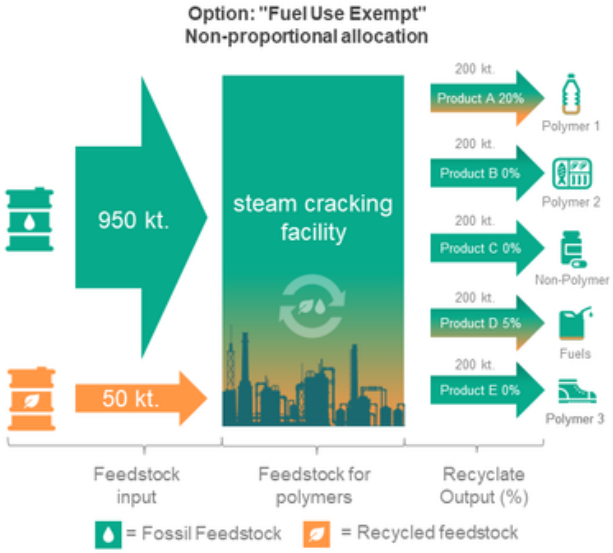
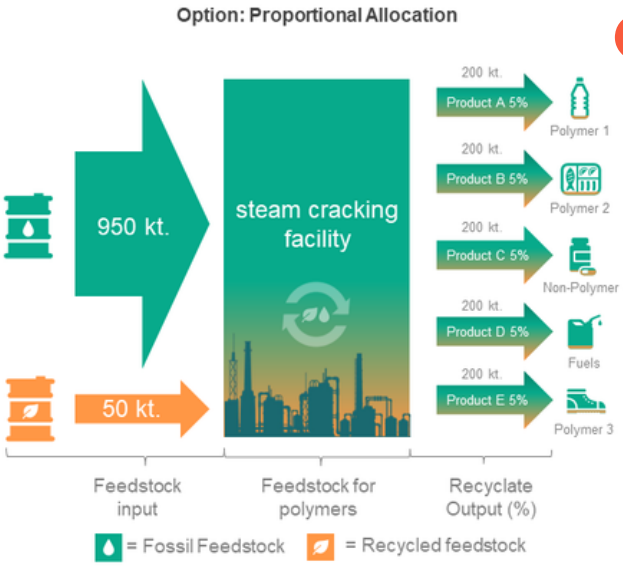
# Mass balances at a glance

Mass balances enable the allocation and documentation of recycled content in chemically recycled plastics, employing regular accounting methods. This is necessary when fossil feedstocks (e.g. crude oil, natural gas) and chemically recycled feedstocks (e.g. pyrolysis oil, process gas) are processed together in large-scale production plants. Using chemically and mechanically recycled materials instead of relying solely on fossil feedstocks contributes to reduce the use of fossil resources in plastic production. However, in large production facilities like 'steam cracking facilities,' determining how the chemically recycled feedstocks are ultimately processed, poses a challenge. Transparent, standardized, and auditable mass balance approaches ensure the traceability and documentation of recycled feedstock. Yet there are different mass balance approaches :




## Option “Fuel Use Exempt”

“Fuel Use Exempt” is the most effective approach to swiftly increase the amount of chemically recycled feedstocks in plastics production. This mass balance approach is especially appealing for businesses looking to invest in the production of chemically recycled feedstocks, as it enables relatively high rates of recycled content in individual products.
With the "Fuel Use Exempt" approach, recyclates can be freely allocated in the production process. However, it's crucial to understand that each ton of recycled feedstock is only charged once. As fuel production falls outside the scope of recycling, fuels are exempt from free allocation. In this case, the distribution of recycled content is proportionate to the input-rates of fossil feedstocks, as seen in the "proportional attribution".

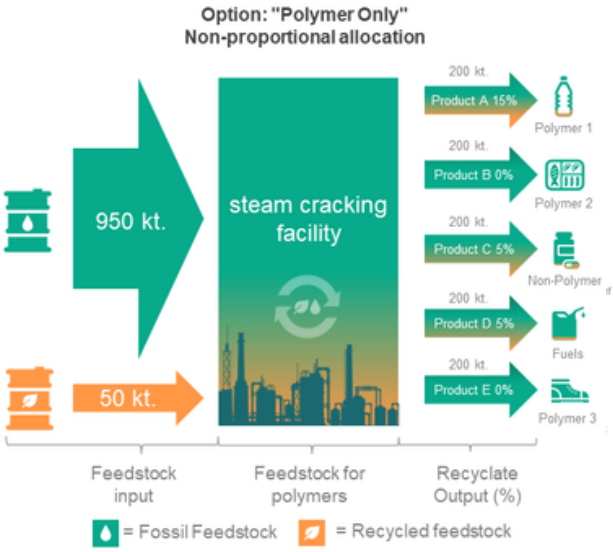



## Option: “Proportional Attribution”

With the "Proportional Attribution," each product is allocated a specific share of recycled raw materials corresponding to the ratio of the incoming mix of feedstocks. However, as the expected percentage of non-fossil feedstocks is projected to be lower than that of fossil resources in the near future, this approach doesn't align with market expectations and regulatory objectives.

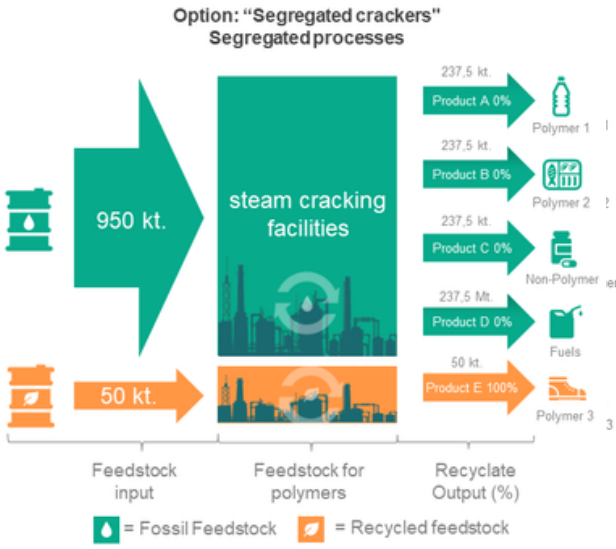
# Alternatives to “Fuel Use Exempt”

Besides "Fuel Use Exempt," there are alternative mass balance approaches with various pros and cons. The European Commission's Technical Advisory Committee is currently discussing the "polymer-only" approach as a potential alternative to "Fuel Use Exempt." However, this approach is facing significant opposition within the European plastics value chain. In a collaborative "**Joint Industry Letter**," 20 of the most prominent industrial associations and organizations within the European plastics value chain underlined that achieving the desired scale of chemically recycled feedstock is only feasible with "Fuel Use Exempt."




## X Option: “Polymer-Only”

"Polymer-Only" closely resembles the "Fuel-Use-Excluded" approach, but it confines allocation exclusively to polymer products. This ensures that chemically recycled feedstocks obtained from plastic waste are exclusively employed in plastic products. However, due to the necessity of transitioning all chemical products, such as pharmaceuticals, to non-fossil feedstocks (CO2, biomass, etc.), this approach is considered short-sighted. It increases the cost of investments and slows down the transition to a climate-neutral circular economy.




## X Option “Segregated Processes”

If there is no agreement on mass balance approach, the only way to allocate and document recycled contend in chemically recyceled plastics would be to use segregated processes, in small and therefore inefficient production facilities. However, this is neither ecologically nor economically sustainable. Companies will only invest in scaling chemically recycled feedstocks if they have the ability to process fossil and recycled feedstocks together in their already existing facilities.

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