



Chemical recycling: what is the state of play globally?

Janek Vähk, Climate, Energy and Air Pollution Programme Coordinator

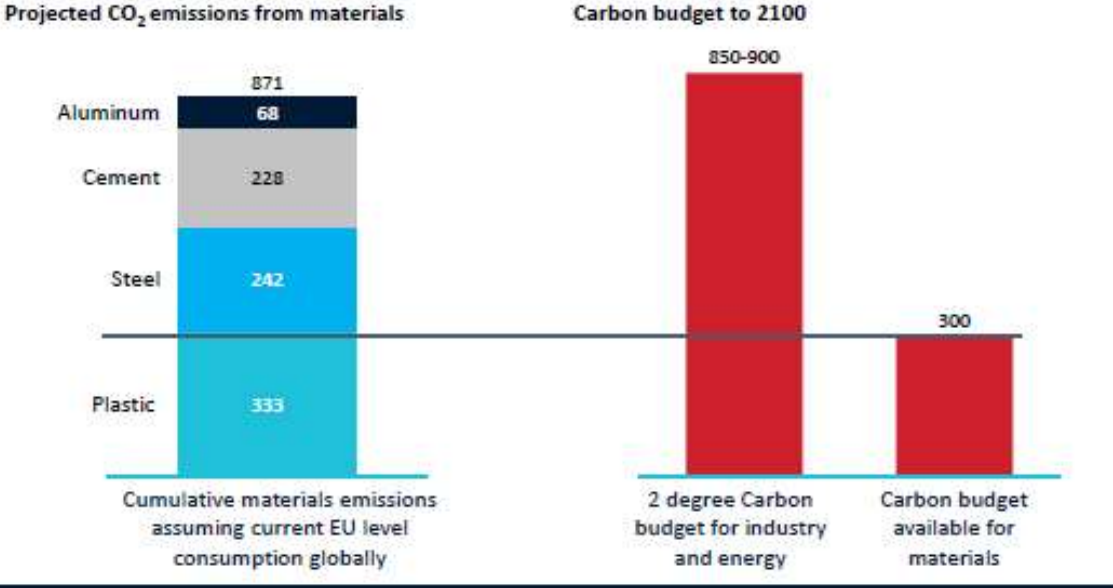
November 24, 2021

janek@zerowasteurope.eu

zerowasteurope.eu

The plastic industry risks using up the remaining carbon budget

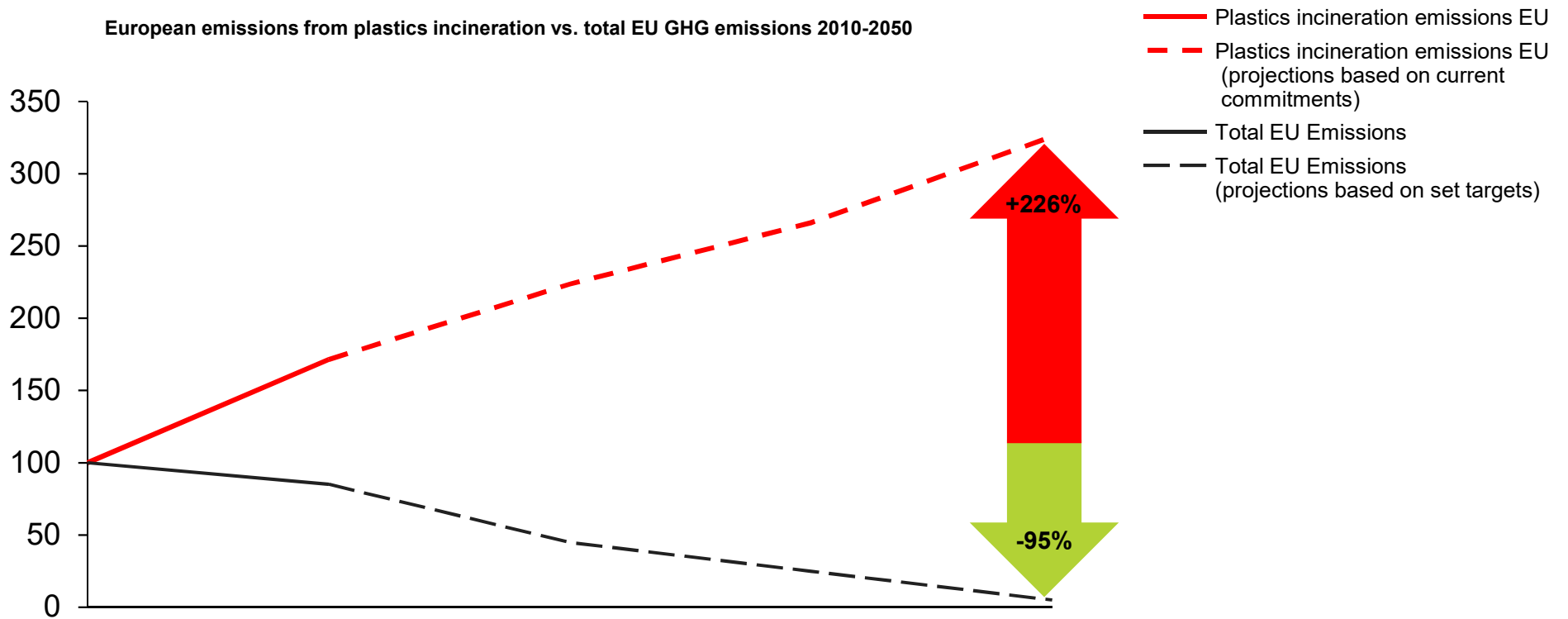
Cumulative emissions to 2100
GtCO₂, global, 2015-2100



Source: Prof. Dr. Martin Stuchtey, Systemiq. Tomra talks. Oct 2021.

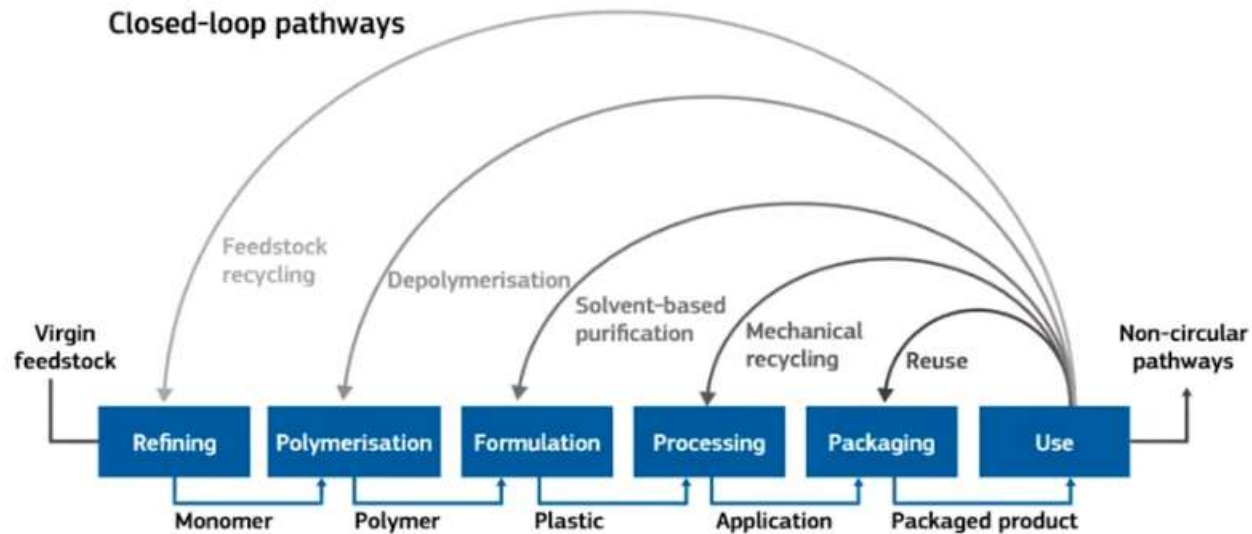
CO2 emissions from plastic incineration doubling

European emissions from plastics incineration vs. total EU GHG emissions 2010-2050

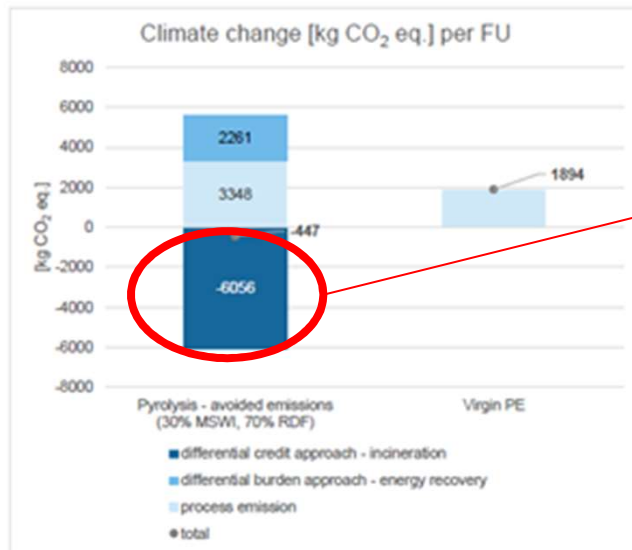


Source: EEA – assuming targets of 55% reduction by 2030 and 95% reduction by 2050 relative to 1990

Keeping the value for as long as possible in a more carbon efficient way



Is 'chemical reprocessing' more carbon efficient than virgin plastic?



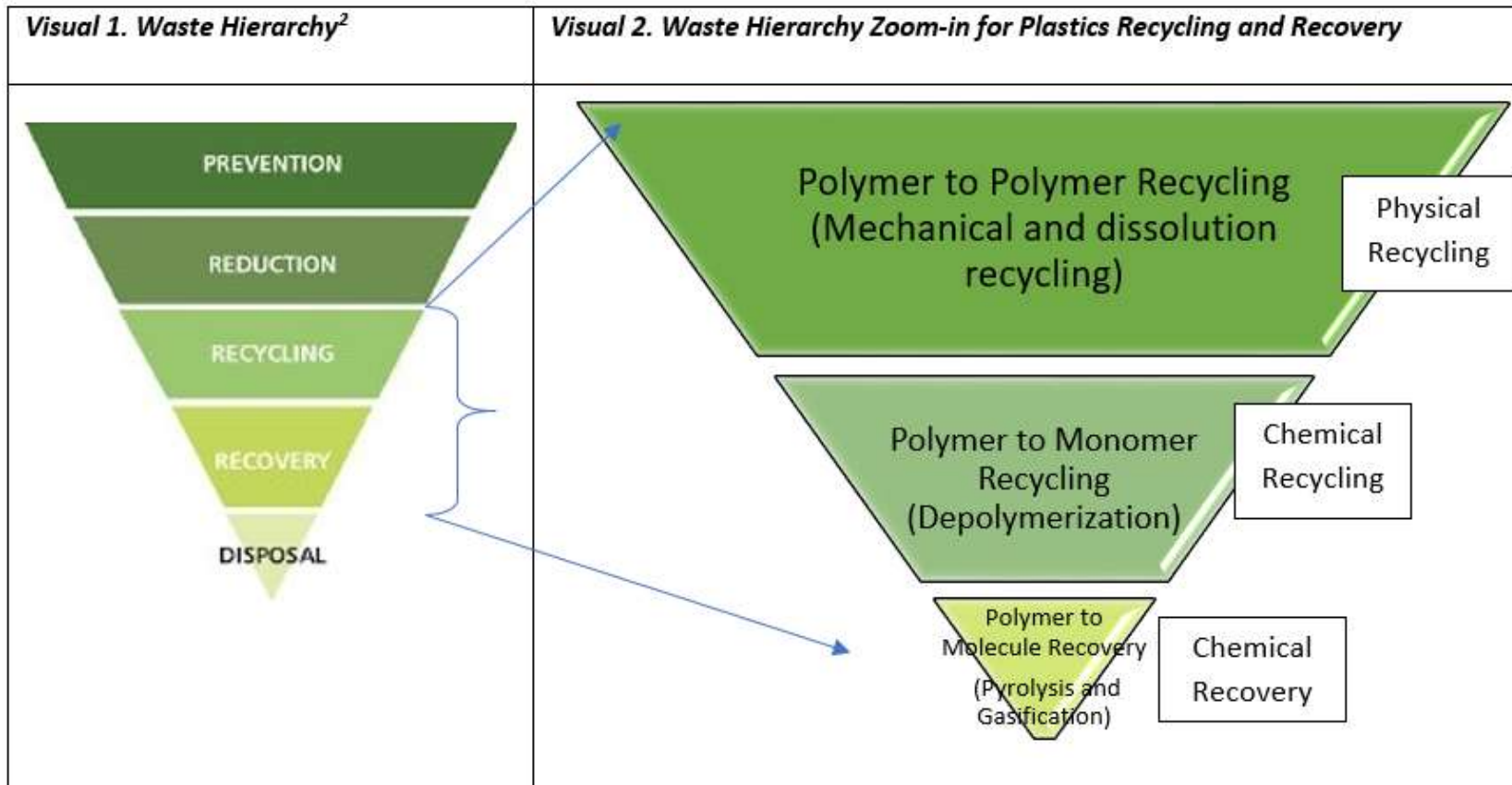
Example: pyrolysis + PE

Only by giving "climate credits" from avoided incineration. If emissions from pyrolysis were transparently reported it would not come out favourably in relation to virgin plastic production.

Energy intensive processes! Despite claims, pyrolysis cannot be self-sustained on energy while also producing plastic feedstock of reasonable yield

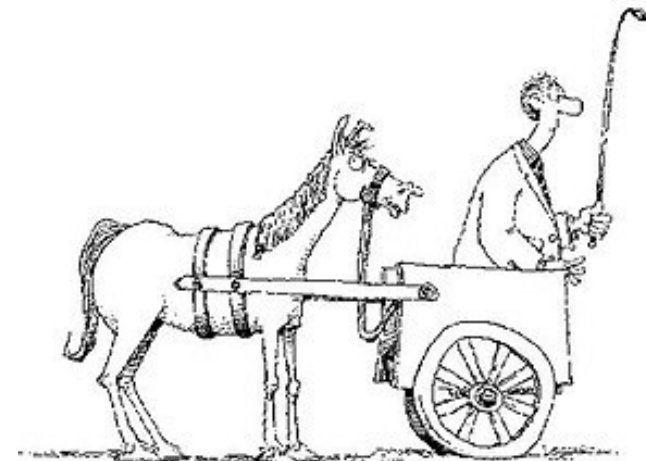
From [LCA study](#) conducted by Sphera Solutions for BASF

Waste hierarchy in the context of plastic value chain



Support upstream innovation, not a high-carbon lock-in situation

- We need to focus on improving the actual recyclability of plastics
- Phase out hard-to-recycle plastics
- Chemical recovery should be the last resort



**Hang on.. I must be doing something wrong..
How does that saying go again?**

What's missing...

- Review waste legislation to introduce definitions of chemical recycling & recovery technologies that exclude fuel production.
- Clarify the legal status of chemical recycling and recovery technologies in the waste hierarchy.
- Develop ambitious standards for determining the actual recycled content in plastics to avoid greenwashing.
- Establish a robust methodology for calculating the climate and environmental impacts of chemical recycling, including all indirect and direct emissions caused by the process.
- Ensure public funds should only support processes with a lower carbon footprint than the production of plastic from virgin feedstock,

- We also need a framework to encourage doing the right thing e.g. carbon pricing of waste incineration (EU ETS).

Read more:

- 7 ways to effectively legislate chemical recycling: https://mk0eeborgicuytuf7e.kinstacdn.com/wp-content/uploads/2020/07/chemical_recycling_statement_2020.pdf
- Understanding environmental impacts of chemical recycling: https://zerowasteurope.eu/wp-content/uploads/2020/12/zwe_jointpaper_UnderstandingEnvironmentalImpactsofCR_en.pdf
- Determining recycled content with the 'mass balance approach': https://zerowasteurope.eu/wp-content/uploads/2021/02/2021_zwe_joint-paper_recycling_content_mass_balance_approach.pdf
- Designing for real recycling, not plastic lock-in: <https://zerowasteurope.eu/library/designing-for-real-recycling-not-plastic-lock-in/>
- **NEW - Briefing on Chemical Recycling & Recovery (to be published in December)**



Understanding the Environmental Impacts of
Chemical Recycling
Ten concerns with existing life cycle assessments
December 2020



Designing for real recycling,
not plastic lock-in
Position Paper - July 2021





Thank you!

Janek Vähk-
janek@zerowasteurope.eu

zerowasteurope.eu