Cost-benefit analysis of policy measures reducing unintentional release of microplastics

Second stakeholder workshop: paints, detergent capsules and geotextiles

March 17th , 2022

Draft Agenda

14.30 – 14:35   Introduction by the European Commission

14.35 – 14.45   Recap of the study's state – project team - (5 min presentation + 5 min Q&A)

14.45 – 14.55   Presentation of the interactive tool Beekast

14.55 – 15.55   Breakout sessions (identification of potential measures)

15.55 – 16.25   Reporting from the breakout sessions

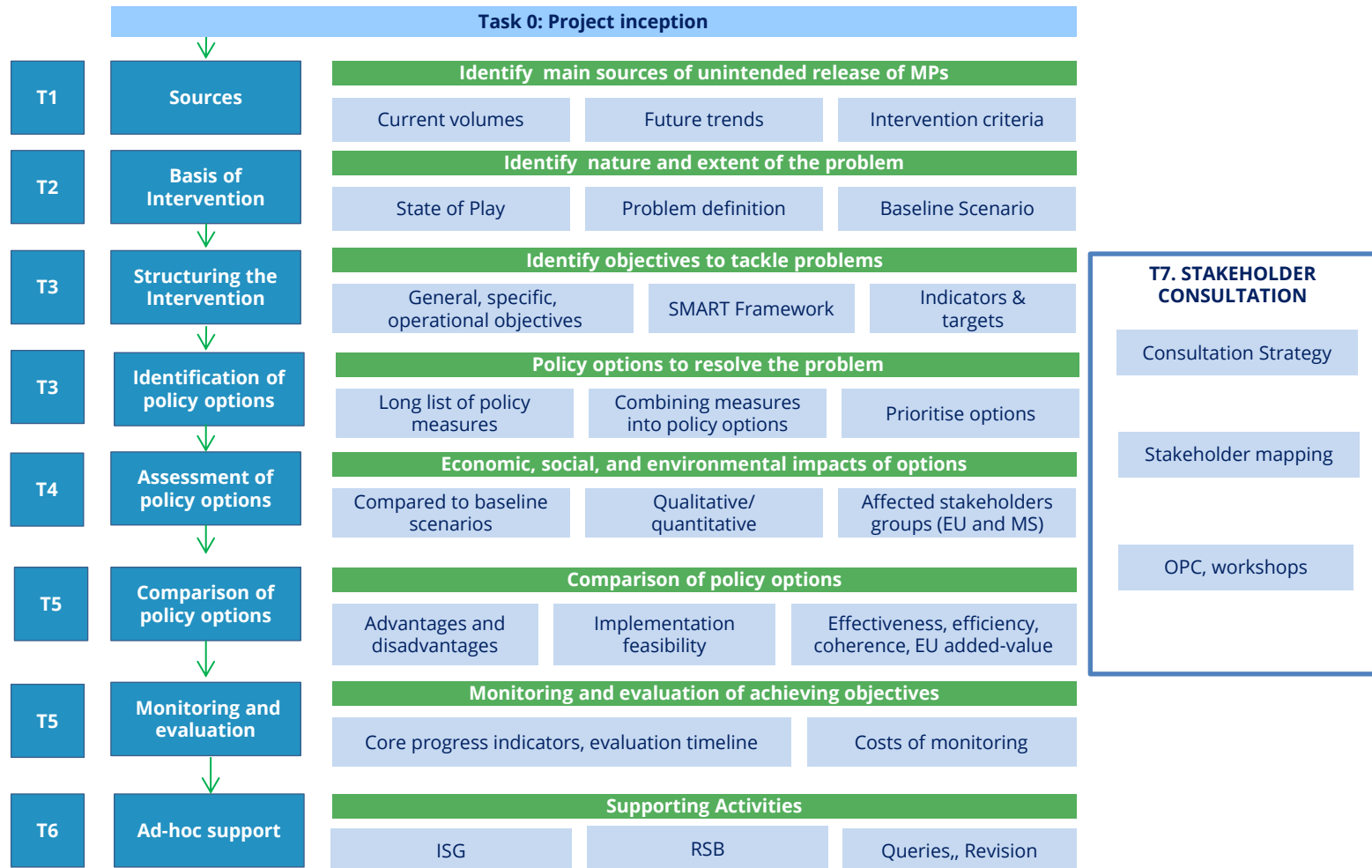16.25 – 16.30   Next steps by the project team and DG ENV

Objectives of the study

> To provide environmental, techno-economic analysis and support the Commission on possible actions to reduce the presence of unintended microplastics in the environment. This workshops focuses on paints, detergent capsules, and geotextiles:

- Define state of play and identify main source categories

- Identify the main problems and their drivers

- Establish the baseline

Now

- Identify objectives and develop policy measures to address the problems identified

- Consider policy options and assess them from economic, social and environmental perspectives

- Compare the options against the baseline scenarios to identify the best option or combination of options

- Undertake various stakeholder consultation activities

Approach and Methodology
Task Structure

Task 0: Project inception

T1	**Sources**

Identify main sources of unintended release of MPs

Current volumes	Future trends	Intervention criteria

T2	**Basis of Intervention**

Identify nature and extent of the problem

State of Play	Problem definition	Baseline Scenario

T3	**Structuring the Intervention**

Identify objectives to tackle problems

General, specific, operational objectives	SMART Framework	Indicators & targets

T3	**Identification of policy options**

Policy options to resolve the problem

Long list of policy measures	Combining measures into policy options	Prioritise options

T4	**Assessment of policy options**

Economic, social, and environmental impacts of options

Compared to baseline scenarios	Qualitative/ quantitative	Affected stakeholders groups (EU and MS)

T5	**Comparison of policy options**

Comparison of policy options

Advantages and disadvantages	Implementation feasibility	Effectiveness, efficiency, coherence, EU added-value

T5	**Monitoring and evaluation**

Monitoring and evaluation of achieving objectives

Core progress indicators, evaluation timeline	Costs of monitoring

T6	**Ad-hoc support**

Supporting Activities

ISG	RSB	Queries,, Revision

T7. STAKEHOLDER CONSULTATION

Consultation Strategy

Stakeholder mapping

OPC, workshops

Objectives of this 2nd stakeholder meeting

> Establish a long list of potential measures to reduce microplastics emissions from paints, detergent capsules, and geotextiles

> Classify those measures according to their effectiveness and technical feasibility

Presentation of the interactive tool Beekast

Discovering Beekast: first connection

English ⇕

Language setting

beekast

Session login

To log in to this session, please enter your username

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Identification of measures

Cleaning of the measures

Removing duplicates
Reformulating similar measures
Grouping measures together
Etc.

Voting on measures

Hover on the measure to give it points

You have ten points total to attribute

Do not forget to validate once you finished voting!

Vote results

After the votes, your moderator will share his screen in your Teams breakout room

Break out session on Paints

Problem definition

Overall problem	Unintentional release of micropollutants cause environmental and health risks
Main Problems	Microplastics is released during application, wear and tear, removal and disposal of **paint**

General problem drivers

Losses at application and removal without collection	Wear and tear of painted objects	Lack of knowledge/practice/policies

Specific problem drivers

Problem driver 1. Spray transfer efficiency < 90%	**Problem driver 1**. Paint paradox: paint should have a long lifetime on the painted object but not once leaked in the environment.	**Problem driver 1:** Lack of policies or legislation to promote collection of paint / dust released during application / maintenance
Problem driver 2. No recovery of blasting and sanding dust	**Problem driver 2**. Wear and tear is a diffuse source	**Problem driver 2:** High diversity of stakeholder and industries involved makes it difficult to harmonize good practices.
Problem driver 3. Increasing volume of paint use	**Problem driver 3.** Wear and tear induced maintenance is not targeted; this leads to full surface repainting and intense paint/maintenance demand	**Problem driver 3.** Lack of knowledge of what types of materials are used and where
Problem driver 4. Rinsing of roller / brush leads to microplastic release to waste water		

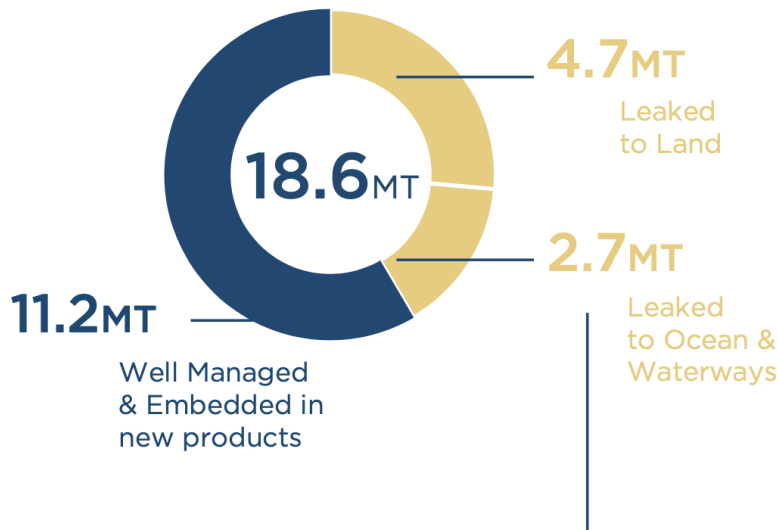# Quantification of paint microplastic emissions

Top-down approach:

Source	Geography	Sectors	Paint microplastic leakage (kt/yr)	Per capita equivalent (g/cap/yr)	Paint share of micro-plastic leakage (%)
IUCN *Boucher & Friot, 2017*	Global	• Marine • Road markings	156 (to ocean & waterways)	23 (to ocean & waterways)	10,7%
EUNOMIA *Hann et al, 2018*	EU	• Architectural • Marine • Automotive • Road markings	20 (to ocean & waterways)	40 (to ocean & waterways)	11.6%
MEPEX *Sundt, Schulze & Syversen, 2014*	Norway	• Architectural • Marine • Road markings	1.1 (to environment)	214 (to environment)	14%
UNEP *Ryberg et al., 2018*	Global	• Architectural • Marine • Road markings	640 (to environment)	84 (to environment)	21%
Swedish EPA *Magnuson et al., 2016*	Sweden	• Architectural • Marine • Road markings • General Industrial	1.8 (to environment)	186 (to environment)	9.6%
EA *Paruta et al. 2021*	Global	• Architectural • Marine • Road markings • General Industrial • Automotive • Industrial wood	1'857 (to ocean & waterways)	612 (to environment) 267 (to ocean & waterways)	58%
Our estimate	**EU-27**	• Architectural • Marine • Road markings • General Industrial • Automotive • Industrial wood	**~ 394** (to environment) **~ 217** (to ocean & waterways)	**~ 881** (to environment) **~ 485** (to ocean & waterways)	-

Values for EU currently being modelled / subject to change

Key findings from the EA report
PLASTIC PAINTS THE ENVIRONEMMNT

PLASTIC IN PAINT and TOTAL LEAKAGE

18.6MT

4.7MT
Leaked
to Land

2.7MT
Leaked
to Ocean &
Waterways

11.2MT
Well Managed
& Embedded in
new products

MICROPLASTIC LEAKAGE in Ocean & Waterways

1.9MT
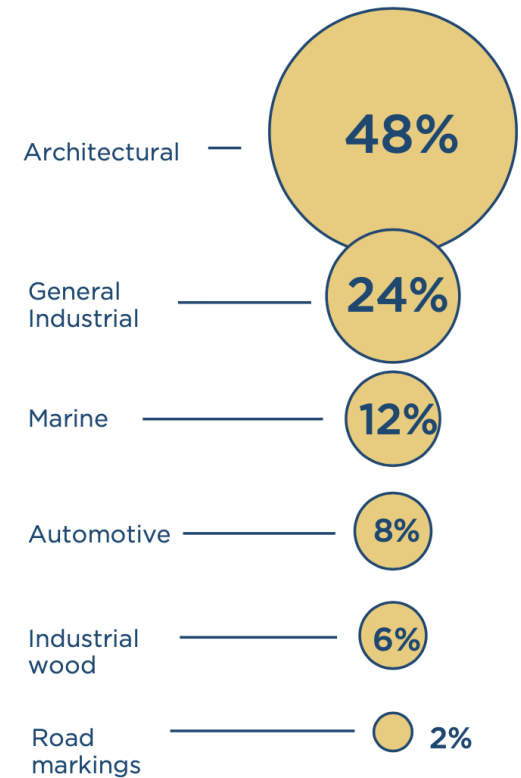
Architectural — **48%**

General Industrial — **24%**

Marine — **12%**

Automotive — **8%**

Industrial wood — **6%**

Road markings — **2%**

© EA- Environmental Action

Problem definition: Paint (examples)
What measures could be taken?

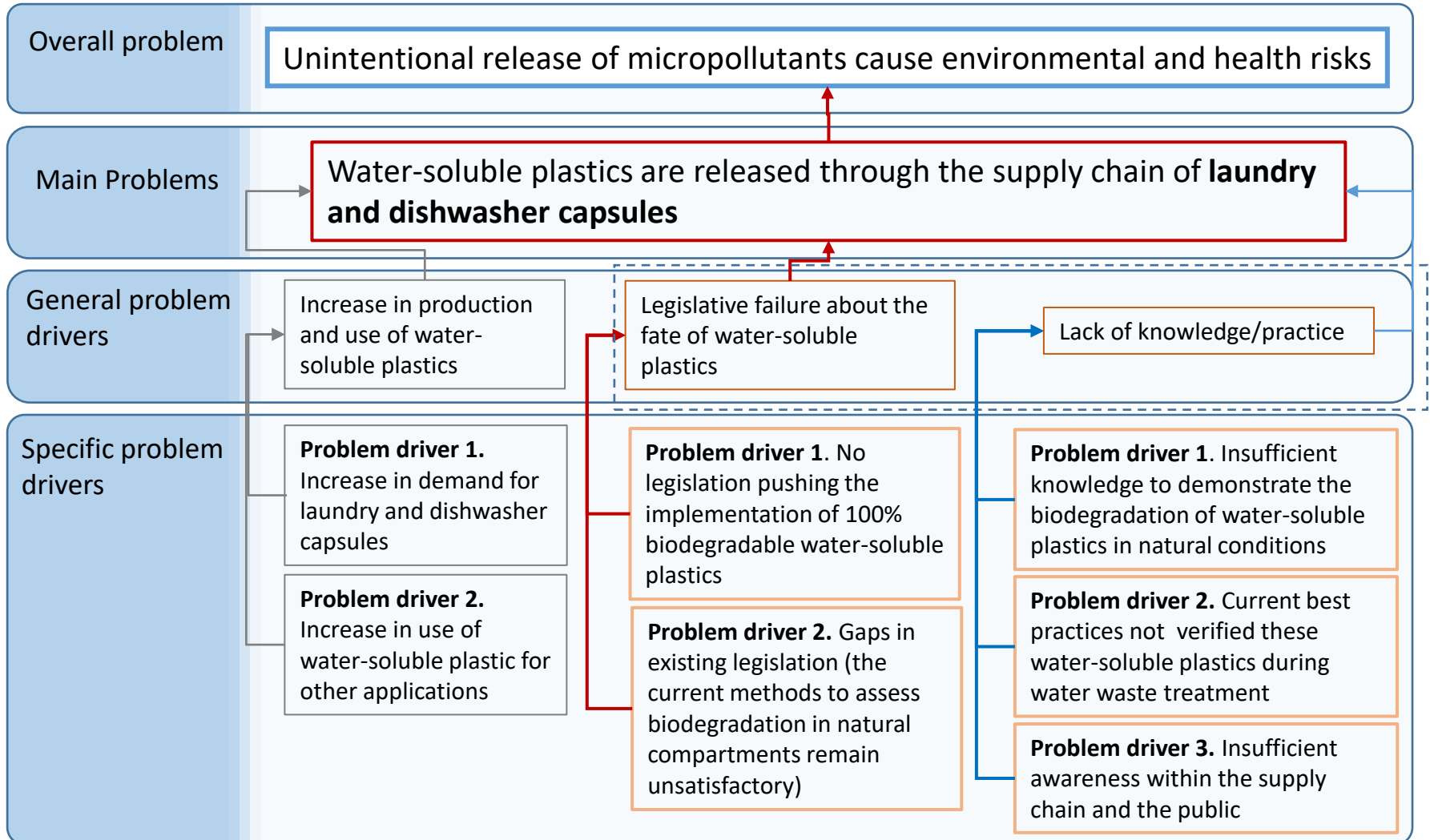| Category	Measure	Architectural	Marine	General Industrial	Road markings	Automotive	Industrial wood
Product design	Reduce use of antifouling biocidal self polishing paint (e.g. replacing with biocidal-free silicone paint, leisure boat washers,..)		X				
Product design	Promote investigation and production of mineral plastic free paints for Architectural coatings	X					
Application & Maintenance	Promote best practices for surface preparation		X	X			
Application & Maintenance	Improve transfer efficiency during spray application		X	X		X	X
Application & Maintenance	Promote spot-maintenance over full surface removal & repaint	X	X	X			
Application & Maintenance	Inlaid road-markings to reduce tyre abrasion				X		
Application & Maintenance	Promote paint capturing maintenance technologies (e.g. vacuum blasting)		X	X			
Application & Maintenance	Ensure environmental standards are observed during dry-docking of European ships		X				

Problem definition: Paint (examples)
What measures could be taken?

Category	Measure	Architectural	Marine	General Industrial	Road markings	Automotive	Industrial wood
Waste / waste water management	Paint microplastic capturing in waste-water treatment facilities	X	X	X	X		
Waste / waste water management	Improve/monitor ship-breaking practices		X				
Waste / waste water management	Reduce microplastic losses during demolition / recycling of painted building material	X					
Knowledge creation / capacity building	Paint products labelling must include plastic polymer quantities	X	X	X	X	X	X
Knowledge creation / capacity building	Specialised tranings for paint maintenance professionals	X	X	X	X	X	X
Others	Leisure boats storage on-shore		X				
Others	Promote use of materials that do no need paint protection, when environmentally and economically feasible	X	X				

Break out session on detergent capsules

Problem definition

Overall problem	Unintentional release of micropollutants cause environmental and health risks
Main Problems	Water-soluble plastics are released through the supply chain of **laundry and dishwasher capsules**

General problem drivers

Increase in production and use of water-soluble plastics	Legislative failure about the fate of water-soluble plastics	Lack of knowledge/practice

Specific problem drivers

Problem driver 1. Increase in demand for laundry and dishwasher capsules	**Problem driver 1**. No legislation pushing the implementation of 100% biodegradable water-soluble plastics	**Problem driver 1**. Insufficient knowledge to demonstrate the biodegradation of water-soluble plastics in natural conditions
Problem driver 2. Increase in use of water-soluble plastic for other applications	**Problem driver 2.** Gaps in existing legislation (the current methods to assess biodegradation in natural compartments remain unsatisfactory)	**Problem driver 2.** Current best practices not verified these water-soluble plastics during water waste treatment
		Problem driver 3. Insufficient awareness within the supply chain and the public

Problem definition: Laundry and Dishwasher capsules
Magnitude and EU dimension of the problem

> **In Europe**, the market for dishwasher tabs with water-soluble films represents more than 400,000 tonnes per year (i.e., 20 billion tabs of 20 g each). Out of these dishwasher tabs, **20,000 tonnes of water-soluble plastics used as protective films** are directly released through washing cycles.

> Our **bottom-up calculations** yielded **18,009 tonnes** of PVOH used in water soluble films

> The environmental impact remains uncertain as the PVOH grades can stay as dissolved PVOH polymer in different natural compartments **without being metabolized to ultimately form carbon dioxide** (complete biodegradation). A major PVOH manufacturer now offers a product with the "OK biodegradable WATER" seal of approval, but this is currently mainly used for 3D printing.
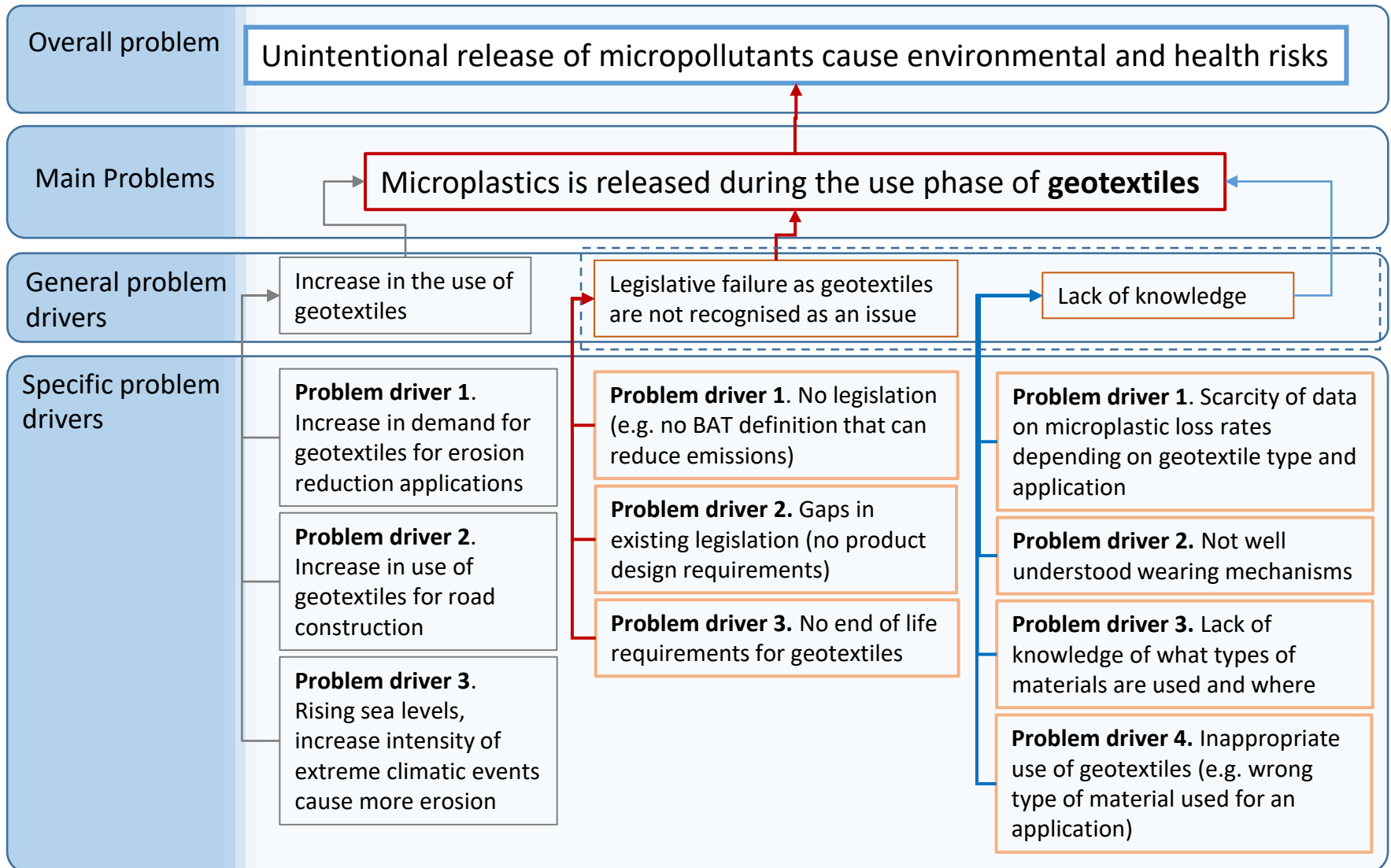
Problem definition: Laundry and Dishwasher capsules (examples)
What measures could be taken?

> Setting the **relevant conditions/labelling** for confirming the full biodegradation of water-soluble plastics in natural conditions (4°C)

> Strengthening of **reporting requirements** to ensure reliable and verifiable data on the biodegradation of water-soluble plastics in natural conditions

> Some **other measures** will be considered but we need to assess if there is enough information currently available to evaluate their technical feasibility and relevance:

- **Implementing other solutions** than the current used PVOH
- **Limiting the use of water-soluble plastics** for laundry and dishwasher capsules
- **Evaluating the real impact** of water-soluble plastics that are not biodegradable in our ecosystem

Break out session on Geotextiles

Problem definition

Overall problem	Unintentional release of micropollutants cause environmental and health risks

Main Problems	Microplastics is released during the use phase of **geotextiles**

General problem drivers	Increase in the use of geotextiles	Legislative failure as geotextiles are not recognised as an issue	Lack of knowledge

Specific problem drivers	**Problem driver 1.** Increase in demand for geotextiles for erosion reduction applications	**Problem driver 1.** No legislation (e.g. no BAT definition that can reduce emissions)	**Problem driver 1.** Scarcity of data on microplastic loss rates depending on geotextile type and application
	Problem driver 2. Increase in use of geotextiles for road construction	**Problem driver 2.** Gaps in existing legislation (no product design requirements)	**Problem driver 2.** Not well understood wearing mechanisms
	Problem driver 3. Rising sea levels, increase intensity of extreme climatic events cause more erosion	**Problem driver 3.** No end of life requirements for geotextiles	**Problem driver 3.** Lack of knowledge of what types of materials are used and where
			Problem driver 4. Inappropriate use of geotextiles (e.g. wrong type of material used for an application)

Microplastics emissions from geotextiles: Calculation

> There are **high uncertainties** on the **emission rate** of microplastics from geotextiles, **talks are ongoing with stakeholders** to have a better picture on the values.

> Quantities sold in 2021 in the EU : **530 712 tons**[5]

> EU Geotextile market (geotextile type market shares are assumed to be the same as in the US):

- 62.5% non-woven
- 27.5% woven
- 10% other

> Geotextile use:[6]

- Building industry: 9.8%
- Filtration (air and gas and liquid): 3.6%
- Civil engineering/Underground: 5.4%

5. Calculated using a non-woven synthetic textile market size of 1 755 000 tons, an 18.9% share of these used for geotextile applications, and a non-woven geotextile market share in the total geotextile sales of 62.5%
6. Nonwovens markets (edana.org)

Problem definition: Geotextiles
Magnitude and EU dimension of the problem

> The total quantity of geotextiles installed in the EU was estimated to be **5 048 962 tons** assuming a constant 10% CAGR over the last 20 years.[7]

> The European geotextile market is expected to grow from 20% to 24% of the world's market in 2024.[8]

> There are no barriers between geotextiles and the environment, any microplastic released is directly released into the environment and cannot be removed.

> Geotextiles' maintenance and end of life is not considered and they are not disposed of when worn out.

7. Market, Geotextile. "Geotextile Market Size & Share | Global Industry Forecast To 2022&| Marketsandmarkets". Marketsandmarkets.Com, 3399, https://www.marketsandmarkets.com/Market-Reports/geotextiles-market-492.html. Accessed 17 Mar 2022.
8. Geotextiles Market Share Statistics 2024 | Global Industry Report. (2022). Retrieved 6 January 2022, from https://www.gminsights.com/industry-analysis/geotextile-market

Problem definition: geotextiles (examples)
What measures could be taken?

> **Product design requirements** do reduce microfibre emissions from geotextiles

> **Prevent the use** of certain types of geotextiles **for specific applications** such as erosion reduction, especially in **vulnerable environments** (e.g. marshes).

> **Best practices** for the construction sector to prevent microplastic emissions

> Enforce **maintenance requirements** for geotextiles

> **Guidance on the use of geotextile** for specific applications to prevent microplastic emissions

> Set **limit values for microplastics emissions** in specific applications

> Potentially target them through an **EPR** system (end-of-life)

Feedback from the breakout sessions

Next steps

Next steps

> Additional feedback (by 31/03/2022): Data and evidence, addition measures

> Bilateral discussions (during the first half of April 2022): Costs of potential measures

> Impact assessment to be submitted to DG ENV: 02/05/2023

Thank you
Key contacts

- Study lead (pellets and geotextiles): Bio Innovation Service (microplastics@biois.eu)

- Tyres: TUB and Wessling, Johannes Neupert (neupert@tu-berlin.de)

- Textiles: RDC Environment, Tom Huppertz (tom.huppertz@rdcenvironment.be)

- Cross-cutting issues and pellets, Air Quality Consultants,
Ben Grebot (bengrebot@aqconsultants.co.uk)

- Laundry and dishwasher capsules: UMons, Jean-Marie Raquez (jean-marie.raquez@umons.ac.be)

- Paints: EA Earth, Julien Boucher (Julien.boucher@e-a.earth) Paola Paruta
(paola.paruta@e-a.earth)