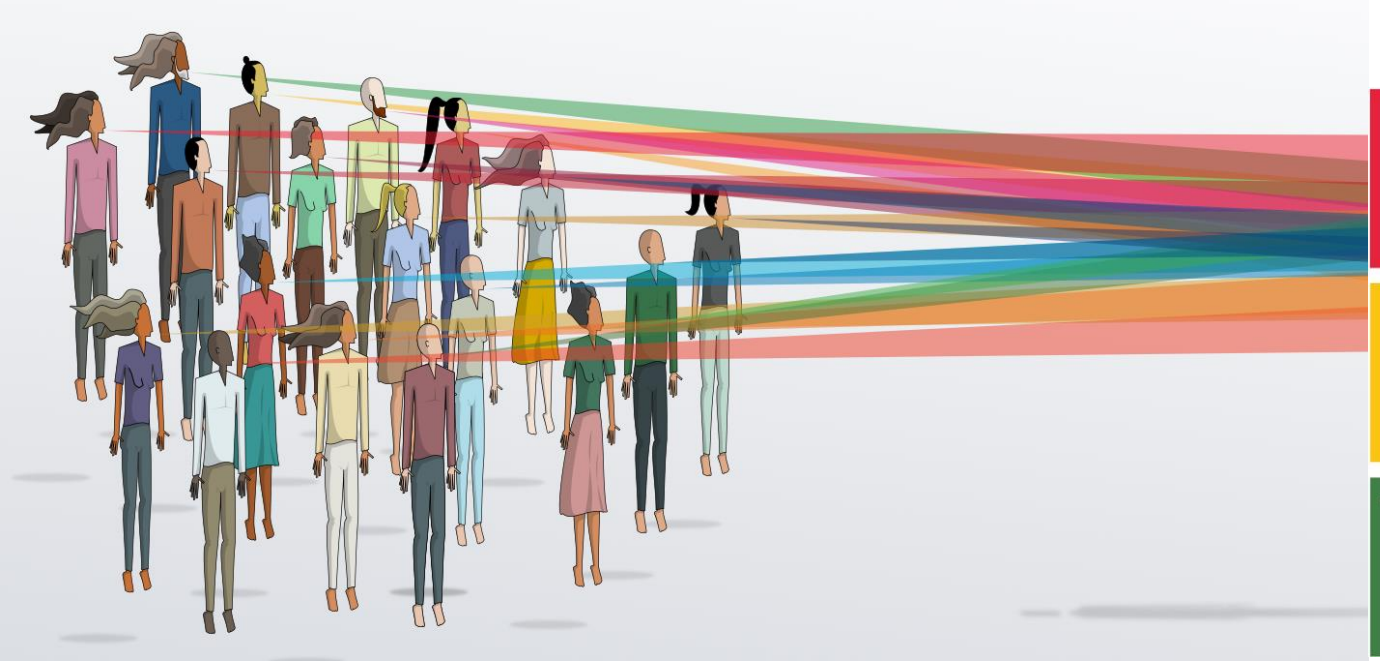
The Home of Geosynthetics

Microplastics – Why geosynthetics are not the problem

The International
Geosynthetics Society

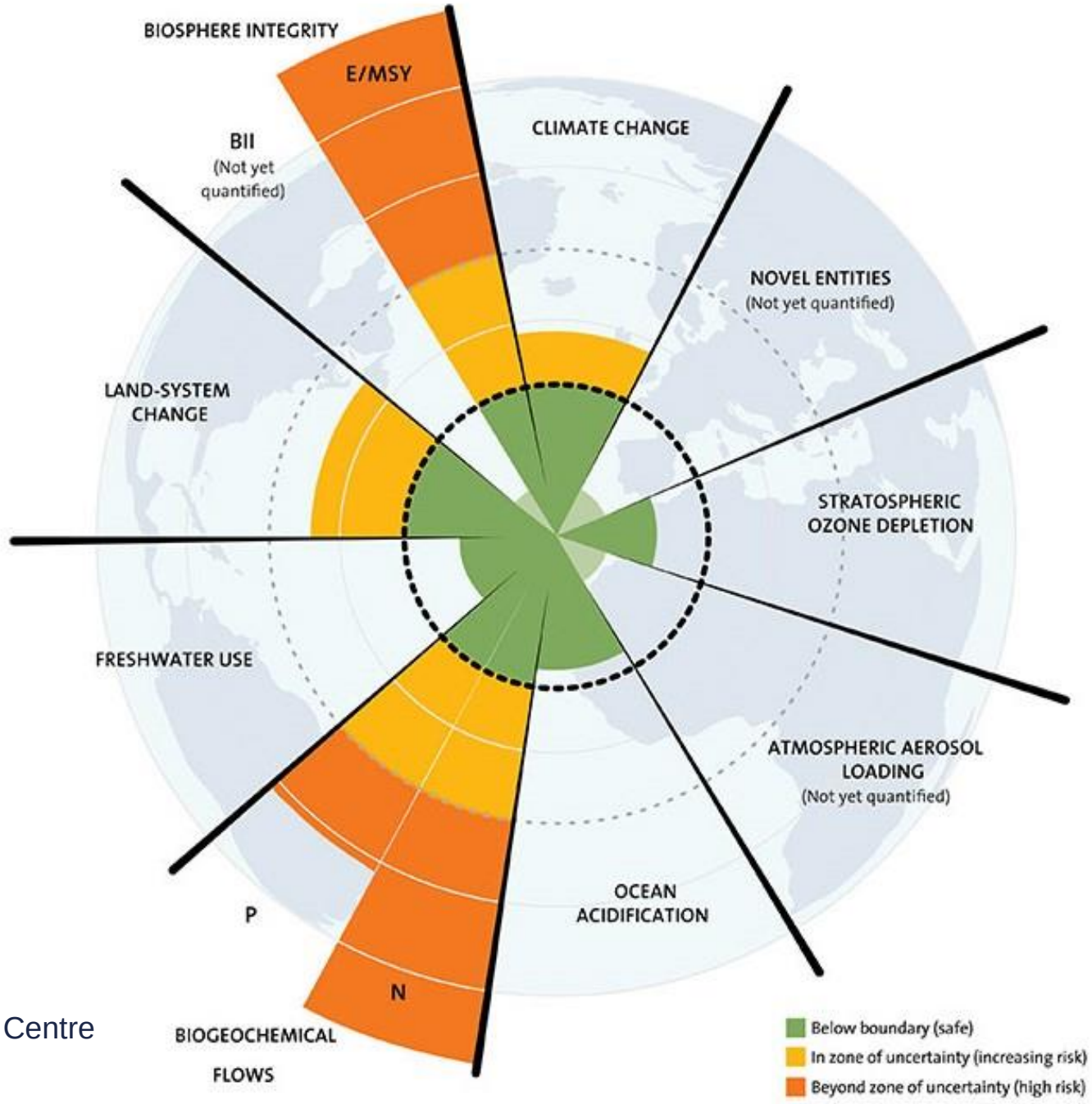
Agenda

1 Balancing the needs of people and planet
2 An example of novel entities: microplastics
3 European policy risks
4 IGS position statement and further reading



People needs

Planetary needs



Source: Stockholm Resilience Centre

Geosynthetics contribute to sustainable outcomes:

- Energy and resource savings
- Surface and groundwater preservation
- Replacement and reduction of alternative materials, e.g. aggregates
- Environmental protection

Planetary boundary – novel entities

“The safe operating space of the planetary boundary of novel entities is exceeded since annual production and releases are increasing at a pace that outstrips the global capacity for assessment and monitoring”.

Source: Persson et al 2022

Novel entities: microplastics and their origins

Source: National Oceanographic Centre 2021

> Litter and mismanaged plastic waste are commonly identified as the primary source of marine plastic pollution when considering plastics of all sizes

> Confidently linking plastics to their precise sources remains a challenge

Sources of microplastics: NOC

Tyres	48%
Pellets	28%
Textile laundry	8%
Road markings	7%
Building paint	3%
Fishing gear	2%
Automotive paints	2%

Source: National Oceanographic Centre 2021

Sources of microplastics (Germany): Fraunhofer

Annual total per person	4,000g
Tyres	1,285g
Waste disposal	303g
Asphalt abrasion	228g
Pellets loss	182g
Sports/playgrounds	132g
Construction	117g
Shoe soles	109g
Packaging	99g
Road markings	91g
Textiles laundry	77g

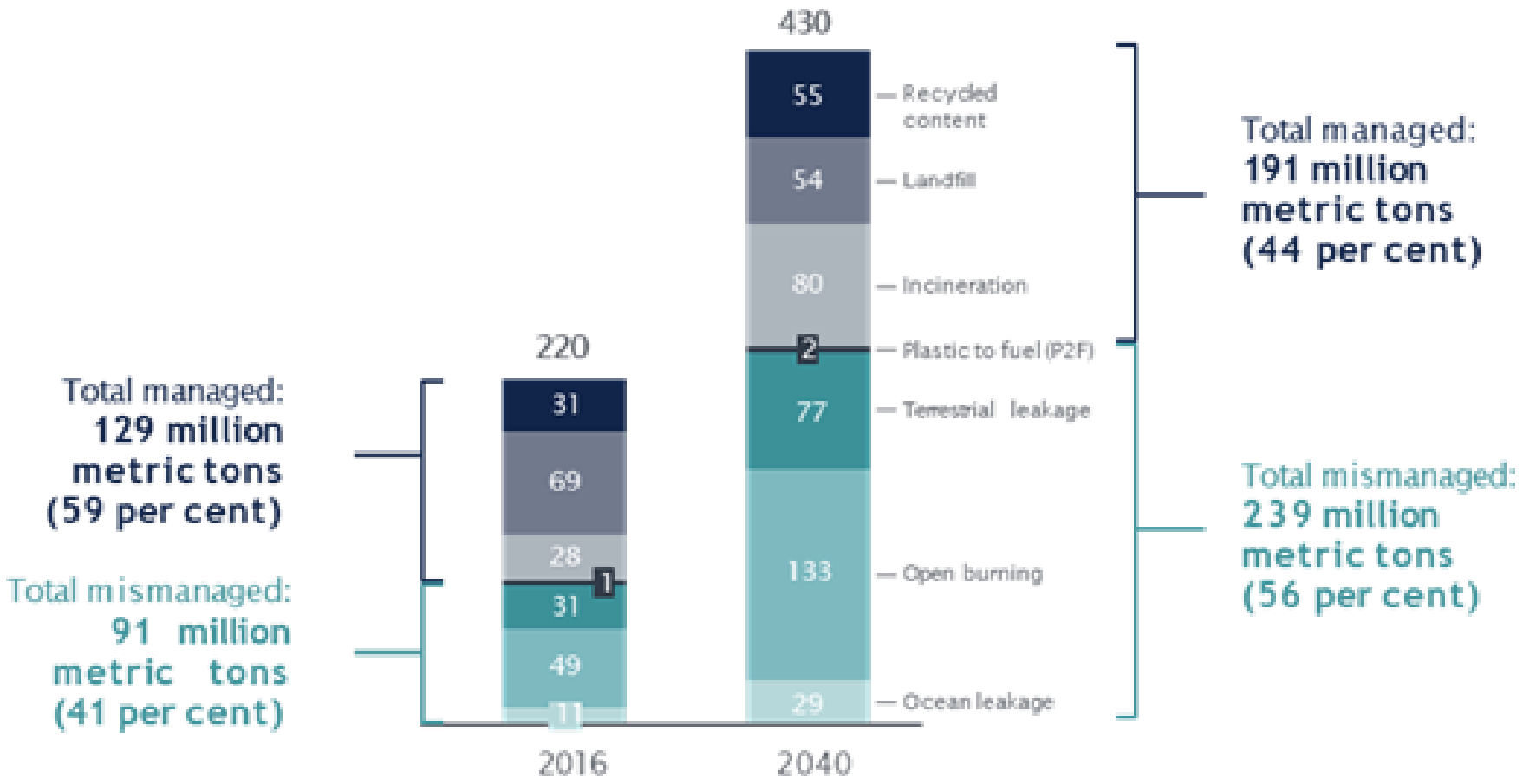
Source: Fraunhofer Institute 2018

Sources of microplastics (Germany): Fraunhofer

- Annual total per person 4,000g
- Construction total 117g
  - Demolition 90g
  - On-site processing 25g
  - Insulation materials 2 g

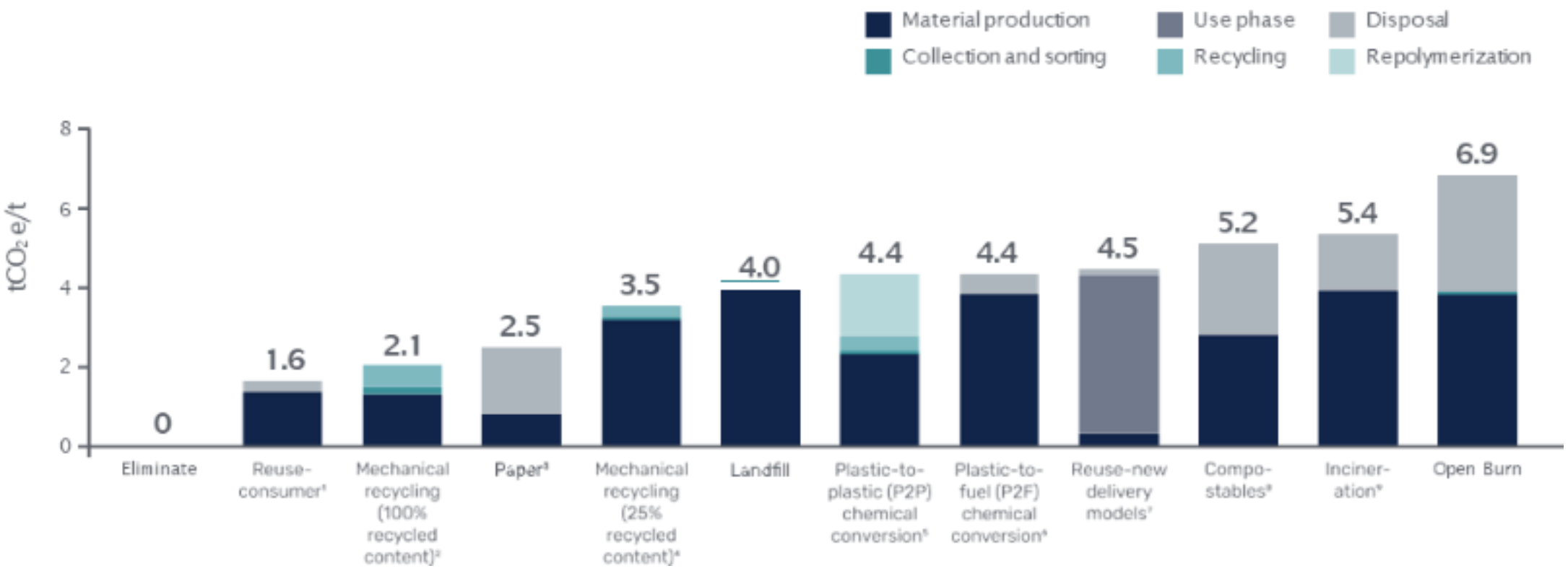
Source: Fraunhofer Institute 2018

Amount of mismanaged plastics is growing



Source: Pew Charitable Trusts and Systemiq Ltd, 2020

Landfill reduces GHG emissions of disposed plastics



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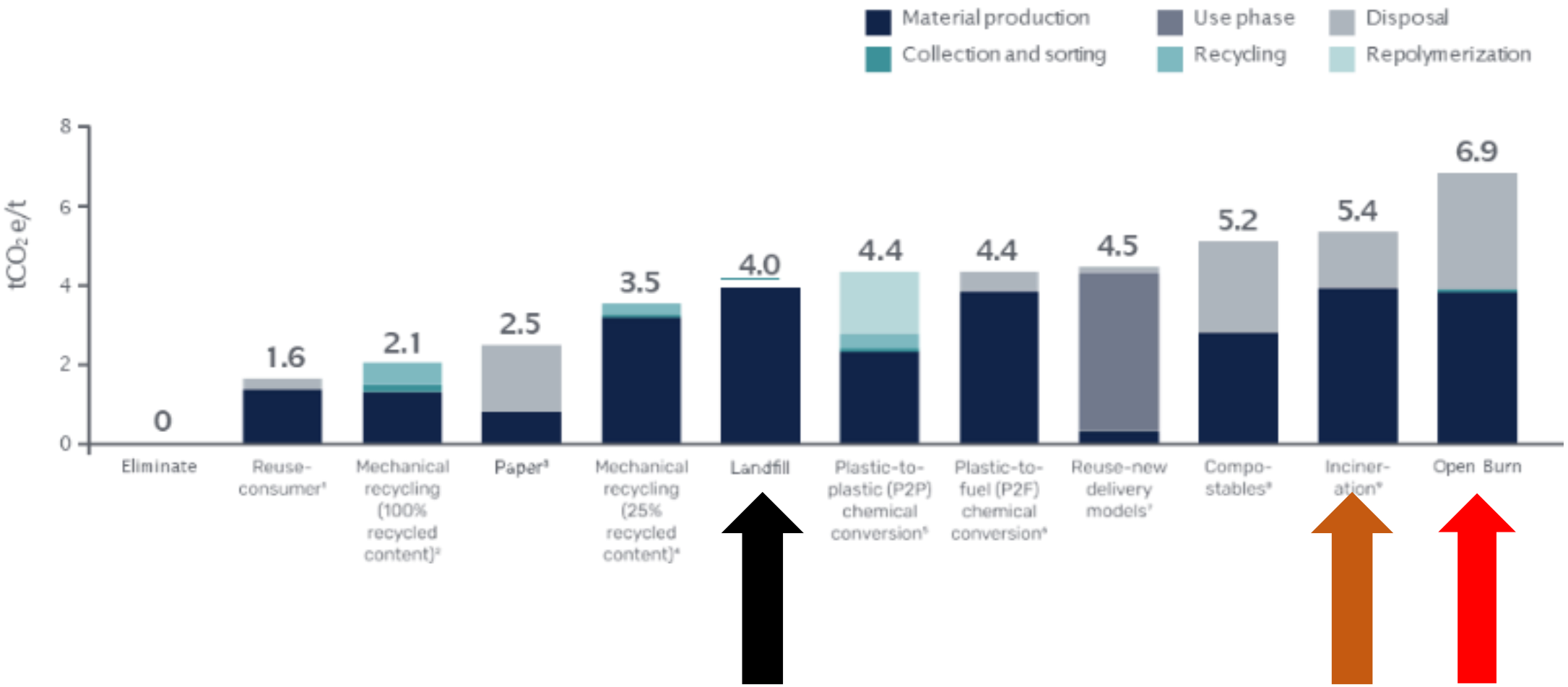
Landfill reduces GHG emissions of disposed plastics



Source: Pew Charitable Trusts and Systemiq Ltd, 2020

European Commission consultation

- Pellets
- Tyre abrasion
- Clothing textiles
- 85%

European Commission consultation

- Pellets
- Tyre abrasion
- Clothing textiles
- 85%
- Marine paints
- Washing capsules
- Geotextiles
- ?%

European Commission consultation

- Marine paints: Existing research
  Previously underestimated?
- Capsules: Limited/no research
  Plausible estimates: 20kT
- Geotextiles: ?

European Commission consultation: starting point

- “No barriers between geotextiles and the environment”
- “Any microplastics released directly into the environment”
- “Not disposed of when worn out”
- “Situation will likely worsen without policy action at the EU level”

European Commission consultation: IGS response

Baseline assumptions rest on:

- Unreliable estimates of geotextile volumes
  - “Drainage” versus “hydraulic”
- Misunderstanding of applications
  - Not exposed to UV
  - Not exposed to abrasion

Source: IGS response to EC consultation, 2022

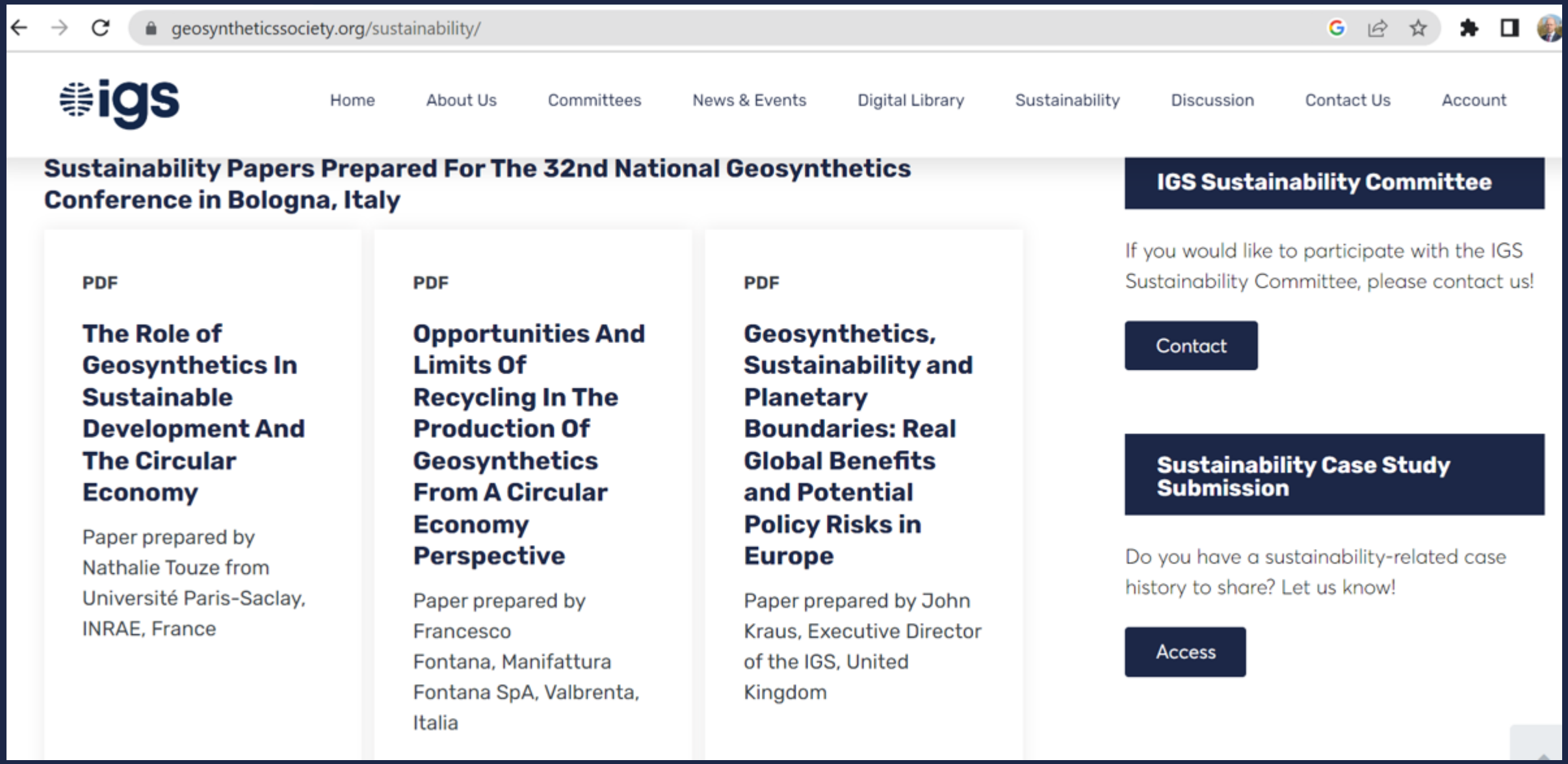
European Commission consultation: workshops

- Guidelines for correct use, installation and maintenance
- Ensure that materials are correctly specified for applications and durability
- Work with relevant industry groups to gather data
- End of life requirements to incentivise collection/recycling of used or damaged materials
- Develop standards for assessing (competing) solutions across the whole lifecycle
- Use biodegradable alternatives from secondary raw materials/waste
- Define appropriate testing protocols

Source: EC workshops, 2022

IGS Statement

“ Geosynthetics protect the environment. They play an essential role in the safe containment and management of waste materials. Geosynthetics provide many other benefits in applications that are long lasting and contribute to sustainable infrastructure, minimizing the use of natural resources. Numerous research reports confirm that the significant sources of microplastics are sources other than geosynthetics. We will continually strive to enhance the environmental benefits of geosynthetics and their valuable contributions to the UN Sustainable Development Goals.”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The Role of Geosynthetics In Sustainable Development And The Circular Economy
Paper prepared by Nathalie Touze from Université Paris-Saclay, INRAE, France
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Opportunities And Limits Of Recycling In The Production Of Geosynthetics From A Circular Economy Perspective
Paper prepared by Francesco Fontana, Manifattura Fontana SpA, Valbrenta, Italia
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Geosynthetics, Sustainability and Planetary Boundaries: Real Global Benefits and Potential Policy Risks in Europe
Paper prepared by John Kraus, Executive Director of the IGS, United Kingdom
IGS Sustainability Committee
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Sustainability Case Study Submission
Do you have a sustainability-related case history to share? Let us know!
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Thank You

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John Kraus
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