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Navigating risk factors for industry and consumer acceptance of sustainable solutions: The case of bioplastics

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Introduction

Biobased and biodegradable plastics are emerging as an alternative to conventional plastics (Notaro et al., 2022).

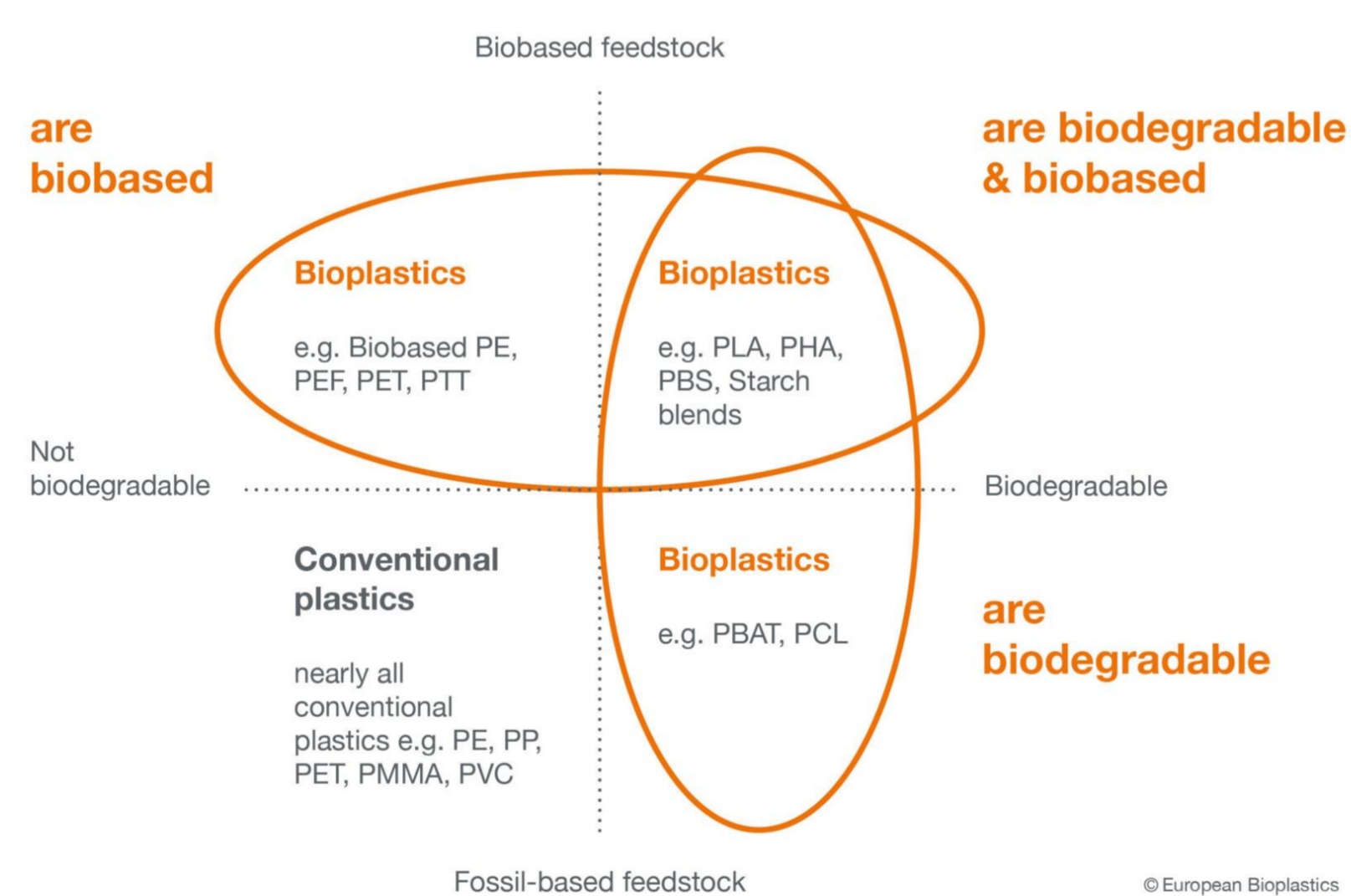
These hold the promise of a more sustainable alternative that promotes the circular economy, while reducing the dependency on fossil resources and the negative environmental impacts associated to conventional plastics (Bhagwat et al., 2020).

The success of bioplastics largely depends on industry and consumers acceptance, and on overcoming risk factors (i.e., barriers) that can threaten such acceptance (Findrik & Meixner, 2023; Weinrich & Herbes, 2023).

Knowing such risk factors is important to promote industry and consumer acceptance of bioplastics.

Material coordinate system for bioplastics

Bioplastics are biobased, biodegradable, or both.



Source: Institute for Bioplastics and Biocomposites (IBB) and European Bioplastics (EUBP)

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Objective

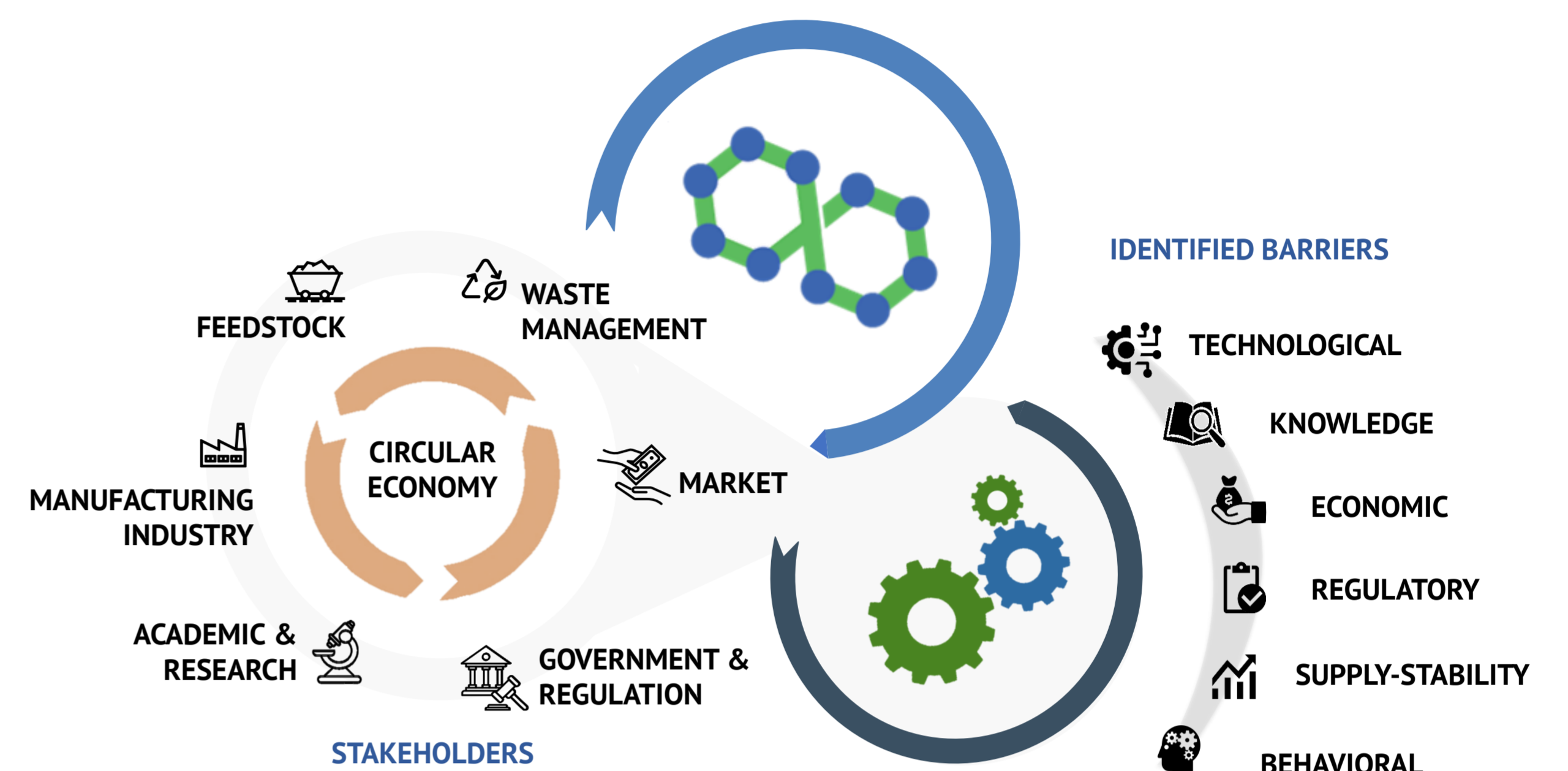
- Identify and summarize potential risk factors for industry and consumer acceptance of bioplastics.

Method

Two-Fold Approach:

- Systematic literature review** (176 papers) on supply-side barriers for commercialization of new biopolymer production technologies **enabled the identification of risk factors for industry acceptance.**
- Umbrella review** (63 papers) on barriers and recommendations to consumer demand for bioplastics **enabled the identification of risk factors for consumer acceptance.**

Results



Examples of Identified Barriers

Technological

- Physical and chemical properties of biopolymers
- Lack of specialized technology or equipment

Knowledge

- Lack of research and technical knowledge
- Difficulty differentiating bioplastics from other plastics

Economic

- High cost of raw materials and production technologies
- Perception of high cost and lower durability/quality

Regulatory

- Lack of public policies, regulations, and incentives
- Inefficient and deceptive labelling systems

Supply-Stability

- Scarcity and seasonality of specific raw materials
- Competition from other industries for raw materials

Behavioral

- Industry resistance to change and uncertainty
- Risk perceptions, misconceptions, and high expectations

Conclusion

- Results highlight critical risk factors threatening industry and consumer acceptance of bioplastics, potentially hindering business growth and market demand.
- Understanding these risks can enable the development of effective strategies to promote industry and consumer acceptance.

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