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# FRAUNHOFER CLUSTER OF EXCELLENCE

## CIRCULAR PLASTICS ECONOMY CCPE

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compact 1/2021  
MS Teams-Meeting  
17 February 2021



17 February 2021

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# Highlights of Fraunhofer IVV CreaSolv®process

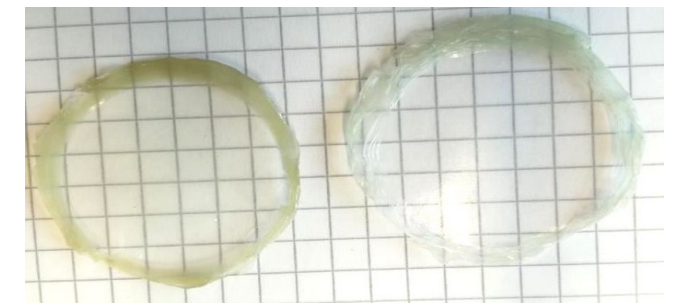
Post-consumer PLA waste

- PLA (73.54%)
- paper, printing inks, dirt, dust, adhesive (22.6%)
- foreign polymers (5% PO, 1.3% PET)
  
- Selective compared with other packaging plastics (PET, PO, PS, PA)
- No → less degradation during the process
  
- Cleaning efficiency test of industrial PLA waste

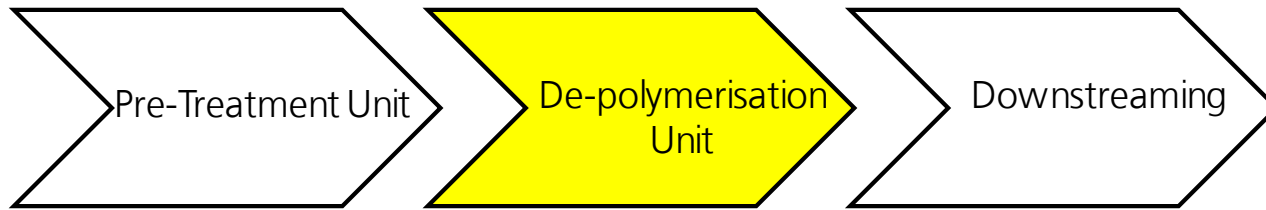
Good cleaning potential:

Toluene, Chlorobenzene, Chloroform, Methylsalicylate

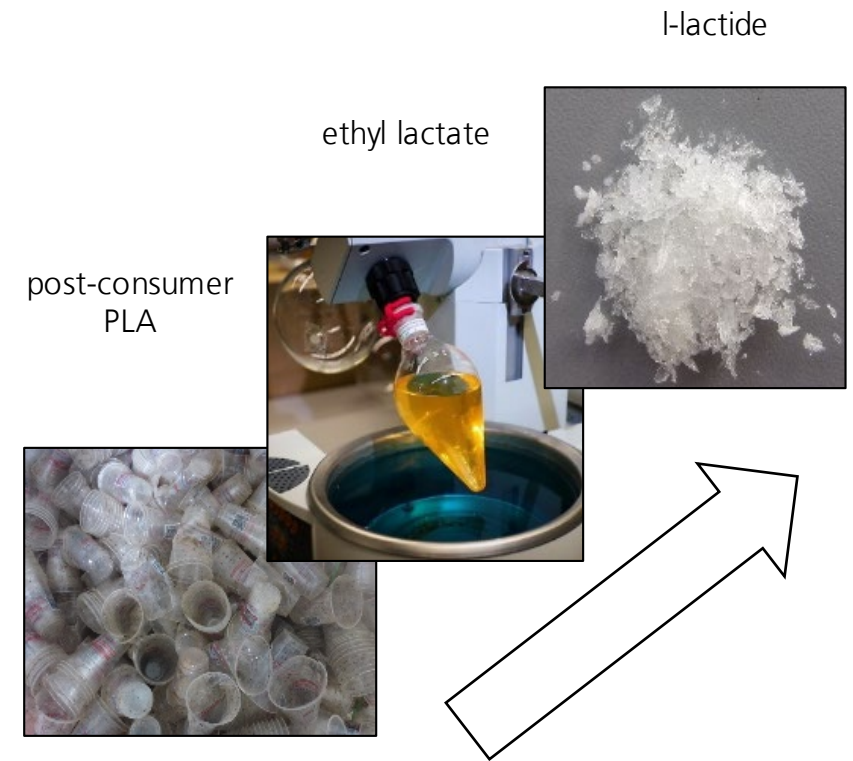
Phenylcyclohexane, Methylstearate → Benzophenone



# Highlights of Fraunhofer ICT Solvolysis Process



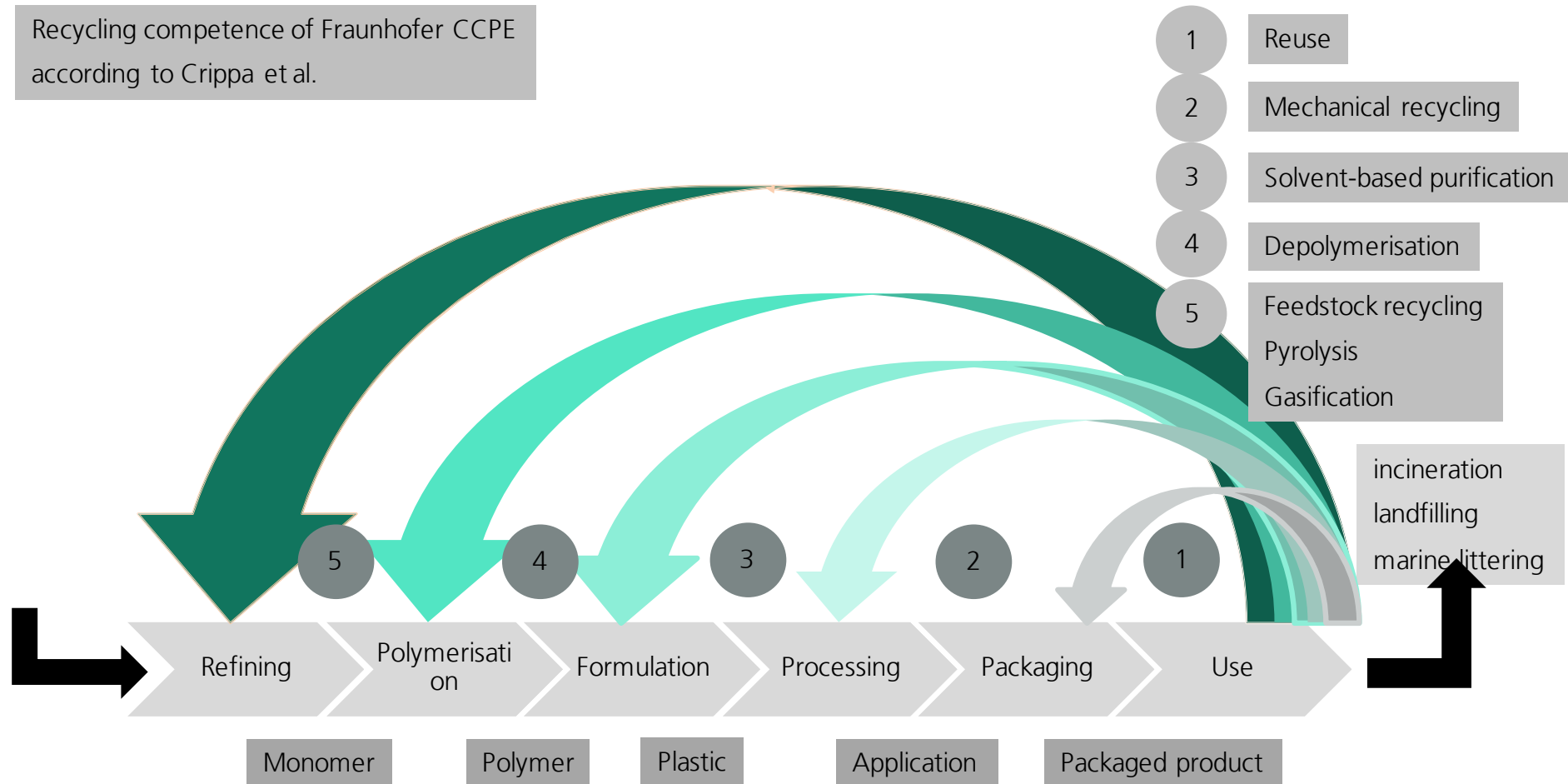
- reaction conditions are **mild** ( $t_{\text{reaction}} < 30$  mins;  $T < 70^{\circ}\text{C}$ ; ambient pressure); rendering it **scalable** for **continuous production**
- use of an **aprotic, green, low-boiling solvent**, capable of **selectively dissolving the PLA fraction** from a mixed, plastic waste stream.
- process is **flexible and robust**, i.e.: capable of handling a range of PLA grades without affecting the **yield of ethyl lactate (> 80%)**
- conserves valuable biogenic feedstock by creating an **alternative potential feedstock** for **carbon-negative production of ethyl lactate**



# Conclusion

## Recycling technologies for PLA

Recycling competence of Fraunhofer CCPE according to Crippa et al.



[Crippa-2019]

# THANK YOU FOR YOUR ATTENTION

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# Sources

## Sample: How we decided to cite

[Kurnatowski-2017] von Kurnatowski, M.; Bortz, M.; Scherrer, A.; Hoffmann, A.; Lorenz, H.-M.; Caraucan, M.; Grützner, T.; Künzle, N.; Küfer, K.-H. (2017): Multi-criteria Optimization of an Industrial World-Scale Process, Chem. Ing. Tech. 89(11), pp. 1471–1478, doi: 10.1002/cite.201700016

[Crippa2019] Crippa, M.; De Wilde, B.; Koopmans, R.; Leyssens, J.; Linder, M.; Muncke, J.; Ritschkoff, A.-C.; Van Doorselaer, K.; Velis, C. & Wagner, M. (2019): A circular economy for plastics: Insights from research and innovation to inform policy and funding decisions, European Commission, doi: 10.2777/269031

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