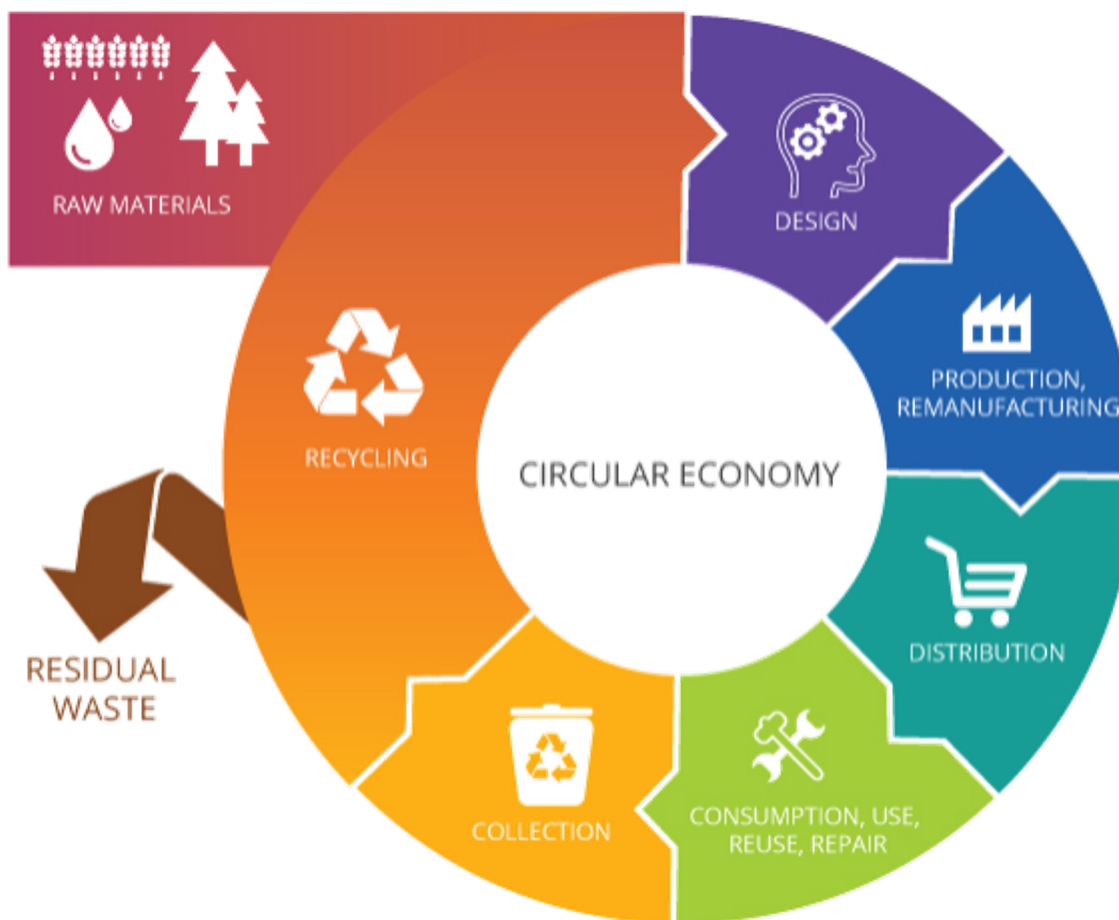


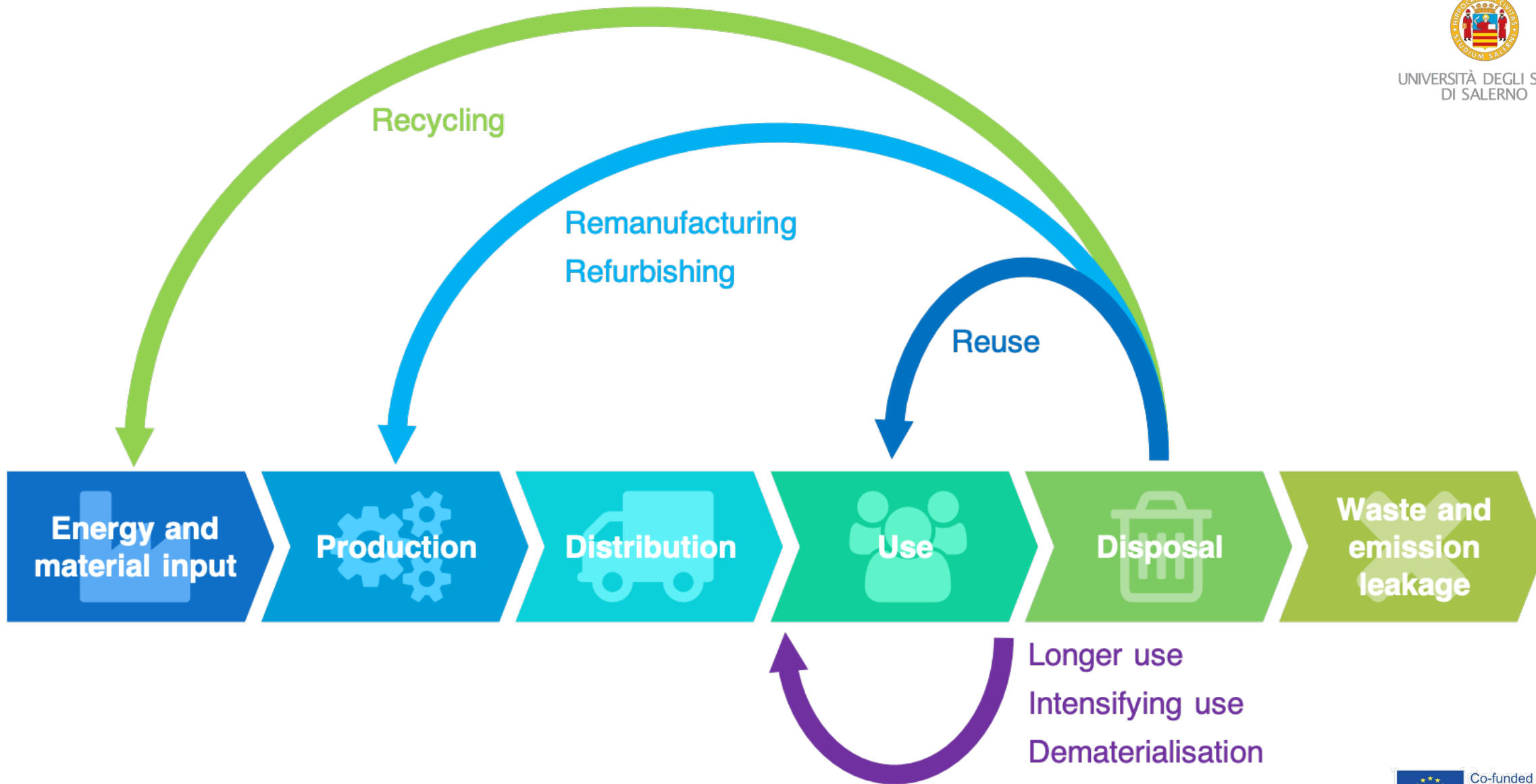
Recycling: one route toward the circular economy

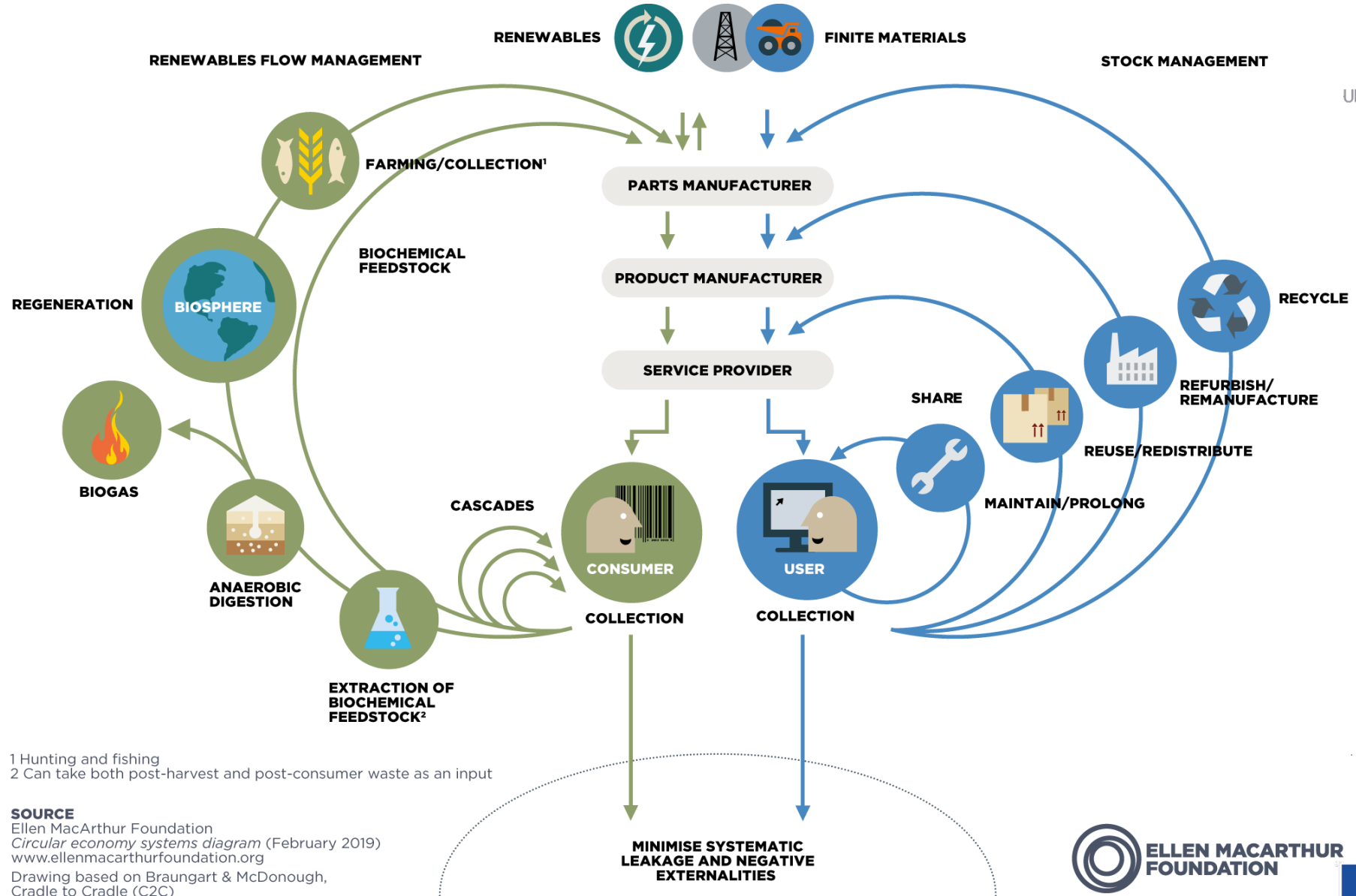
Linear economy vs circular economy



LINEAR ECONOMY

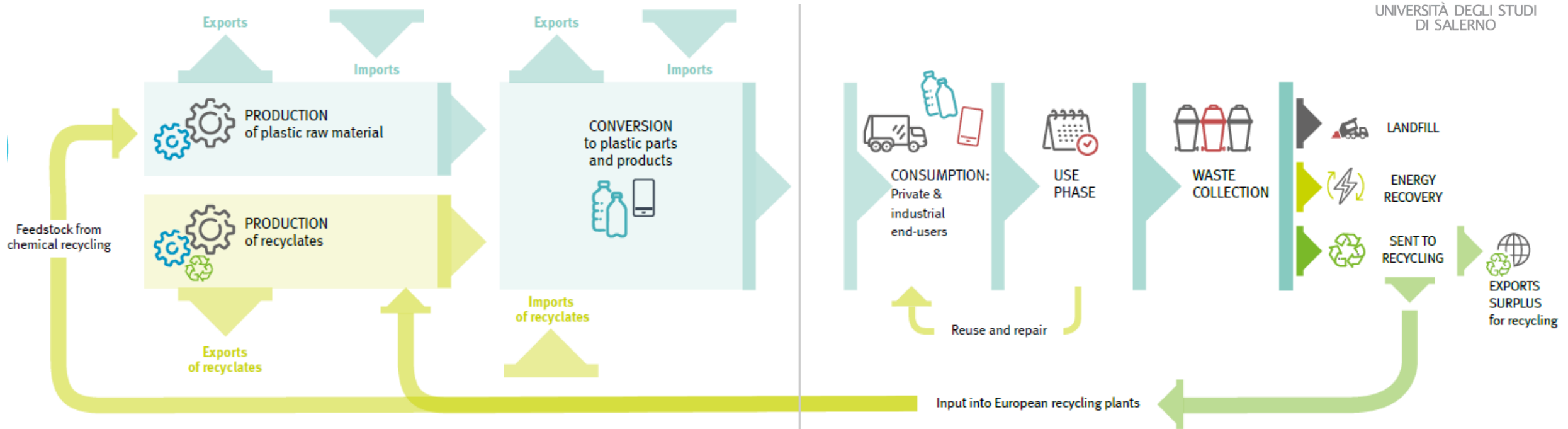






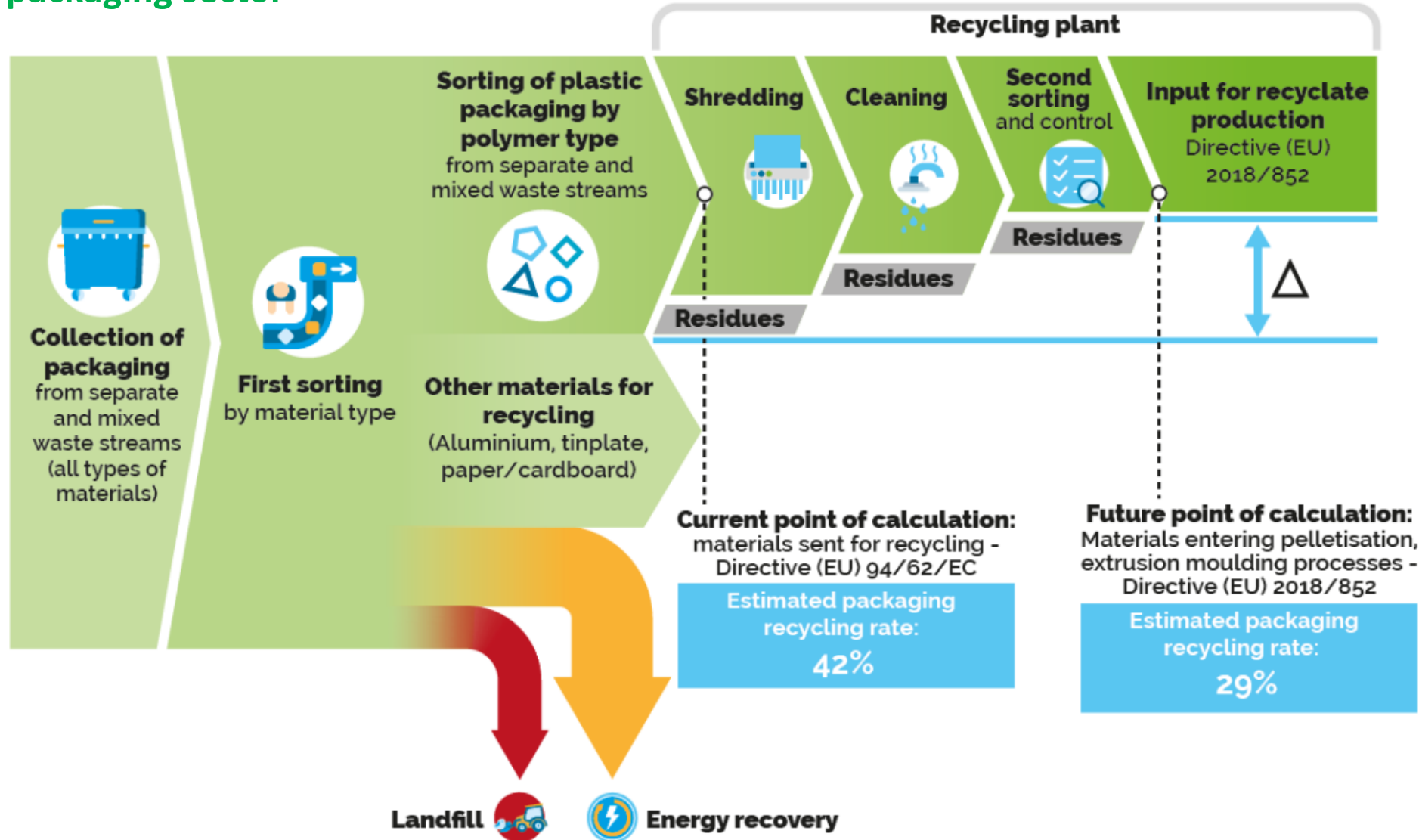
1 Hunting and fishing
2 Can take both post-harvest and post-consumer waste as an input

SOURCE
Ellen MacArthur Foundation
Circular economy systems diagram (February 2019)
www.ellenmacarthurfoundation.org
Drawing based on Braungart & McDonough,
Cradle to Cradle (C2C)

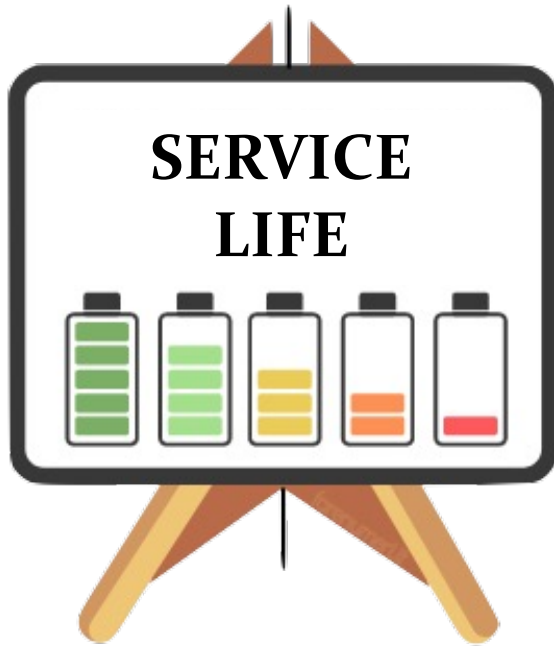


Today, 60% of plastic products and parts have a use phase between 1 and 50 years, or even more. This lapse of time determines when they will potentially become waste. This is why, in a single year, the quantity of collected plastic waste does not match the quantity of production or consumption.

Plastic packaging sector



What is the service life of a product?



Service life is "a product's total life in use from the point of sale to the point of discard".

Service life is strictly related to the type of product and can be strongly different: packaging as a very short service life, durable items (e.g. a PVC window or a car component)

The shorter the service life, the higher the environmental impact of the end-of-life management.

In order to help the policy makers in defining laws and rules to foster the circular economy, in 2018, two international organizations, the European **Plastics Recyclers Europe** (PRE) and the American **Association of Plastic Recyclers**, has worked together to a definition of “**Plastics Recyclability**”, that is what is to be considered recyclable.

Previously, the term «*recyclable*» was used generically, without a clear and univoque definition.



According to this definition, **in order to be considered recyclable**, a plastic item must meet **four conditions**:

Plastics must meet four conditions for a product to be considered recyclable:

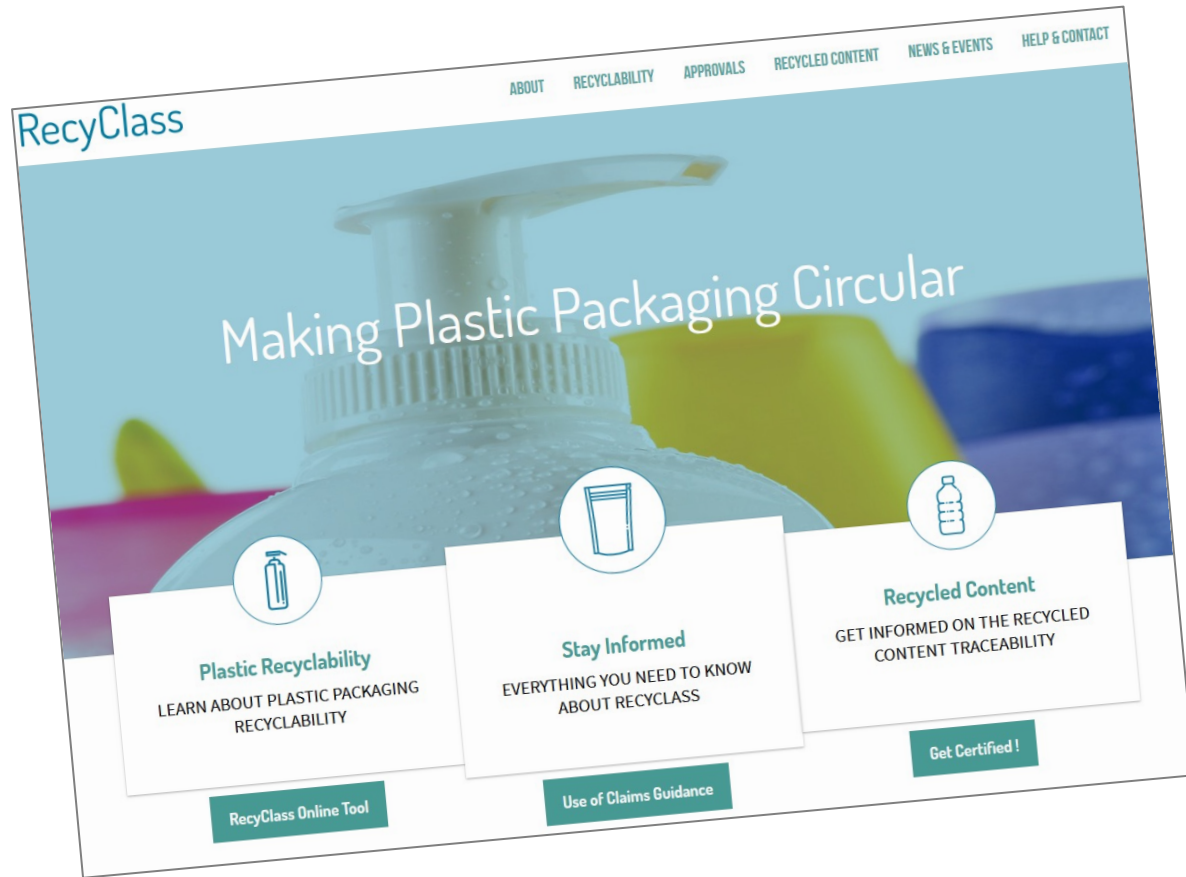
1. The product must be made with a plastic that is **collected for recycling**, has **market value** and/or is **supported by a legislatively mandated program**.
2. The product **must be sorted and aggregated into defined streams** for recycling processes.
3. The product can be **processed and reclaimed/recycled with commercial recycling processes**.
4. The recycled plastic becomes a raw material that is **used in the production of new products**.



This definition **does not intend to restrict innovation.**

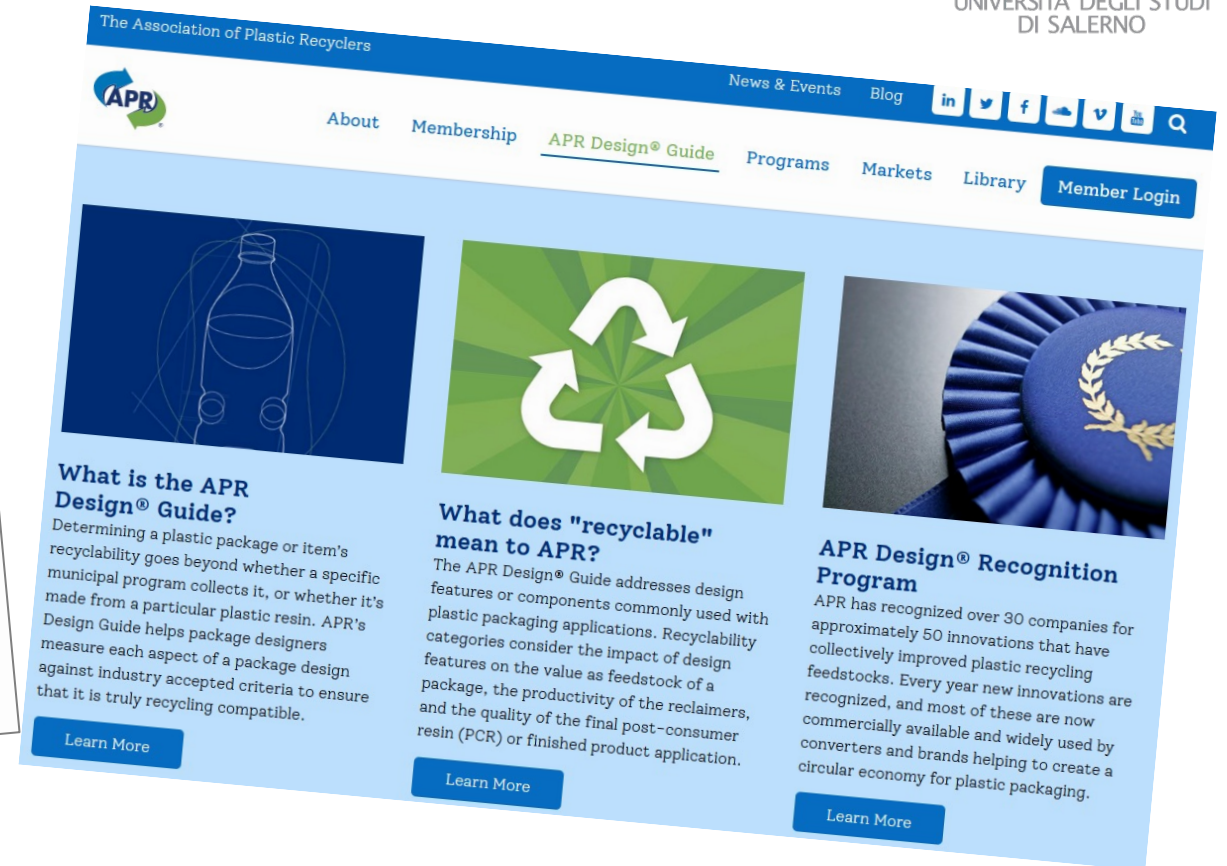
For innovative materials to be recyclable, **it shall be demonstrated that they can be collected and sorted** in sufficient quantities and are **compatible with existing industrial recycling processes** or have **sufficient material quantities to justify operating new recycling** processes.

Nonetheless, **fulfilling these four categories does not automatically designate a product recyclable.** Recycled material is available in many different quality grades which depend among others on the quality of the input material to the process. **Recyclability will however depend on the specific design of each packaging that will have to be evaluated** by the recycling protocols.



The screenshot shows the RecyClass website with a navigation menu at the top: ABOUT, RECYCLABILITY, APPROVALS, RECYCLED CONTENT, NEWS & EVENTS, HELP & CONTACT. The main heading is "Making Plastic Packaging Circular". Below this are three featured sections: "Plastic Recyclability" with a bottle icon and a "RecyClass Online Tool" button; "Stay Informed" with a glass icon and a "Use of Claims Guidance" button; and "Recycled Content" with a bottle icon and a "Get Certified!" button.

<https://recyclclass.eu/>



The screenshot shows the APR Design Guide website with a navigation menu: About, Membership, APR Design® Guide, Programs, Markets, Library, and Member Login. The main heading is "The Association of Plastic Recyclers". Below this are three featured sections: "What is the APR Design® Guide?" with a bottle icon and a "Learn More" button; "What does 'recyclable' mean to APR?" with a recycling symbol icon and a "Learn More" button; and "APR Design® Recognition Program" with a blue award ribbon icon and a "Learn More" button.

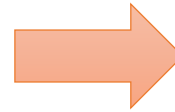
<https://plasticsrecycling.org/apr-design-guide>

Post-consumer fraction

It is based on the products that has been used and completed their service life.

As for packaging they are typically collected by the municipalities.

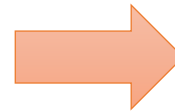
Other sectors have their own collection systems (ELV, WEEE,...)



Eterogenous mixture of may different materials: it must be sorted!

Post-industrial scraps

It is based on post-industrial scraps and products that do not comply with the specifications (off-specs)



Easier recycling process (in some cases it can be milled and reuse immediately)



PACKALL

PackAlliance:
European alliance for innovation training
& collaboration towards future packaging

Linking **Academy** to **Industry**.



UNIVERSITÀ DEGLI STUDI
DI SALERNO



Copyright: CC BY-NC-SA 4.0: <https://creativecommons.org/licenses/by-nc-sa/4.0/>

With this license, you are free to share the copy and redistribute the material in any medium or format. You can also adapt remix, transform and build upon the material.

However only under the following terms:

Attribution — you must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

NonCommercial — you may not use the material for commercial purposes.

ShareAlike — if you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original.

No additional restrictions — you may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.



Co-funded by the
Erasmus+ Programme
of the European Union

This project has been funded with support from the European Commission.

This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

