



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

## Stakeholder workshop

March 21<sup>st</sup>, 2022

# Draft Agenda (9.30-11.30)

- **Introduction** – DG ENV
- **Recap** of the study's state – project team – presentation + Q&A
- **Tyres** - presentation of measures and preliminary results of the analysis - project team – presentation + Q&A
- **Pellets** - presentation of measures and preliminary results of the analysis – project team – presentation + Q&A
- **Textiles** - presentation of measures and preliminary results of the analysis – project team – presentation + Q&A
- **Next steps** – project team

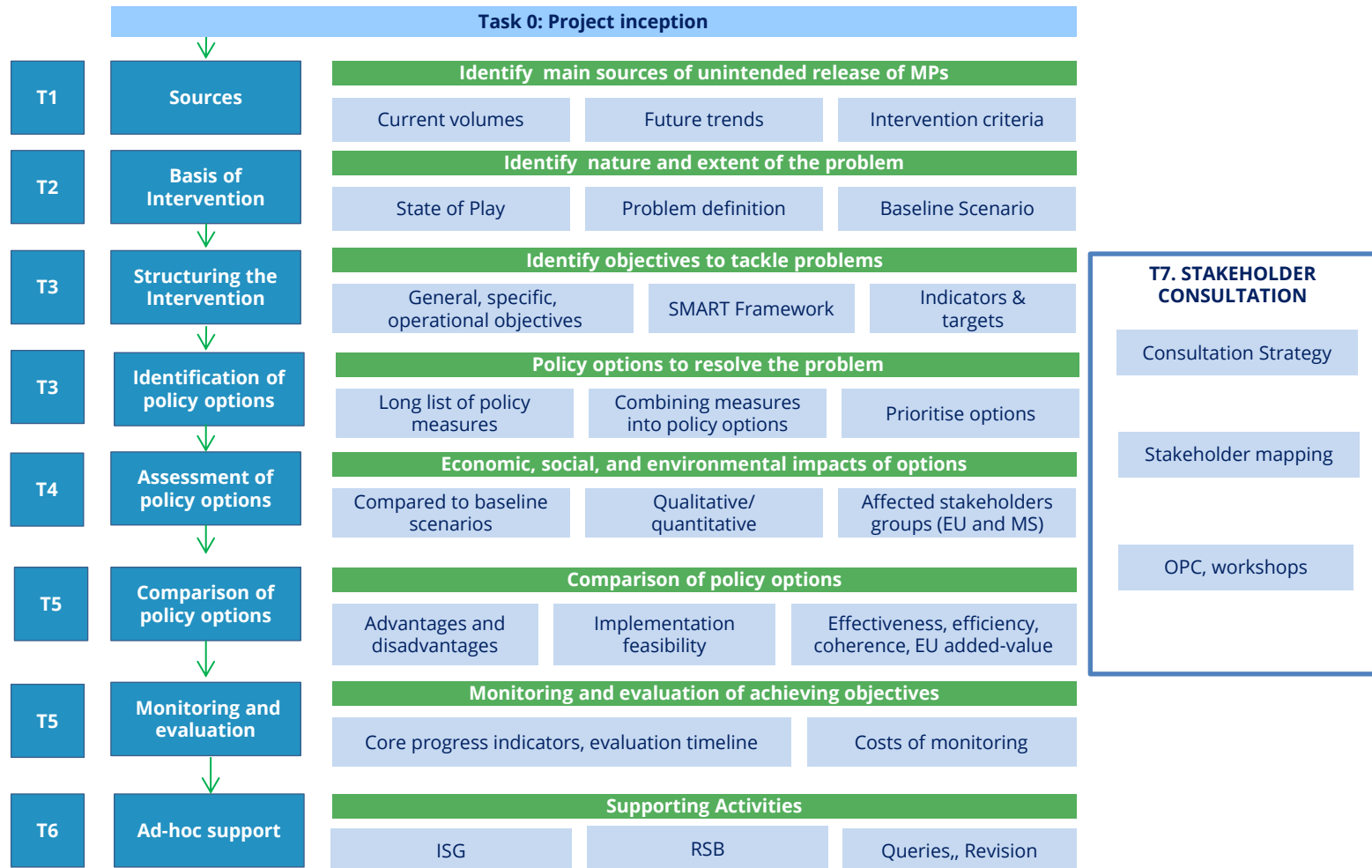
# Objectives of the study

- > To provide environmental, techno-economic analysis and support the Commission on possible actions to reduce the presence of unintended microplastics in the environment. This workshop focuses on pellets, textiles, and tyres:
  - Define state of play and identify main source categories
  - Identify the main problems and their drivers
  - Establish the baseline
  - 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

Now

# Approach and Methodology

## Task Structure



# Objectives of this 3<sup>rd</sup> stakeholder meeting

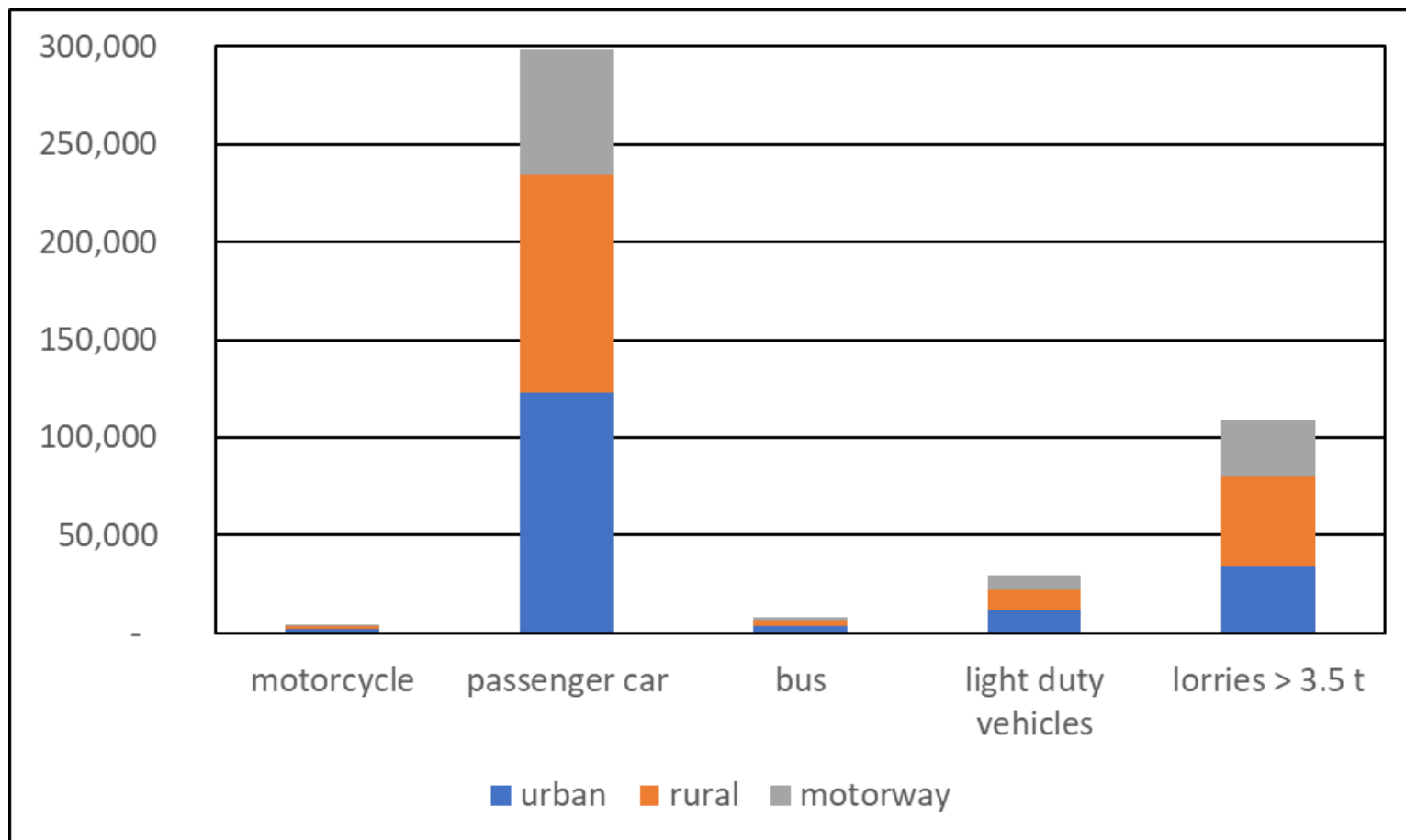
- > Recap on the measures proposed and shortlisted for evaluation
- > Present the preliminary results of the measure analysis
- > Gather feedback from stakeholders on the analysis

**Note:** focus at this stage is on individual measures, there are a number of possible legal and voluntary initiatives that could deliver the measures discussed for each source

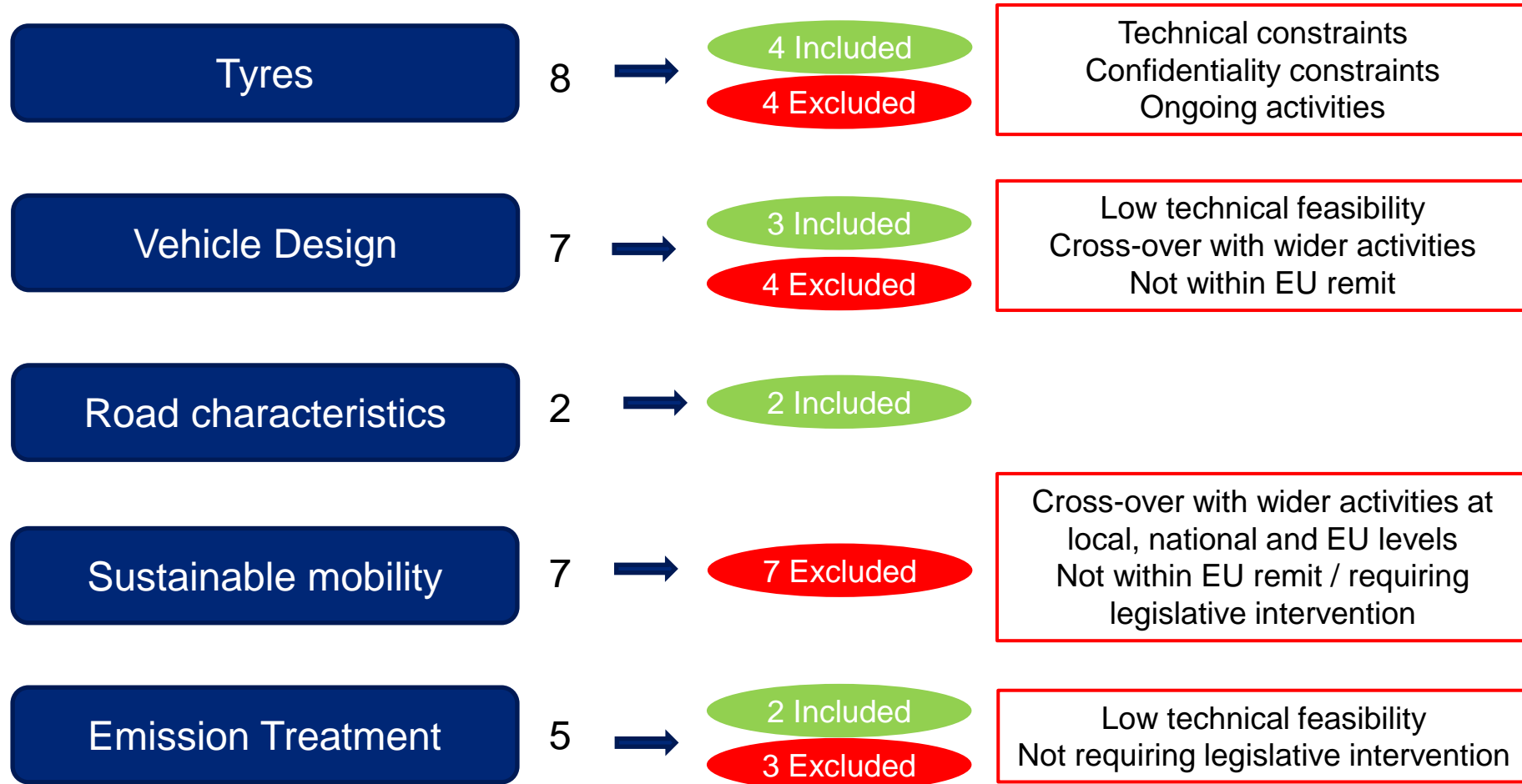
**Tyres**

# Microplastics emissions from automotive tyres in the EU

Extrapolation of the tyre wear emission rate with that of mileage (taking into account vehicle and road types) resulted in a total emitted mass in the EU27 of approximately **450,000 t/a (TWP)**



# 29 policy measures taken through the screening process





# Initial assessment of remaining policy measures after the screening and modifications

## Tyres

Measure	Costs	Benefits
<b>1. TWP emission limit value for abrasion (plus test method)</b>	<ul style="list-style-type: none"> <li>• Precondition to have test method in place</li> <li>• Testing costs assessed as low</li> <li>• No or low additional costs for tyres with low abrasion rate although some uncertainties</li> </ul>	<ul style="list-style-type: none"> <li>• Benefit in the order of 10-20% reduction of emissions</li> <li>• Benefits can be realised fairly quickly e.g. 5-10 years</li> <li>• Potential lifetime increase but uncertain due to other factors</li> </ul>
<b>2. TWP emission labelling integrated into the energy label (plus test method)</b>	<ul style="list-style-type: none"> <li>• Precondition to have test method in place</li> <li>• Testing costs and inclusion on label assessed as low</li> </ul>	<ul style="list-style-type: none"> <li>• Benefits depend on consumer reaction</li> <li>• Expected to be low (&lt;5% reduction in emissions) – would need to be supported by consumer awareness activities</li> </ul>
<b>3. Extended Producer Responsibility (EPR) for tyre manufacturers (modulated fees)</b>	<ul style="list-style-type: none"> <li>• Costs to set-up and manage the scheme</li> <li>• Costs for industry depends on fee level and structure</li> <li>• Fees may be passed on to consumers</li> </ul>	<ul style="list-style-type: none"> <li>• Incentives for manufactures to innovate and produce tyres with lower abrasion rate</li> <li>• Tool to combine with other measures e.g. financing for road infrastructure measures</li> </ul>

# Initial assessment of remaining policy measures after the screening and modifications

Vehicle

Measure	Costs	Benefits
<b>4. Promotion of artificial intelligence / autonomous driving and advanced driver assistance systems in vehicles to reduce abrasion</b>	<ul style="list-style-type: none"><li>• High uncertainty in costs – lots of ongoing activity already that is likely to impact on tyre wear</li></ul>	<ul style="list-style-type: none"><li>• High uncertainty in scale of benefits – difficult to estimate reduction potential</li></ul>
<b>5. Enhance the monitoring of tyre pressure to reduce emissions (not only focused on driver safety)</b>	<ul style="list-style-type: none"><li>• Already required for new vehicles and trucks – change in alert levels / calibration</li><li>• No / limited additional cost</li></ul>	<ul style="list-style-type: none"><li>• Low impacts on microplastic emissions (over and above existing TPMS)</li><li>• Fuel efficiency</li></ul>

# Initial assessment of remaining policy measures after the screening and modifications

Road

Measure	Costs	Benefits
<b>6. Abrasion rate criteria to be added to road design requirements &amp; road material characteristics (porous asphalt / rubber asphalt)</b>	<ul style="list-style-type: none"><li>• Potentially high investment costs – still under development</li></ul>	<ul style="list-style-type: none"><li>• Benefits from new road surface materials</li><li>• Synergies (lower energy consumption, lower noise etc.)</li><li>• Medium to longer term effects</li></ul>

# Initial assessment of remaining policy measures after the screening and modifications

Emission treatment

Measure	Costs	Benefits
<b>7. Improve capture and treat road run-off water</b> (e.g. Filter systems for gullies)	<ul style="list-style-type: none"><li>• Potentially high investment costs</li></ul>	<ul style="list-style-type: none"><li>• Reduction potential very high - treatment can remove ~90% although not all roads likely to be suitable for implementation</li><li>• Longer term potential</li></ul>
<b>8. Improve road cleaning in high emission hotspots</b> (intelligent network)	<ul style="list-style-type: none"><li>• Additional costs are challenging to estimate – high uncertainty.</li><li>• No data on current practices in EU.</li></ul>	<ul style="list-style-type: none"><li>• Reduction potential could be significant but very localized - mainly in urban areas .</li></ul>

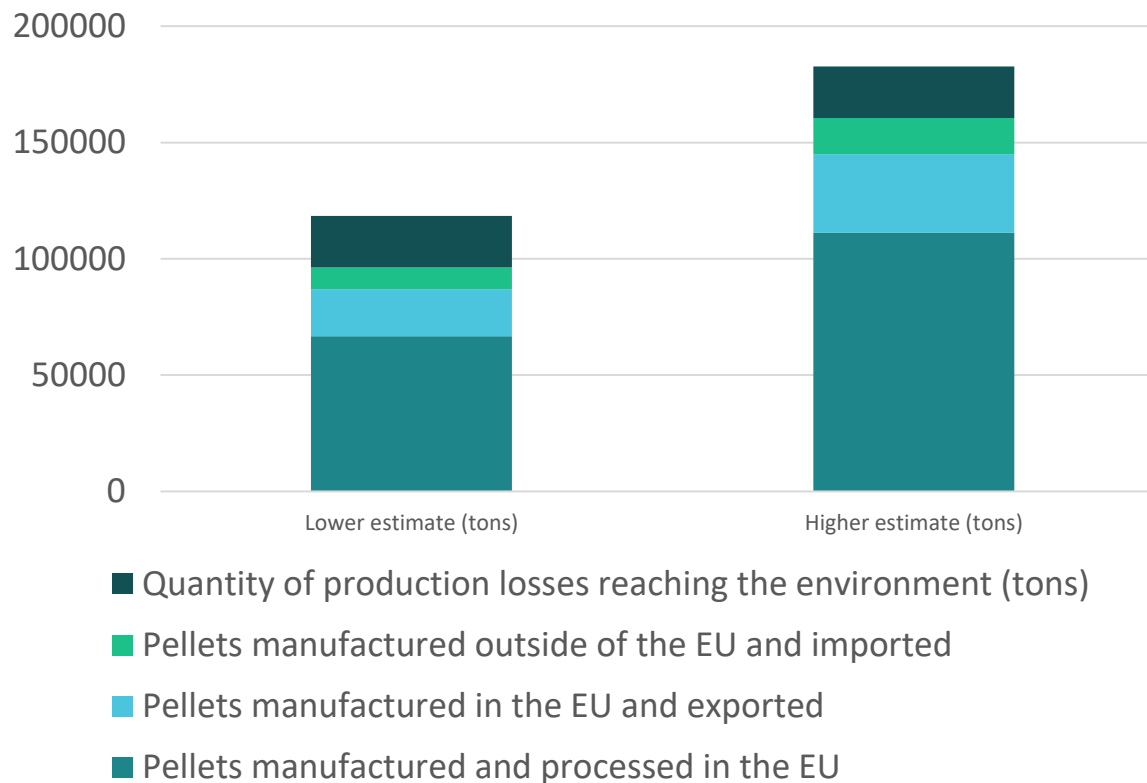
# Data gaps and key uncertainties

- > Further review ongoing of **potential trade-offs between tyre wear and other parameters** (including e.g. safety) – uncertainties on any potential cost implications
- > Gaps for **heavy-duty vehicles** on differences in abrasion rates
- > **Assessment of impacts of wider (non-tyre) measures** related to roads, vehicles and emissions treatment ongoing – **gaps on likely impacts as well as interactions with wider strategies** e.g. autonomous vehicles, decarbonisation, UWWT Directive revision.

# Pellets

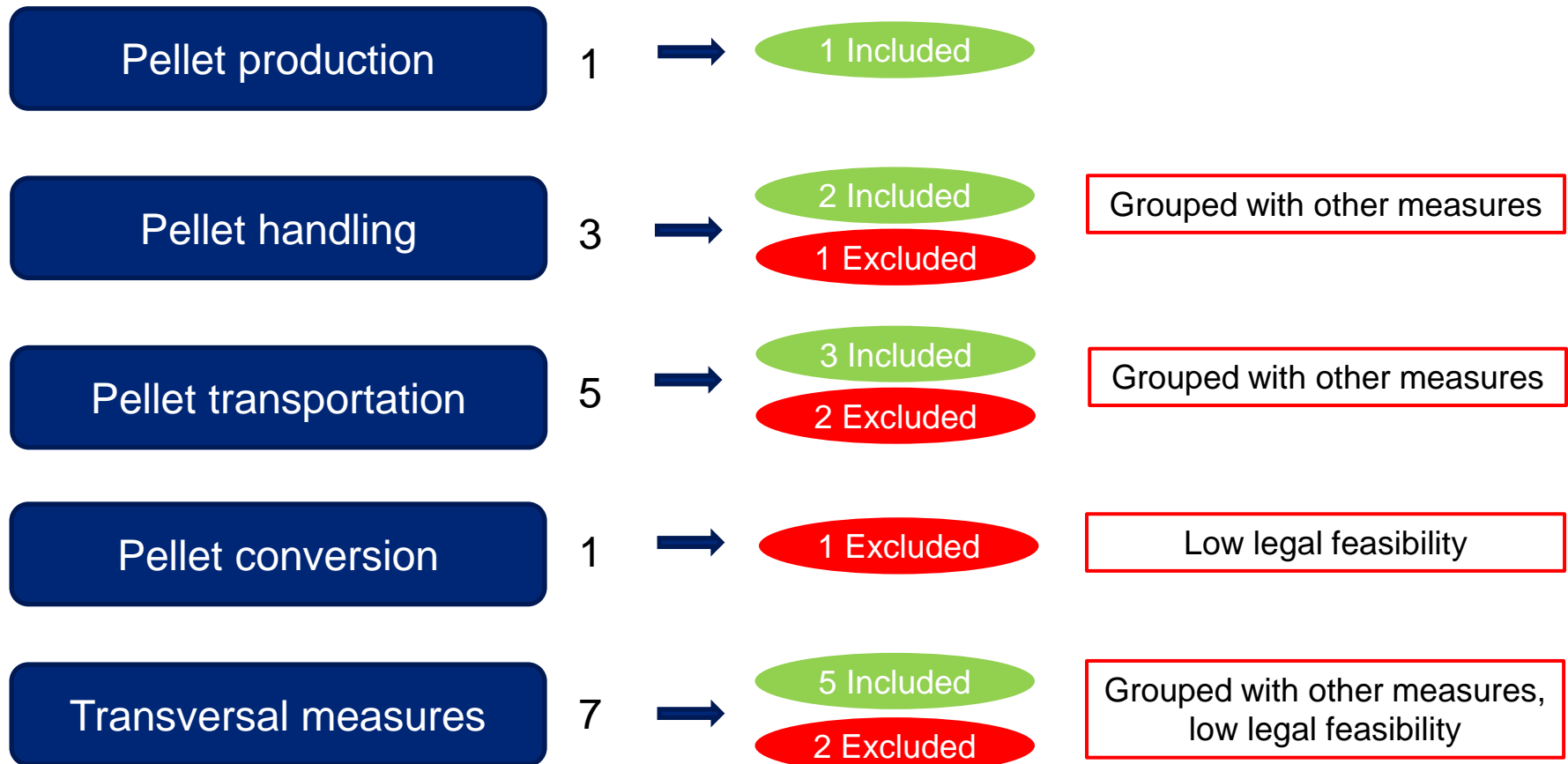
# Pellet losses in the EU

Calculated pellet losses in the EU in 2019 as function of the step in the value chain



→ Total between 118 475 and 182 675 t/year

# 17 policy measures





# Initial assessment of remaining policy measures after the screening and modifications

Measure	Costs	Benefits
<b>Voluntary commitment to OCS certification scheme</b>	<ul style="list-style-type: none"> <li>Higher CAPEX (depends on plant size)</li> <li>Higher OPEX (depends on plant size)</li> <li>Auditing costs (negligible)</li> </ul>	<ul style="list-style-type: none"> <li>Microplastic emission reduction (high)</li> </ul>
<b>Action at EU level:</b> <b>1. Strengthen the enforcement and sanctioning of existing legislation</b> <b>2. Support Sri Lanka's pledge to the IMO to categorise pellets as harmful and add stowing requirements</b> <b>3. Pellet emission reduction target</b>	<b>1. FTE for MS (monitoring existing legislation application and sanctioning)</b>	<ul style="list-style-type: none"> <li>Microplastic emission reduction (low)</li> <li>Improved company compliance with existing legislation</li> </ul>
	<b>2. OPEX (amending the IMO, new stowing practices)</b>	<ul style="list-style-type: none"> <li>Microplastic emission reduction (low)</li> </ul>
	<b>3. Higher CAPEX (containment measures) and OPEX (new practices)</b>	<ul style="list-style-type: none"> <li>Microplastic emission reduction (medium)</li> </ul>

# Initial assessment of remaining policy measures after the screening and modifications

Measure	Costs	Benefits
<p><b>Action at EU level:</b></p> <p><b>4. Require that all containers and packaging material for pellet transports are airtight and puncture resistant</b></p>	<ul style="list-style-type: none"> <li>• Higher CAPEX (new packaging)</li> <li>• Higher OPEX (certification)</li> <li>• FTE (implement new practices)</li> </ul>	<ul style="list-style-type: none"> <li>• Microplastic emission reduction (high)</li> </ul>
<p><b>Develop an EPR system for the entire value chain</b></p>	<ul style="list-style-type: none"> <li>• EPR cost (PRO, MS, companies)</li> </ul>	<ul style="list-style-type: none"> <li>• Microplastic emission reduction (medium)</li> <li>• Incentivise companies to reduce emissions</li> </ul>

# Initial assessment of remaining policy measures after the screening and modifications

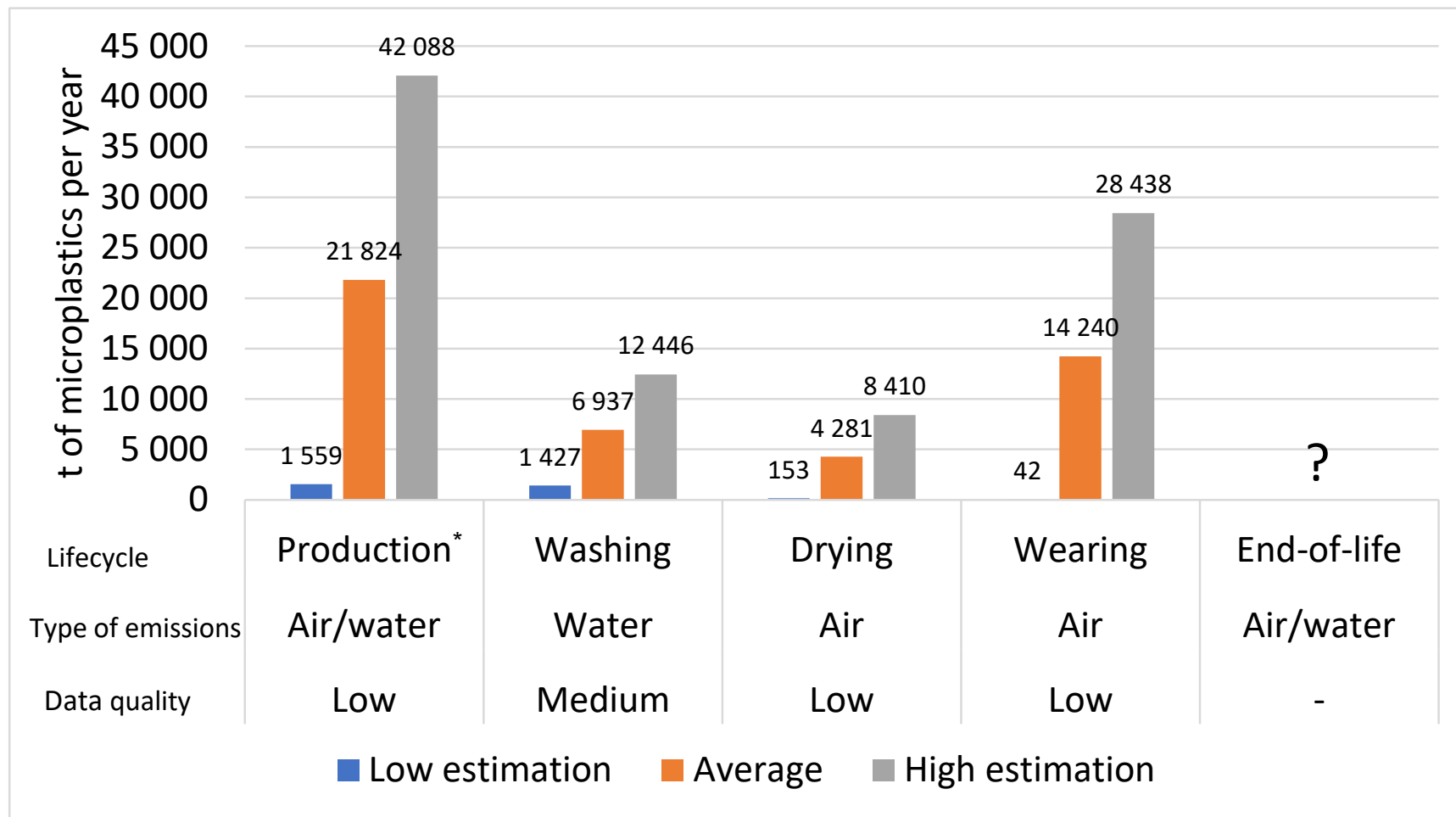
Measure	Costs	Benefits
<b>Develop measurement standards for pellets (quantification of losses methodology)</b>	<ul style="list-style-type: none"> <li>• Higher OPEX (sampling, analysing)</li> <li>• FTE for monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• Raise awareness</li> </ul>
<b>Mandatory reporting of container lost at sea made publicly available</b>	<ul style="list-style-type: none"> <li>• Several FTE for monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• Increases knowledge</li> </ul>
<b>Packaging labelling information, training for sector's employees, and cleaning equipment to be made available</b>	<ul style="list-style-type: none"> <li>• Label cost (tests, audit and label)</li> <li>• Several FTE for training</li> <li>• Training costs</li> <li>• CAPEX (equipment cost)</li> </ul>	<ul style="list-style-type: none"> <li>• Raise awareness</li> </ul>

# Data gaps and key uncertainties

- > Precise assessment of the **costs** for industry to upgrade their equipment
- > Extent to which **certain practices already in use and/or planned to be** under existing initiatives e.g. OCS
- > Gaps in **emission reduction quantification for equipment upgrading**

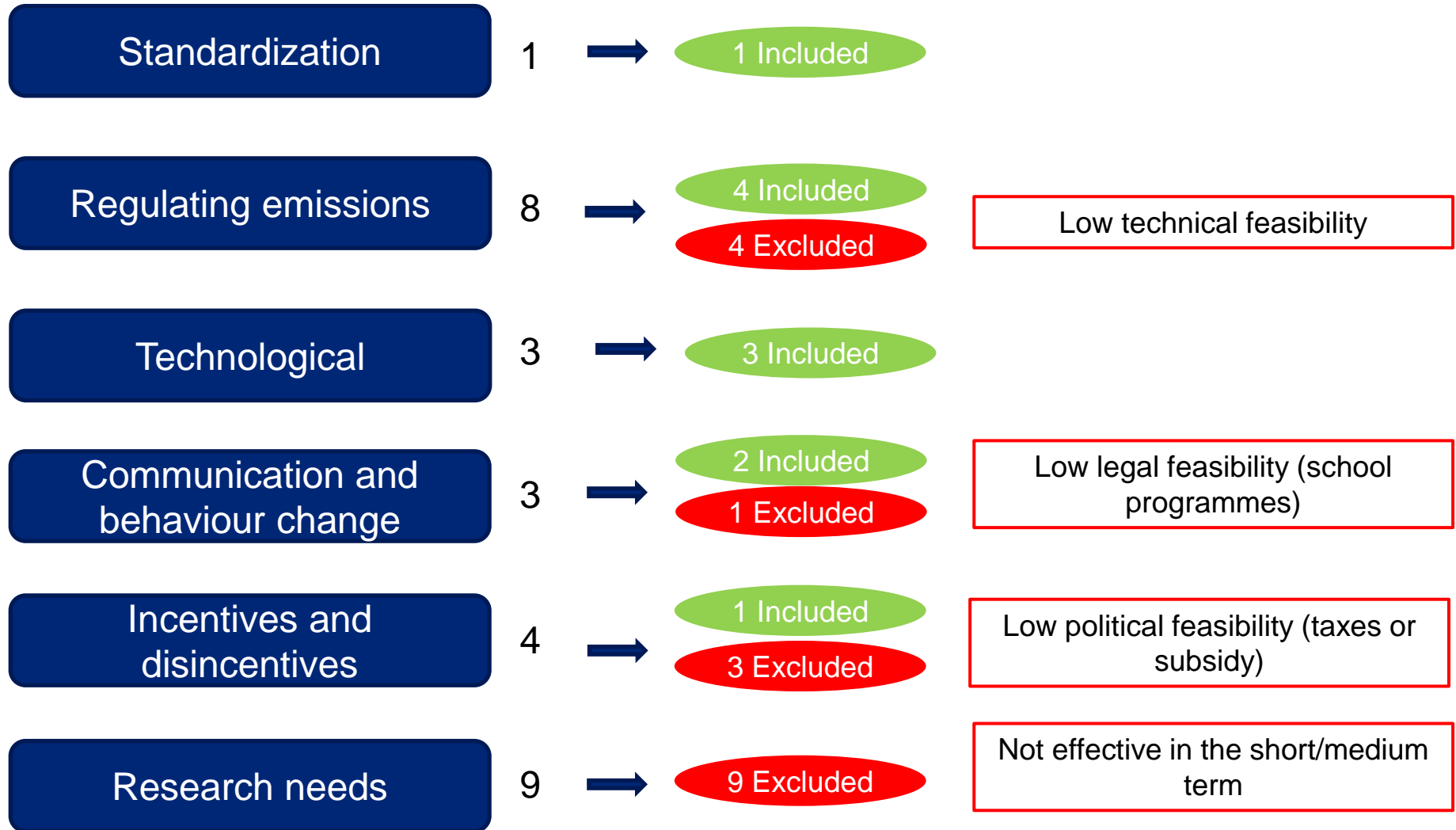
# Textiles

# Microplastics emissions from synthetic textile in the EU baseline 2030



\* Of which 21 % happen in the EU

# 28 policy measures and screening



# Initial assessment of remaining policy measures after the screening and modifications

Measure	Costs	Benefits
<b>1a Restriction of all synthetic fibres for certain applications</b>	<ul style="list-style-type: none"> <li>• Material cost</li> <li>• Environment (water)</li> </ul>	<ul style="list-style-type: none"> <li>• Microplastic emission reduction (high)</li> </ul>
<b>1b Restriction of synthetic fibres and fabrics with high releases of microplastics</b>	<ul style="list-style-type: none"> <li>• Material cost</li> <li>• Environment (water)</li> </ul>	<ul style="list-style-type: none"> <li>• Microplastic emission reduction (high)</li> </ul>
<b>2a Emission limit during production</b>	<ul style="list-style-type: none"> <li>• Higher CAPEX</li> <li>• Higher energy consumption</li> </ul>	<ul style="list-style-type: none"> <li>• Microplastic emission reduction (medium)</li> <li>• Lower maintenance cost</li> <li>• Lower material wastage</li> </ul>
<b>2b Emission limit for textiles placed on the EU market</b>	<ul style="list-style-type: none"> <li>• Higher CAPEX</li> <li>• Higher OPEX (labour, energy)</li> <li>• Lower process speed</li> </ul>	<ul style="list-style-type: none"> <li>• Microplastic emission reduction (low)</li> </ul>



# Initial assessment of remaining policy measures after the screening and modifications

Measure	Costs	Benefits
<b>3 Mandatory prewashing before placing on the market</b>	<ul style="list-style-type: none"> <li>• CAPEX (washing and drying machines)</li> <li>• OPEX (water, energy, detergent, labour)</li> <li>• Environment (water, climate change)</li> </ul>	<ul style="list-style-type: none"> <li>• Microplastic emission reduction (low)</li> </ul>
<b>4 Specific waste water treatment in production plants</b>	<ul style="list-style-type: none"> <li>• CAPEX</li> <li>• OPEX (energy)</li> <li>• Environment (climate change)</li> </ul>	<ul style="list-style-type: none"> <li>• Microplastic emission reduction (medium)</li> <li>• Environment (water quality)</li> </ul>
<b>5 Making filters compulsory for washing machines</b>	<ul style="list-style-type: none"> <li>• CAPEX (filters)</li> <li>• OPEX (water and energy)</li> <li>• Environment (water, climate change)</li> </ul>	<ul style="list-style-type: none"> <li>• Microplastic emission reduction (medium)</li> </ul>
<b>6 Textile EPR including microplastics (modulated fees)</b>	<ul style="list-style-type: none"> <li>• EPR cost (PRO, MS, companies)</li> </ul>	<ul style="list-style-type: none"> <li>• Tool to combine with other measures</li> </ul>

# Initial assessment of remaining policy measures after the screening and modifications

Measure	Costs	Benefits
<b>7 Communication campaign aiming at raising awareness and communicating best practise for consumers</b>	<ul style="list-style-type: none"> <li>• Communication cost</li> </ul>	<ul style="list-style-type: none"> <li>• Raise awareness</li> <li>• Uncertainties over consumer response</li> </ul>
<b>8 Mandatory microplastic label for textile</b>	<ul style="list-style-type: none"> <li>• Label cost (tests, audit and label)</li> </ul>	<ul style="list-style-type: none"> <li>• Raise awareness</li> <li>• Uncertainties over consumer response</li> </ul>
<b>9 Create a standardized measure to quantify microplastics emissions on the lifecycle</b>	<ul style="list-style-type: none"> <li>• Administrative cost (expert group and companies)</li> </ul>	<ul style="list-style-type: none"> <li>• Necessary for other measures</li> </ul>

# Thank you

## Key contacts

- Study lead and pellets : Bio Innovation Service ([microplastics@biois.eu](mailto:microplastics@biois.eu))
- Tyres: TUB and Wessling, Johannes Neupert ([neupert@tu-berlin.de](mailto:neupert@tu-berlin.de))
- Textiles: RDC Environment, Tom Huppertz ([tom.huppertz@rdcenvironment.be](mailto:tom.huppertz@rdcenvironment.be))
- Cross-cutting issues and pellets, Air Quality Consultants, Ben Grebot ([bengrebot@aqconsultants.co.uk](mailto:bengrebot@aqconsultants.co.uk))