

# Benefits and risks of new polymers in the current and future recycling system

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# Questions raised by new plastics

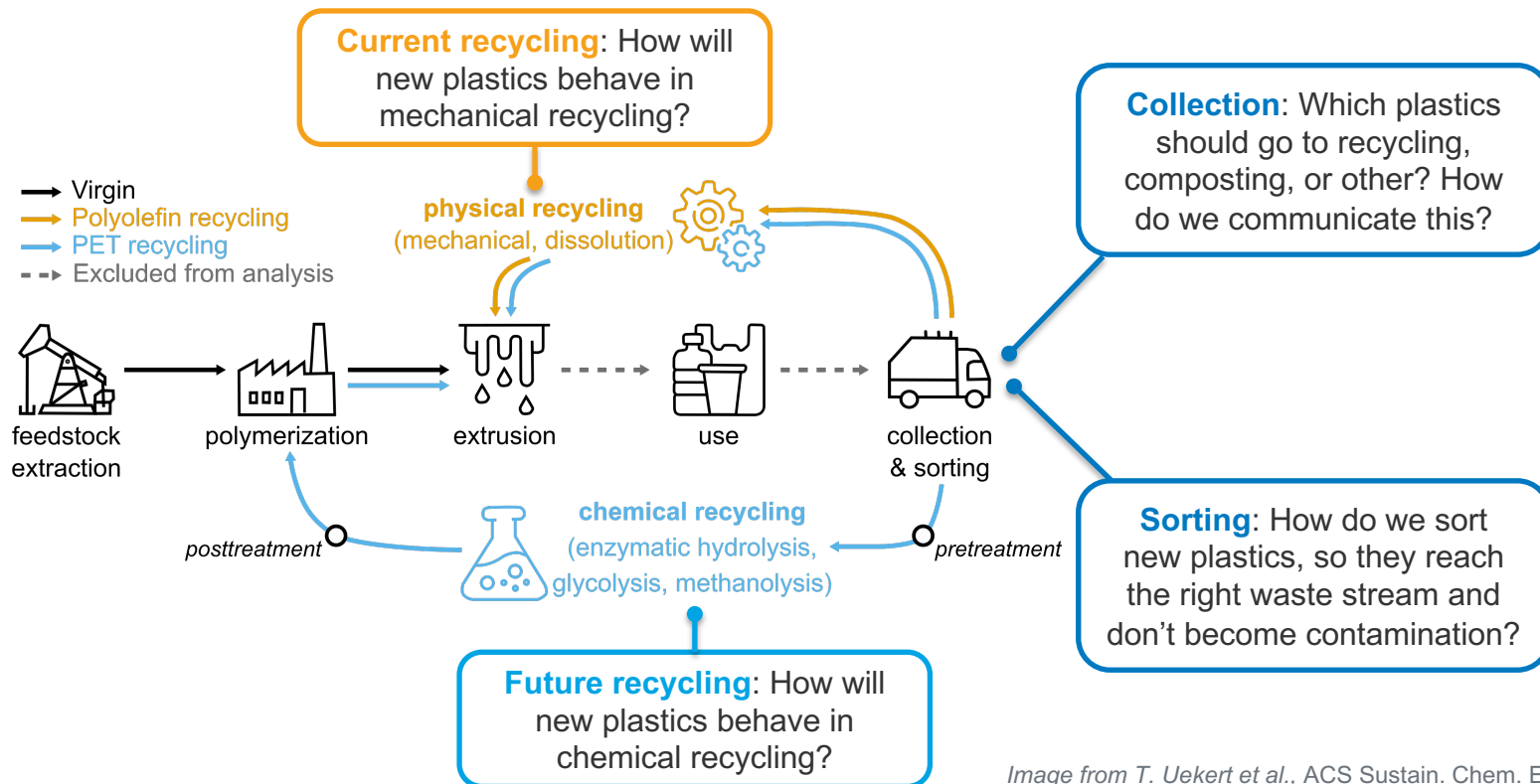
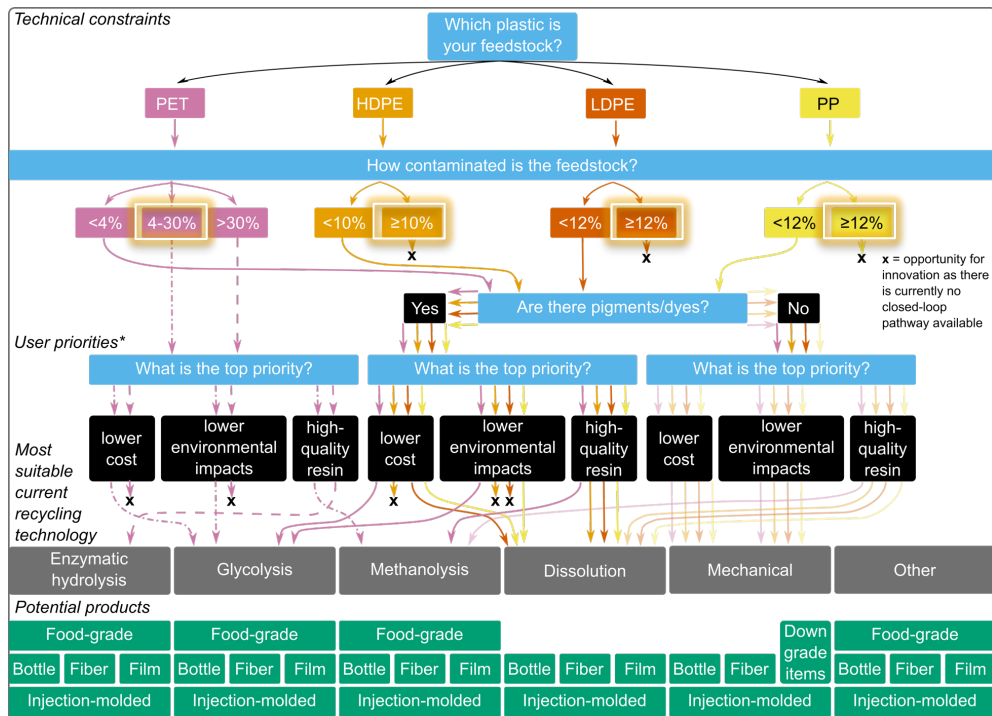
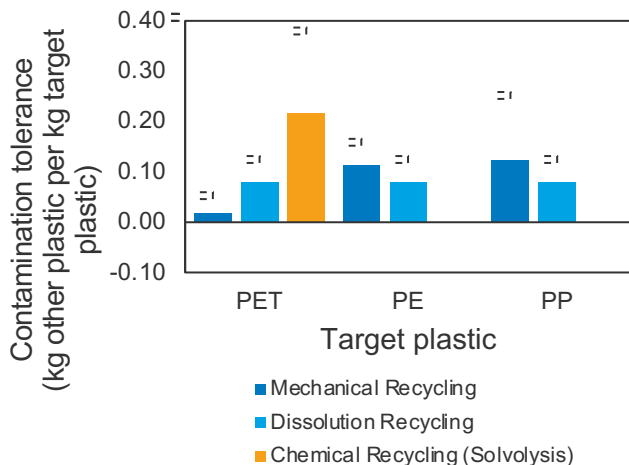


Image from T. Uekert et al., ACS Sustain. Chem. Eng., 2023, 11, 965-978.

# Contamination risks in the current recycling system

- Mechanical recycling can tolerate 1-12% contamination with non-target plastics
- New plastics could exacerbate contamination issues for mechanical recycling



Data and figure from T. Uekert et al., ACS Sustain. Chem. Eng., 2023, 11, 965-978.

# Reducing contamination in the current recycling system

- Cart tagging (informing households whether they put the right or wrong materials in their recycling bin) could reduce contamination by up to 10% from baseline values of 8-26%

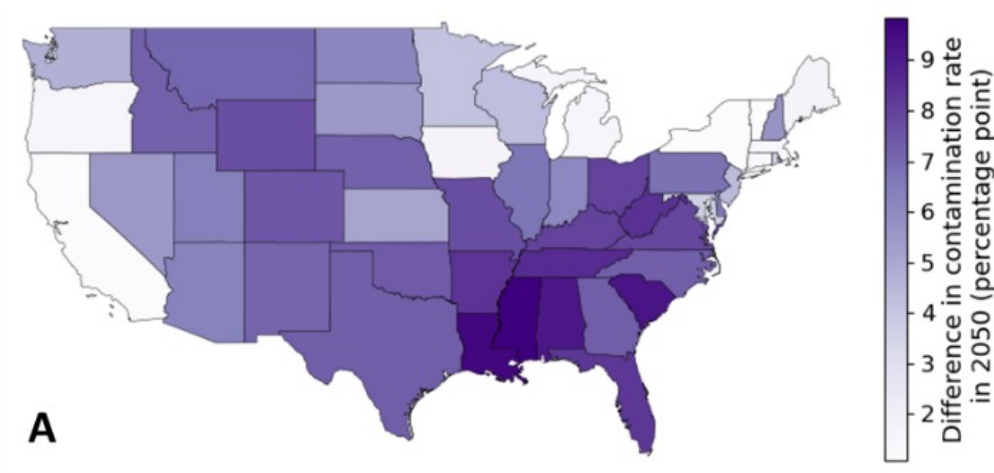
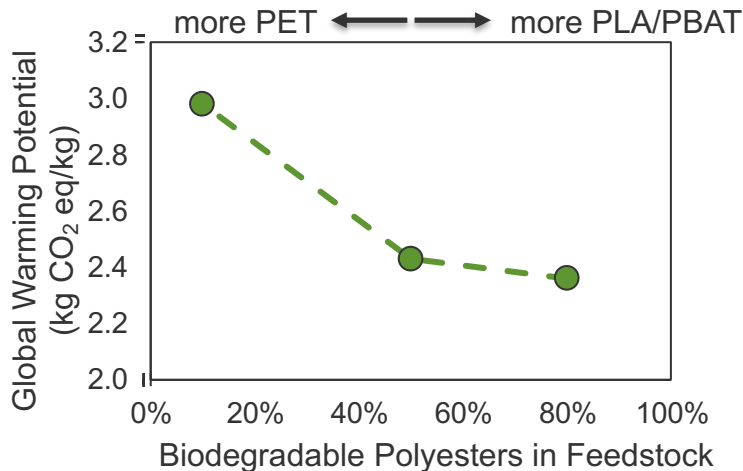
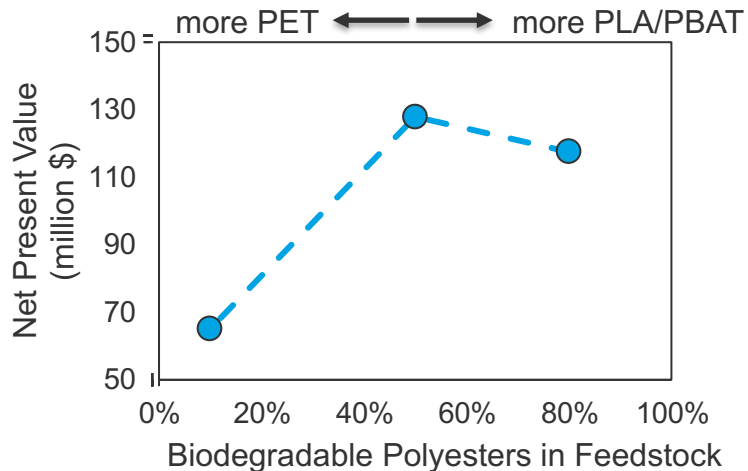


Image from J. Walzberg et al., Energy Res. Soc. Sci. **2023**, 100, 103116

# New plastics could benefit the future recycling system

- Chemical recycling (methanolysis) of mixed polyesters → economic and environmental benefits when feedstock contains more polylactic acid (PLA) and polybutylene adipate terephthalate (PBAT) than polyethylene terephthalate (PET).



A satellite view of Earth at night, showing the curvature of the planet and the glowing lights of cities and continents. The sun is visible on the left horizon, creating a bright glow and lens flare.

# Thank you!

[www.nrel.gov](http://www.nrel.gov)

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