Circular Materials Conference 2025
Copenhagen, 15/10/2025

Probabilistic Plastics Flow Analysis of WEEE in Europe

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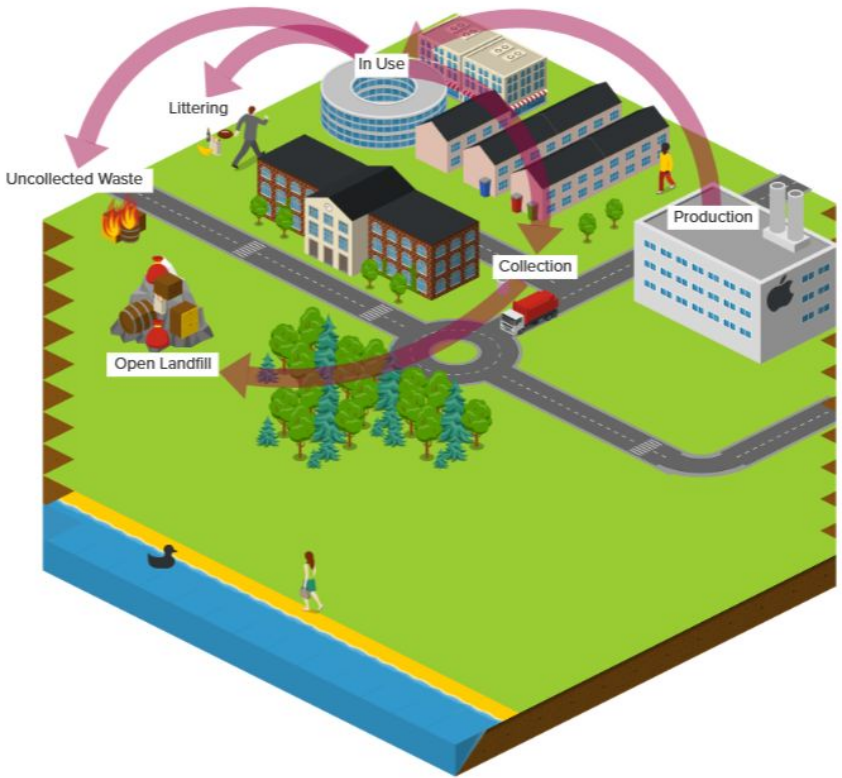
Introduction

EU Policy and the History of Plastics

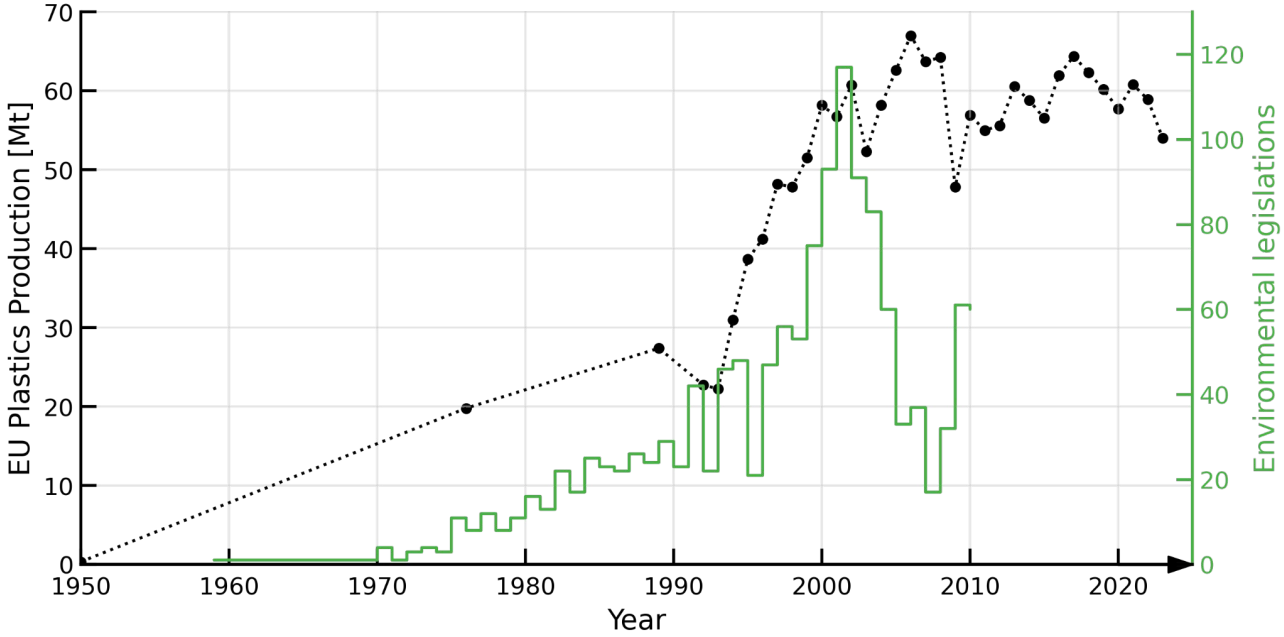
The Beginning (sometime after WWII)

- Appr. 350kt of plastics in primary form were produced in Europe in 1950
- Widespread landfills of mixed and hazardous wastes
- Incineration was unpopular due to costs and pollution



EU Policy and the History of Plastics

Retrospective Plastic Flow Modelling



EU Policy and the History of Plastics

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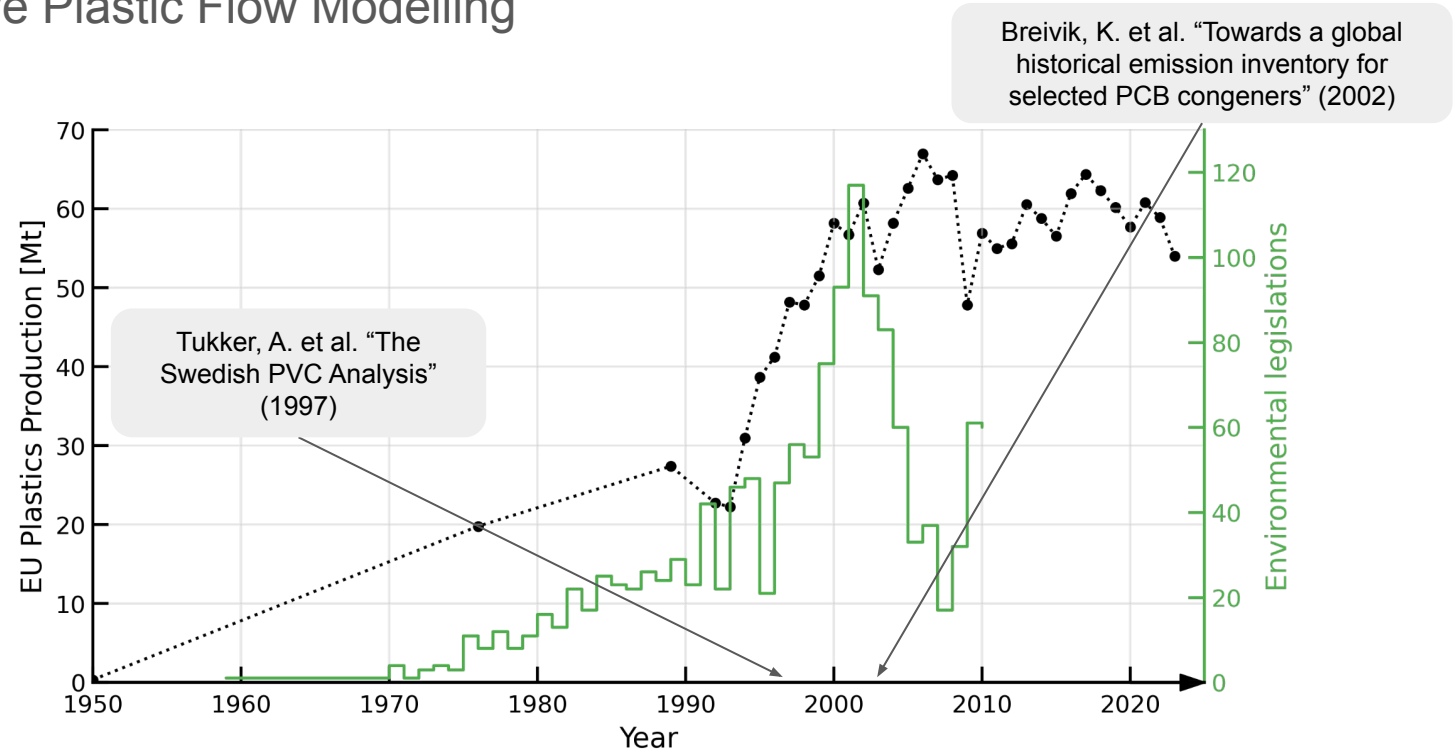
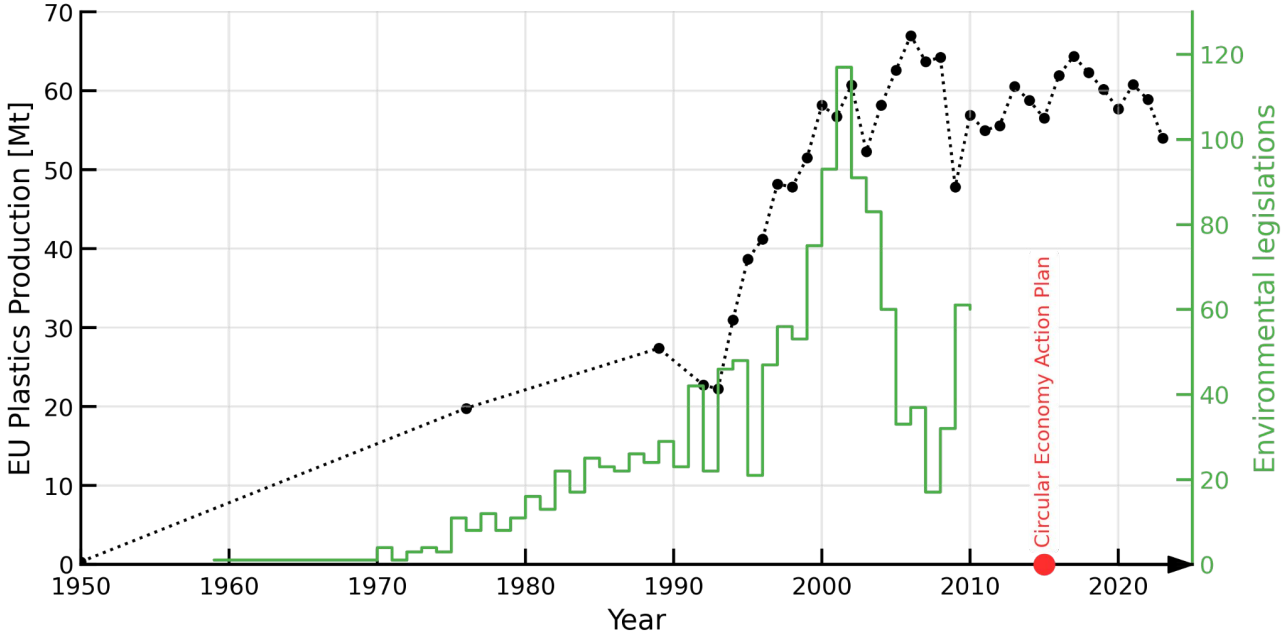


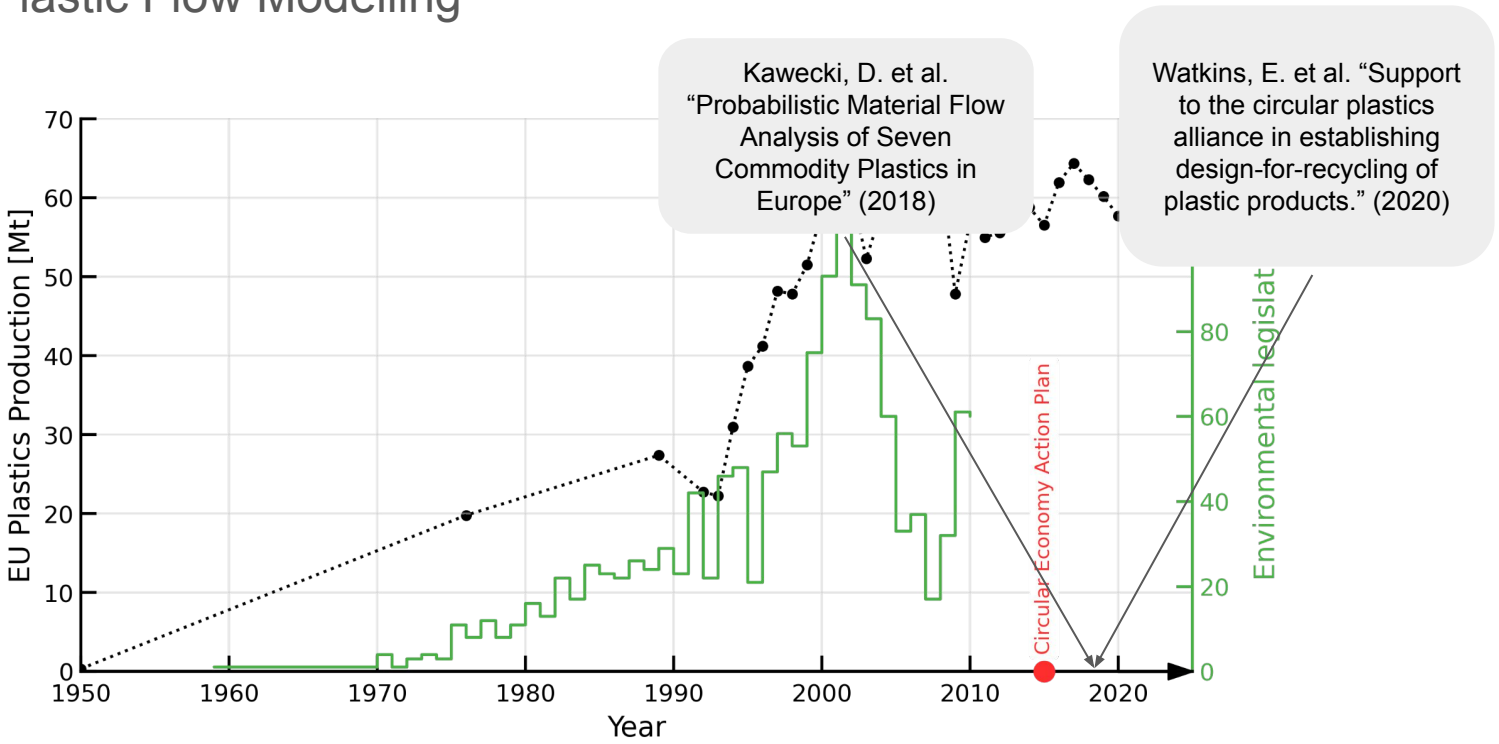
EU Policy and the History of Plastics

Prospective Plastic Flow Modelling



EU Policy and the History of Plastics

Prospective Plastic Flow Modelling



Research Question

What is the uncertainty of WEEE generation based on the intrinsic variance of EEE products?

Data & Method

What is a Product?

Reality

What is a Product?

Reality

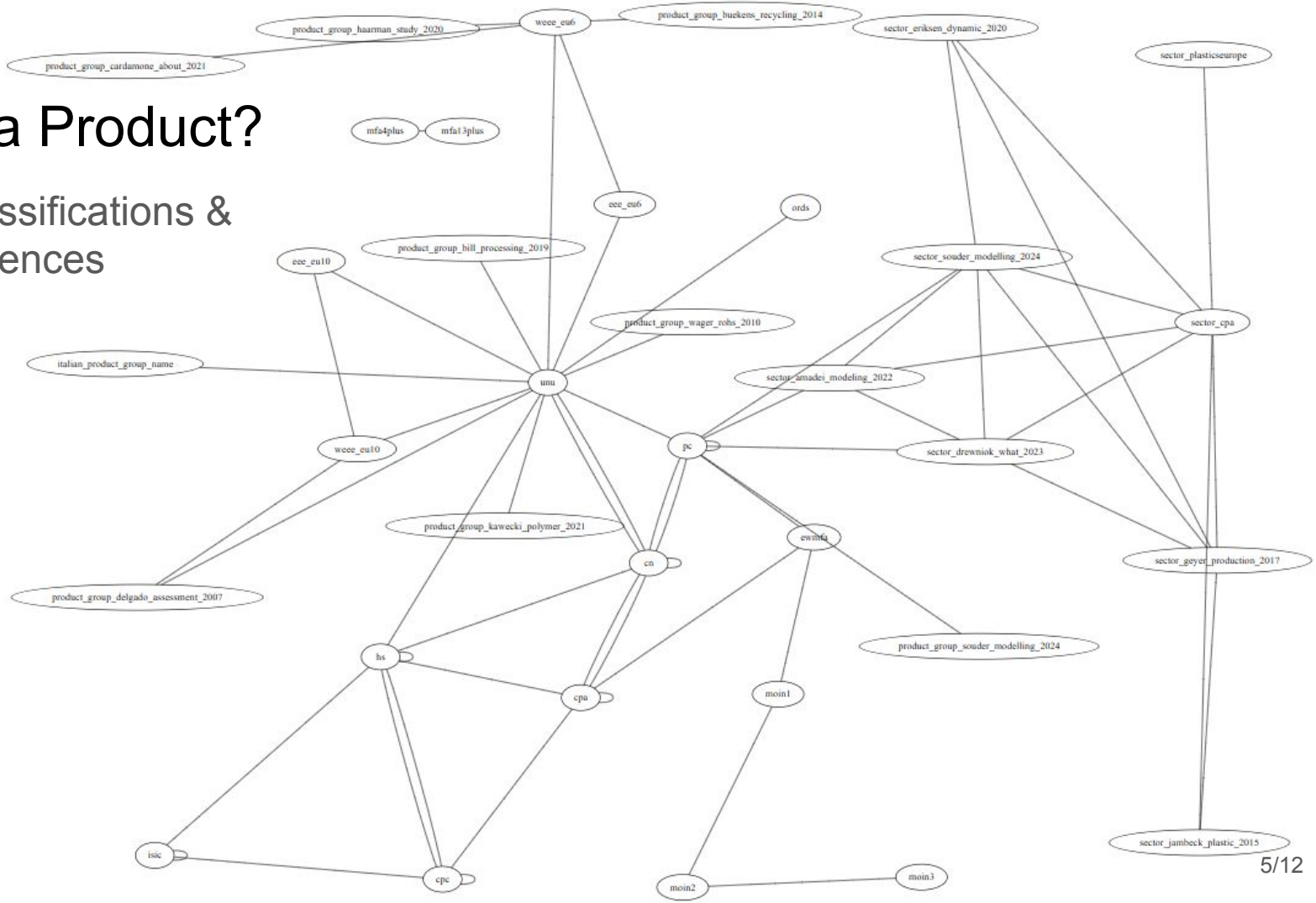
Classification

Simulation

System	Prodcom (2025)
ID	22221450
Name	Plastic carboys, bottles, flasks and similar articles for the conveyance or packing of goods, of a capacity =< 2 litres

What is a Product?

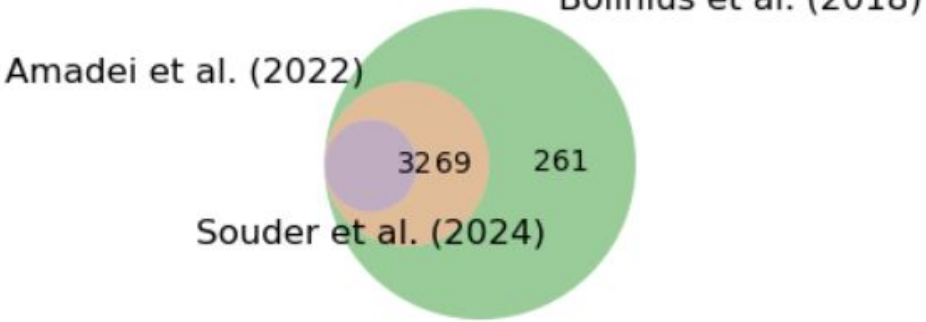
Product Classifications & Correspondences

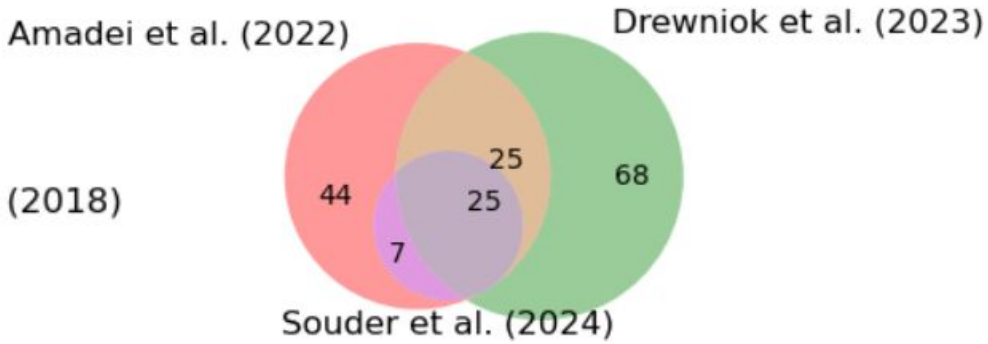


What is a Plastics containing EEE Product?

System	Prodcom (2025)
ID	27512530
Name	Manufacture of electric domestic appliances / Electric instantaneous water heaters

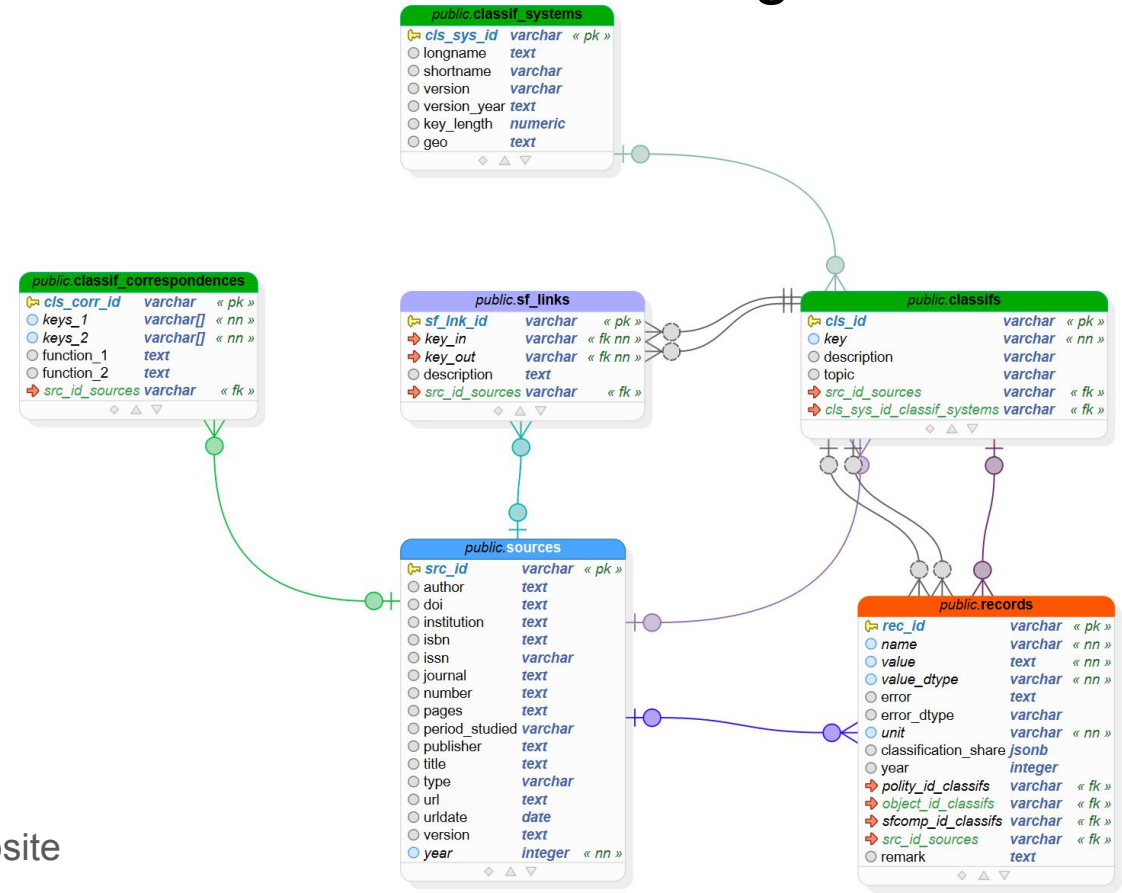
What is a Plastics containing EEE Product?





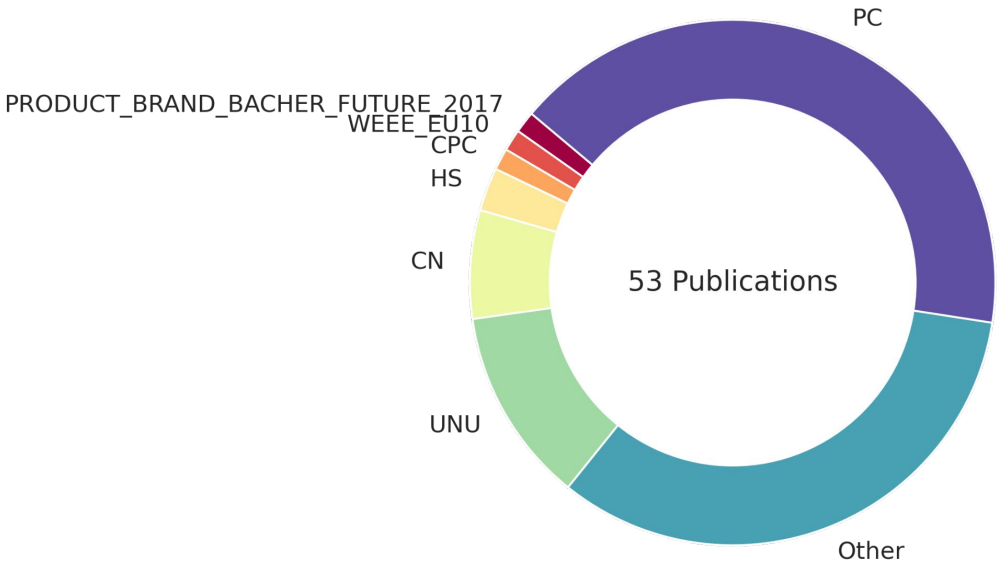
Nr of Prodcom products classified into EEE

Database for Plastics Flow Modelling



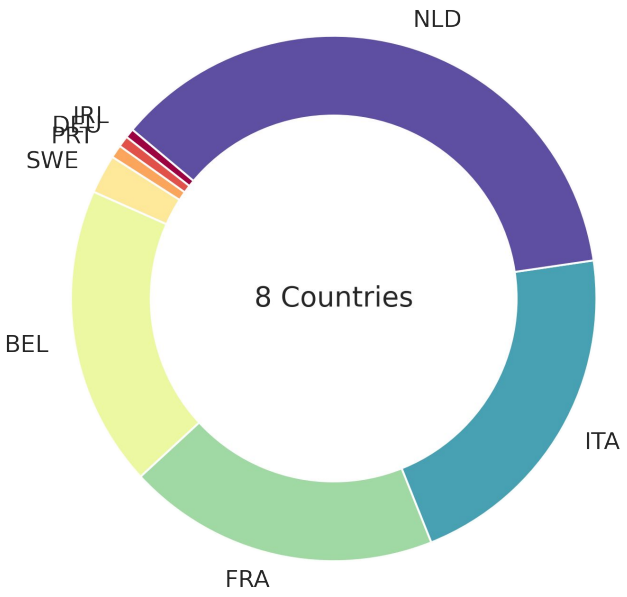
Link to database website

Database for Plastics Flow Modelling



Nr of sources per product classification

Database for Plastics Flow Modelling



Nr of product attribute estimates per country.

Results

Results

EEE Products Attribute Comparison

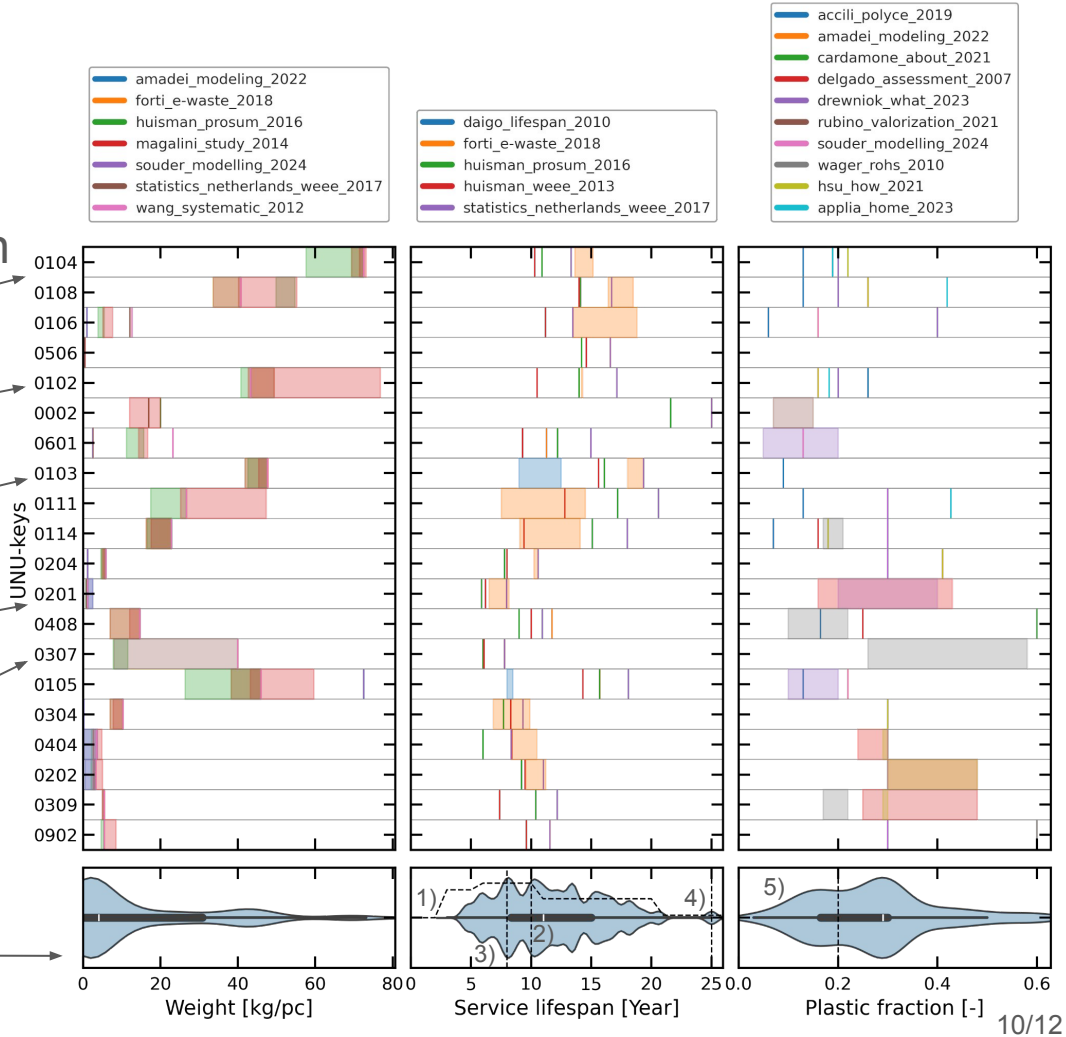
Washing Machines

Dishwashers

Kitchen (f.i. large furnaces, ovens, cooking equipment)

Other Small Household (e.g., small ventilators, irons, clocks, adapters)

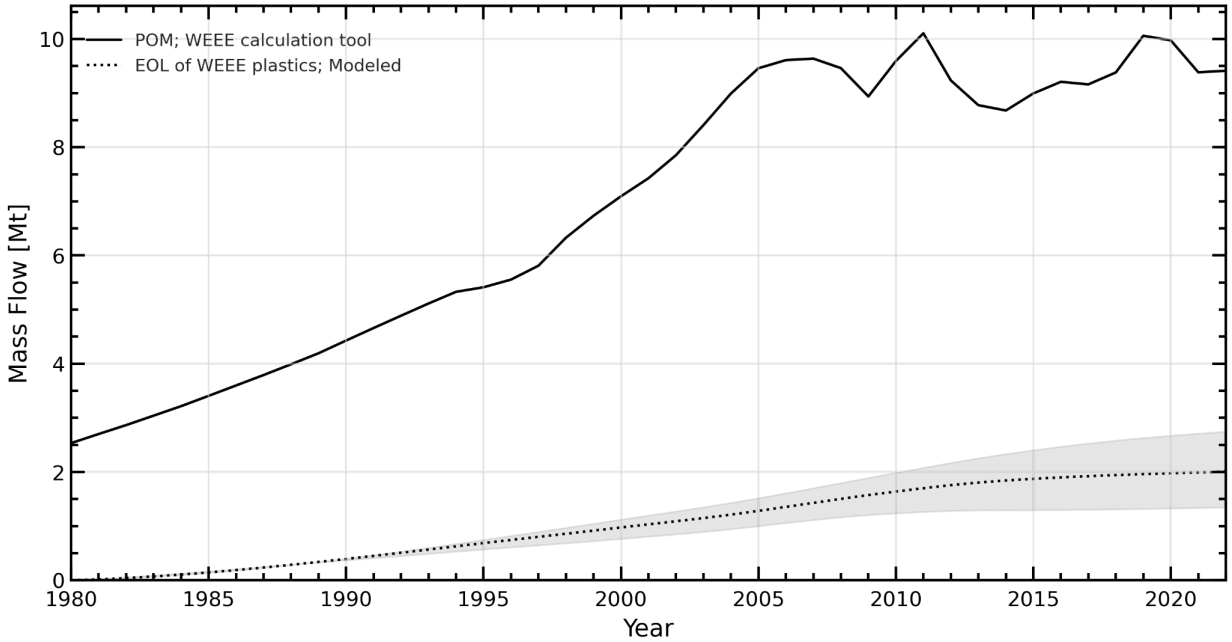
Professional IT (f.i. servers, routers, data storage, copiers)



1) Kawecki, D., et al. (2021)
2) Ciacci, L., et al. (2017)
3) Eriksen, M.K., et al. (2020)
4) Bolinius, J.D., et al. (2018)
5) Raudaskoski, A., et al. (2019)

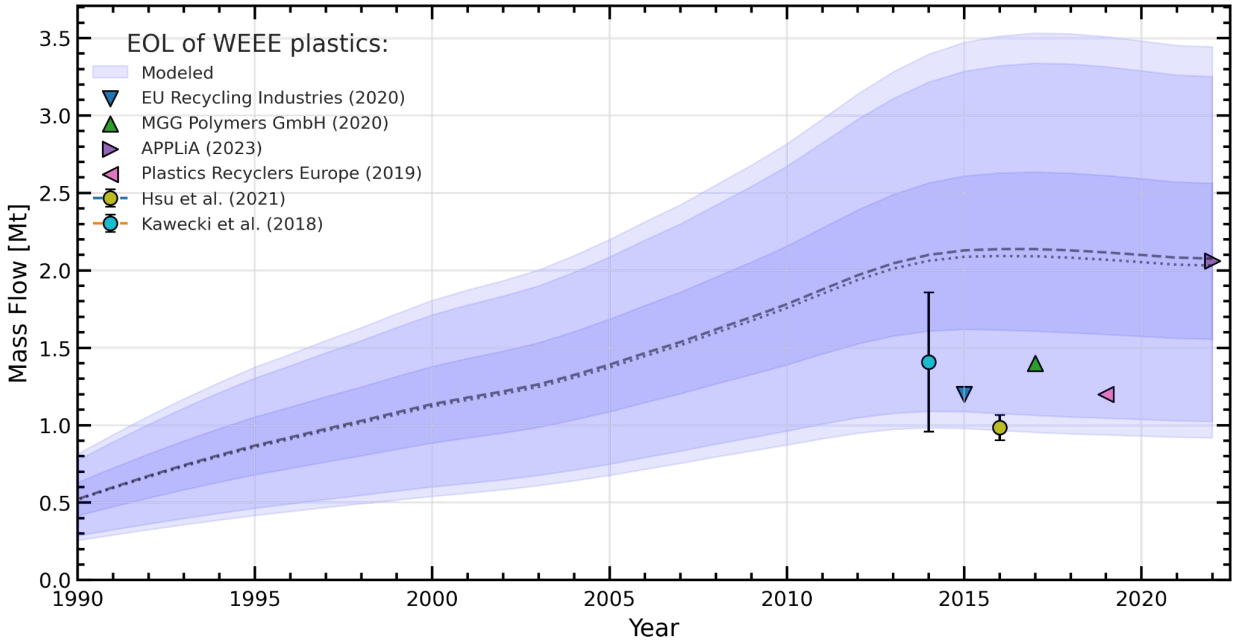
Results

EEE products Put-on-Market (POM) and End-of-Life (EOL) flows



Results

Plastics in EEE products reaching End-of-Life (EOL)



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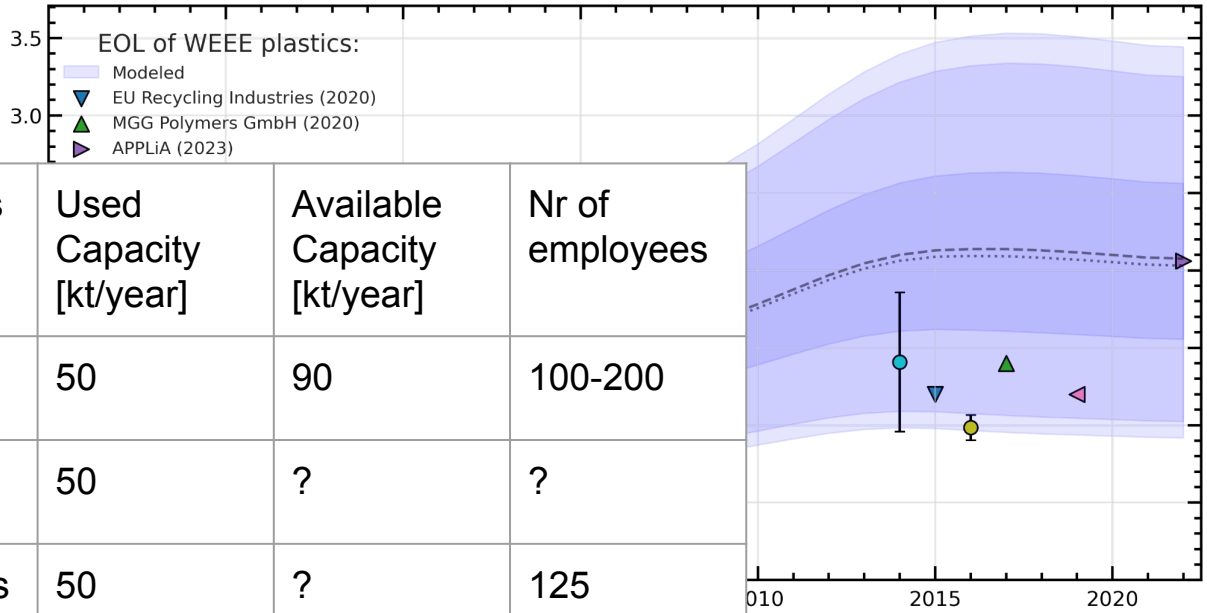
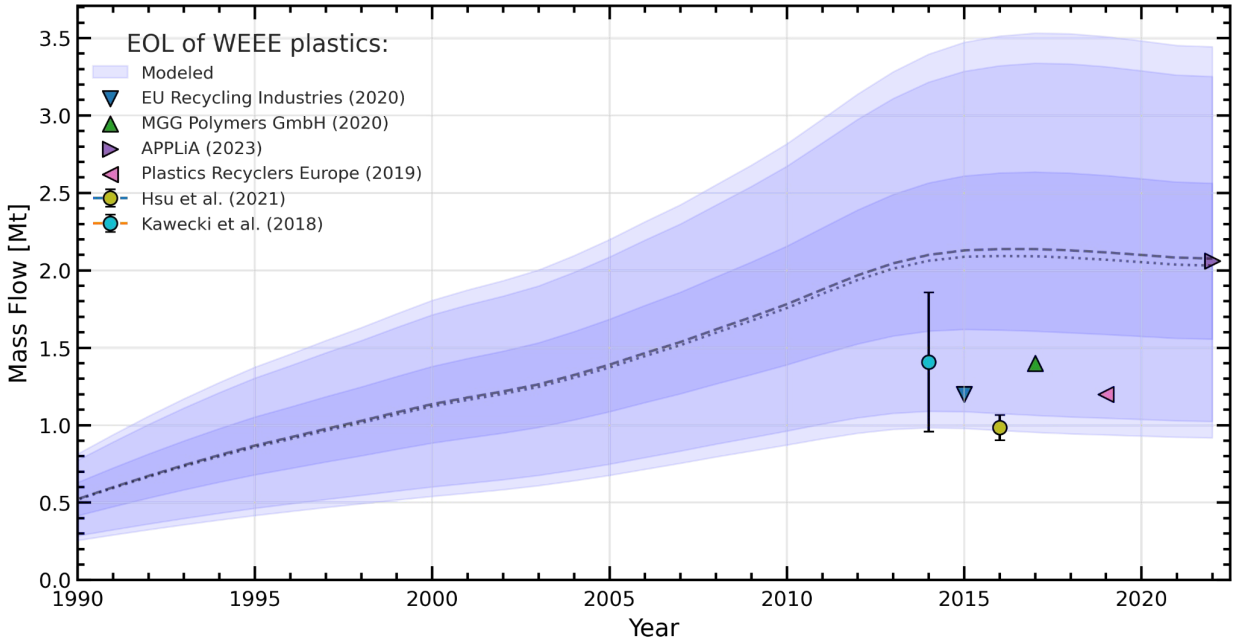


WEEE Plastics Recyclers	Used Capacity [kt/year]	Available Capacity [kt/year]	Nr of employees
Galloo Plastics	50	90	100-200
Renewi	50	?	?
MGG Polymers GmbH	50	?	125

Results

Plastics in EEE products reaching End-of-Life (EOL)



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materialflows-dashboard.vito.be

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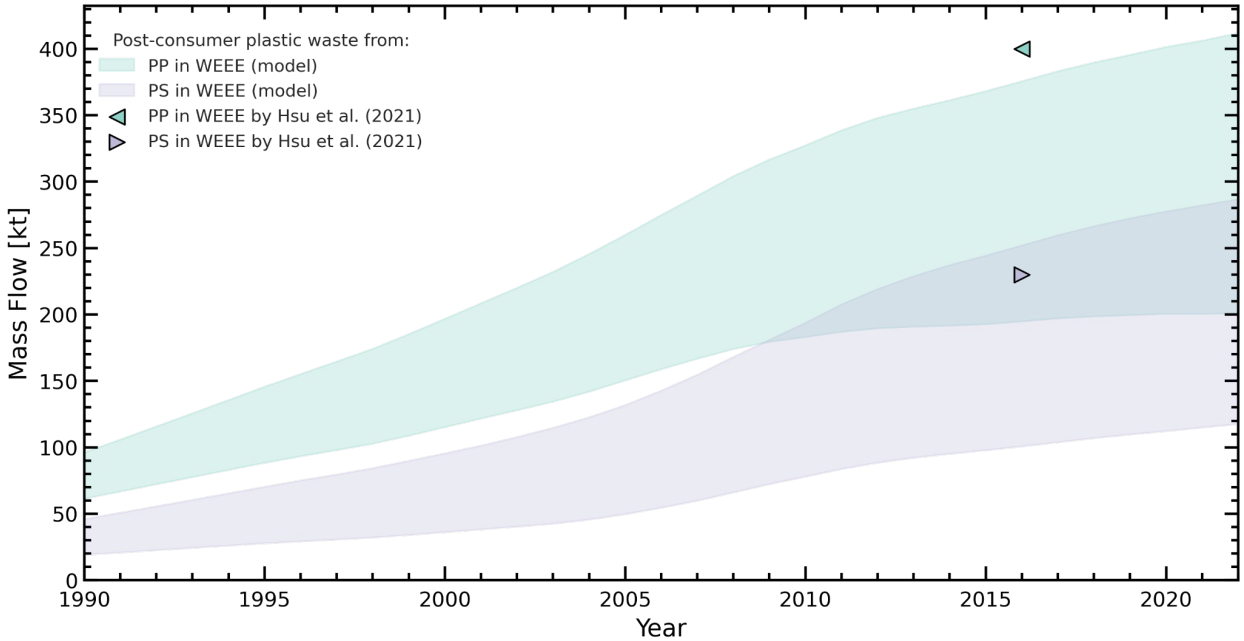
Results

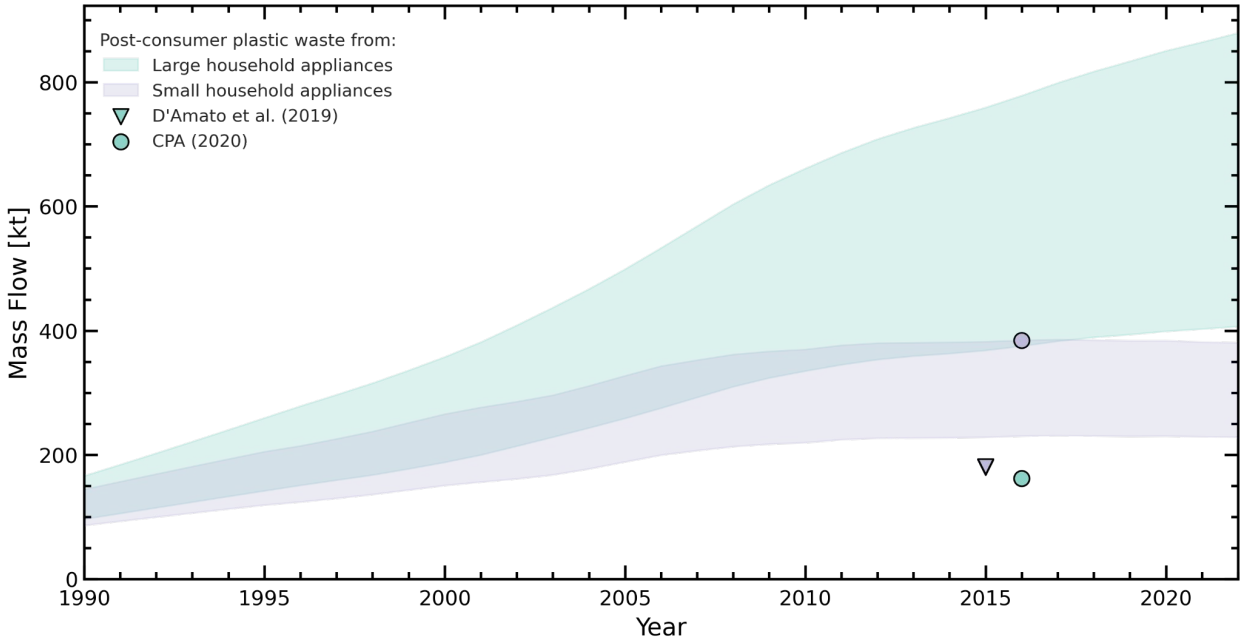
in post-consumer EEE waste



*Based on put-on-market quantities used by the `WEEE calculation tool` which is published through the European Commission.

Results

Plastics in Waste of Large and Small Household Appliances



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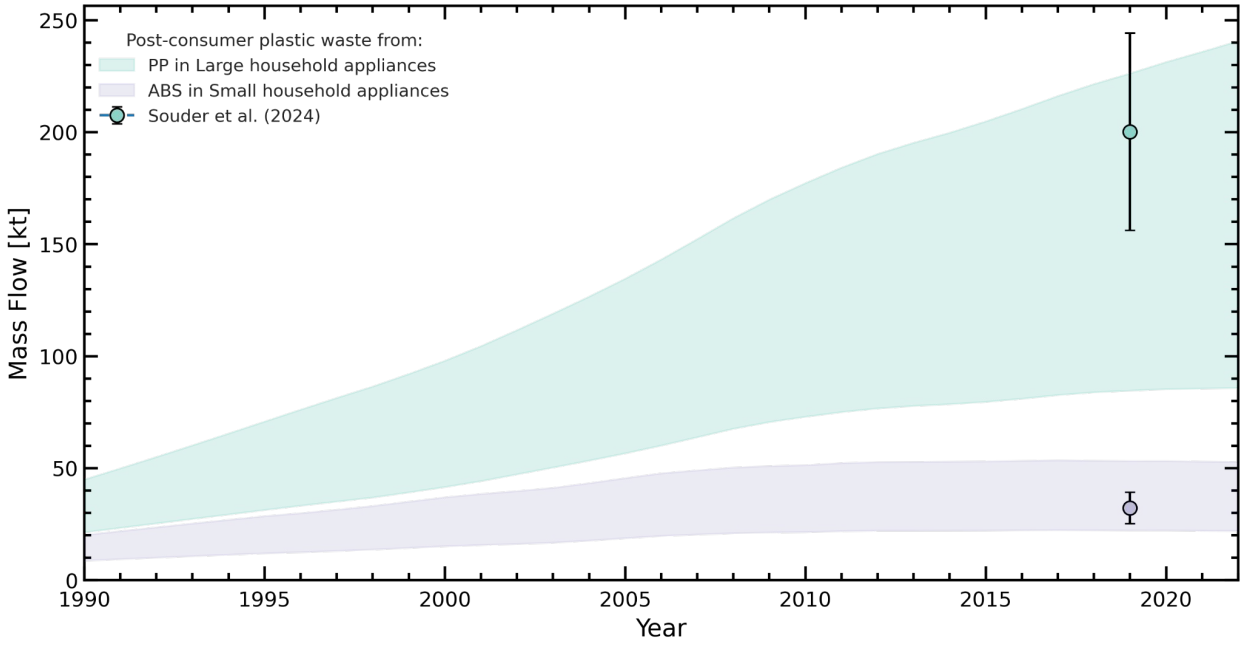
Results

PP and ABS in Waste of Large and Small Household Appliances



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