



# Evaluating environmental policies with citizen science data?

An example from the Plastic Pirates investigating plastic  
pollution of rivers

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**Global plastic pollution endangers planetary health, with devastating impacts on ecosystems, wildlife, and human health.**



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## Plastic Pirates – Go Europe!

a European Citizen Science campaign, in which school classes and youth groups collect plastic samples from streams and rivers and document their findings

Plastic Pirates litter data included in the study:

- ▶ five sampling campaigns 2019–2021
- ▶ > 8,000 schoolchildren and other participants
- ▶ > 350 schools and youth organisations



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# Methodology – Litter data

## Data sources for litter at riversides and coastlines

- ▶ Verified Plastics Pirates data for German rivers
- ▶ Data from three sampling protocols of coastlines:



European  
Environment  
Agency

Marine Litter Watch



International Coastal  
Cleanup



**OSPAR  
COMMISSION**

## Matching litter categories across sampling protocols

- ▶ Large number of existing categories was condensed to 21 categories, focusing on single-use plastics and further commonly occurring litter items of other materials

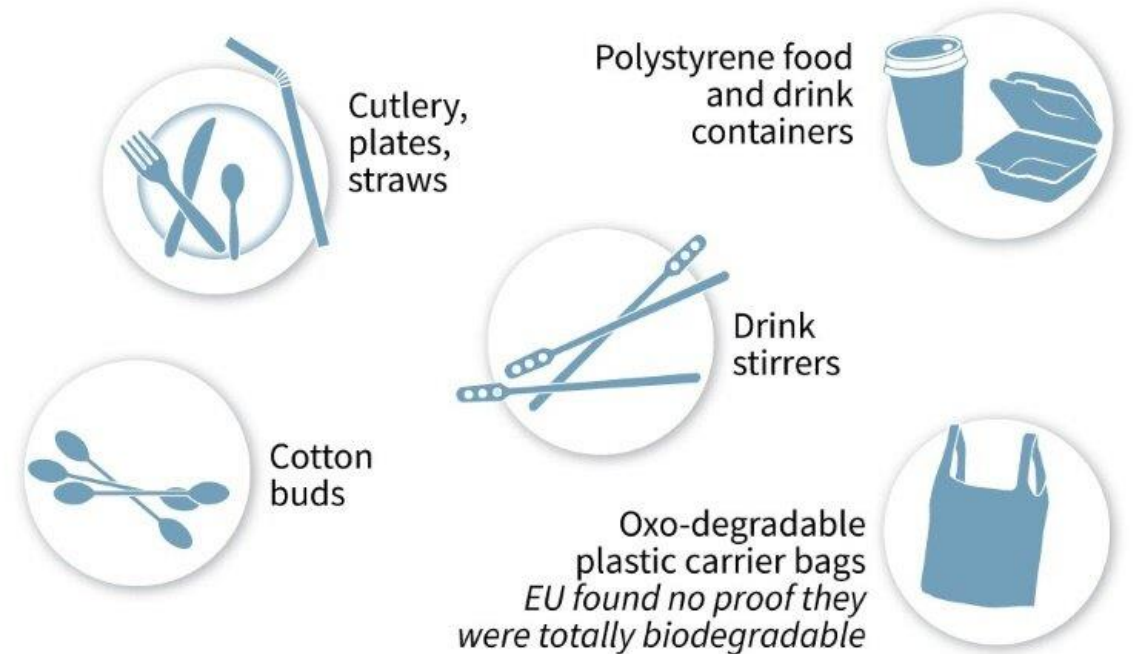
# Methodology – Litter reduction scenarios

## Three scenarios

- ▶ thought experiment based on litter data
- ▶ evolve around policy measures introduced by the EU Single-Use Plastics (SUP) Directive

## EU bans single use-plastics

About ten product categories will be banned, from 2021

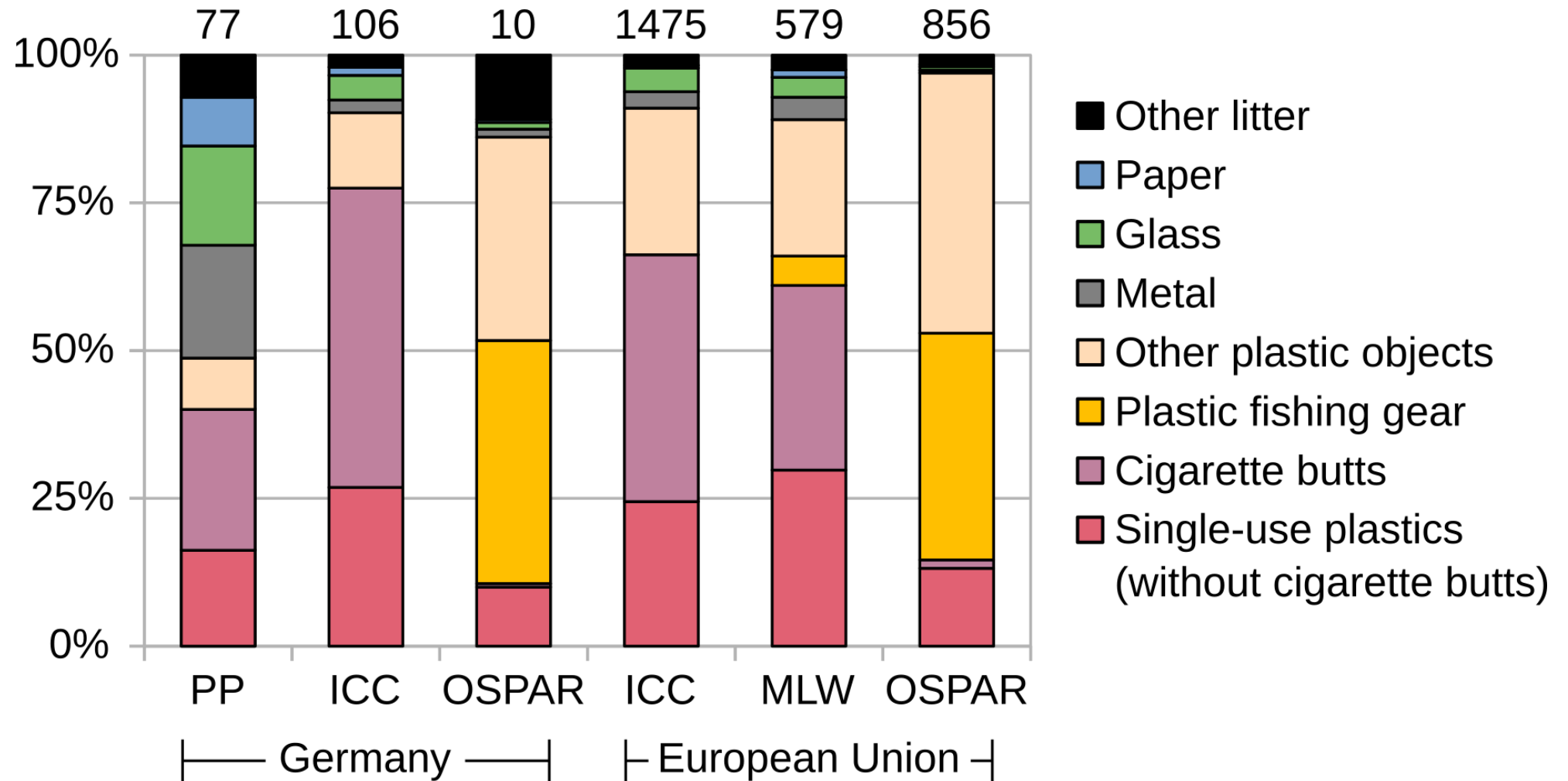


Source: European Commission

# Methodology – Litter reduction scenarios

| % reduction of litter quantities<br>(2019 to 2021)                                       | Scenario: best case | Scenario: moderate<br>improvements | Scenario: only bans |
|--|---------------------|------------------------------------|---------------------|
| Plastic bags   | 100%                | 25%                                | 0%                  |
| Plastic bottles  | 100%                | 25%                                | 0%                  |
| Plastic lids   | 100%                | 50%                                | 0%                  |
| Takeaway and fast food packaging (incl.<br>disposable coffee cups and lids)              | 100%                | 50%                                | 0%                  |
| Plastic cutlery and plastic plates (incl.<br>plastic coffee stirrers and plastic straws) | 100%                | 100%                               | 100%                |
| Plastic packaging for sweets, crisps, etc.   | 100%                | 25%                                | 0%                  |
| Cotton buds with plastic rod   | 100%                | 100%                               | 100%                |
| Wet wipes, tampons and sanitary towels   | 100%                | 25%                                | 0%                  |
| Cigarette butts  | 100%                | 25%                                | 0%                  |
| Balloons   | 100%                | 25%                                | 0%                  |
| Plastic fishing gear   | 100%                | 25%                                | 0%                  |

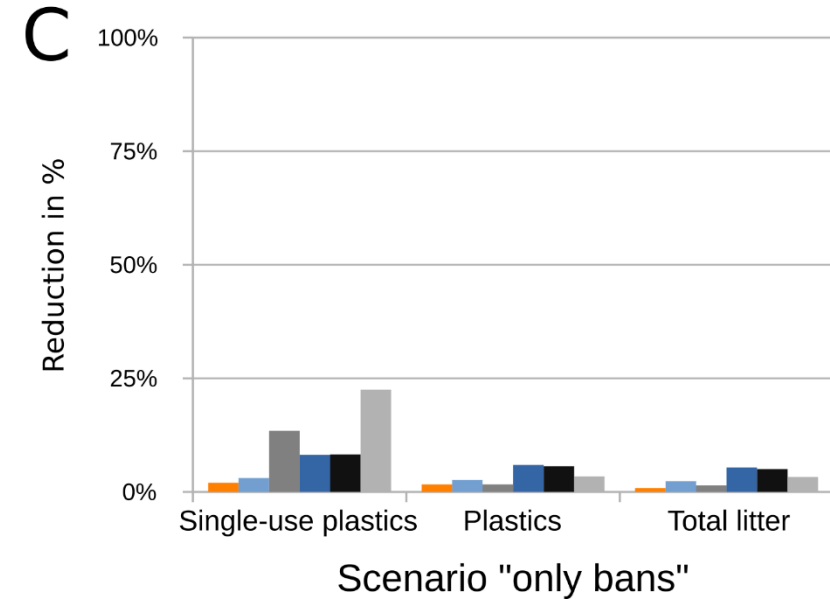
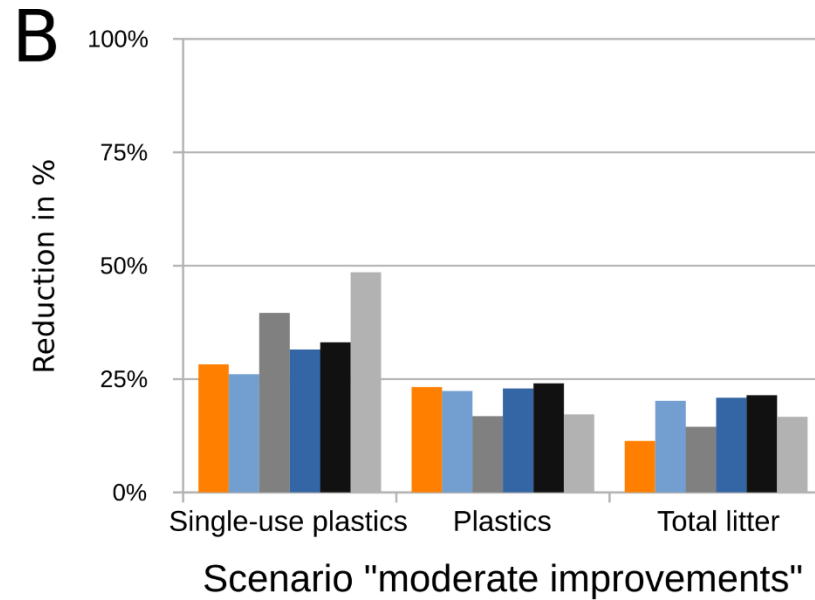
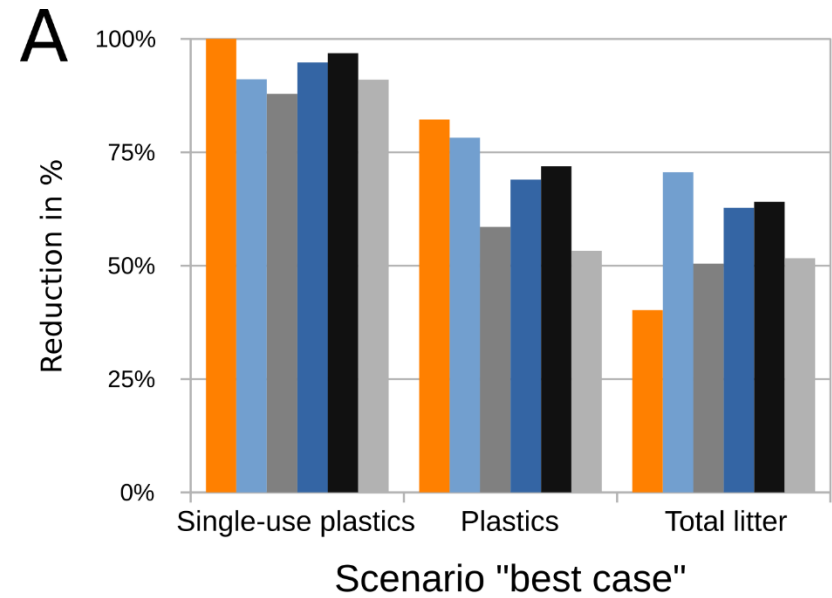
# Litter found at riversides and coastlines



# Results

## Scenario Analysis

- Plastic Pirates Germany
- International Coastal Cleanup Germany
- OSPAR Germany
- International Coastal Cleanup European Union
- Marine Litter Watch European Union
- OSPAR European Union





# Conclusions from Scenario Analysis

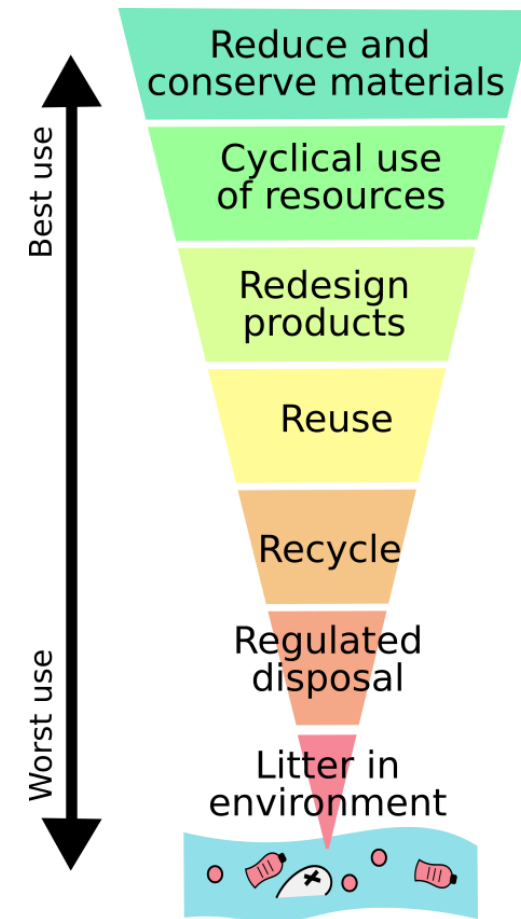
- ▶ the bans included in the SUP Directive are not enough to significantly reduce litter quantities (cf. only bans scenario)
- ▶ instruments addressing litter items that occur in large quantities (e.g. cigarette butts) are crucial, even if they are only partially effective
- ▶ how EU member states implement measures (e.g. regarding EPR and clean-up) is a key element for success

”

**only data originating from citizen science projects covers the spatio-temporal scale necessary to evaluate a large-scale policy instrument such as the SUP Directive**

# Outlook

- ▶ current provisions of the SUP Directive alone are not sufficient to solve the litter problem
  - narrow scope on certain SUP items
  - risks to result in the substitution of SUPs by single-use items made from other materials
- ▶ the EU should align its policies more effectively with the waste hierarchy and truly prioritise waste reduction and re-use options





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# Thanks! Any questions?

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