

The role of biodegradable plastics in tackling plastic waste

Challenges and potential solutions

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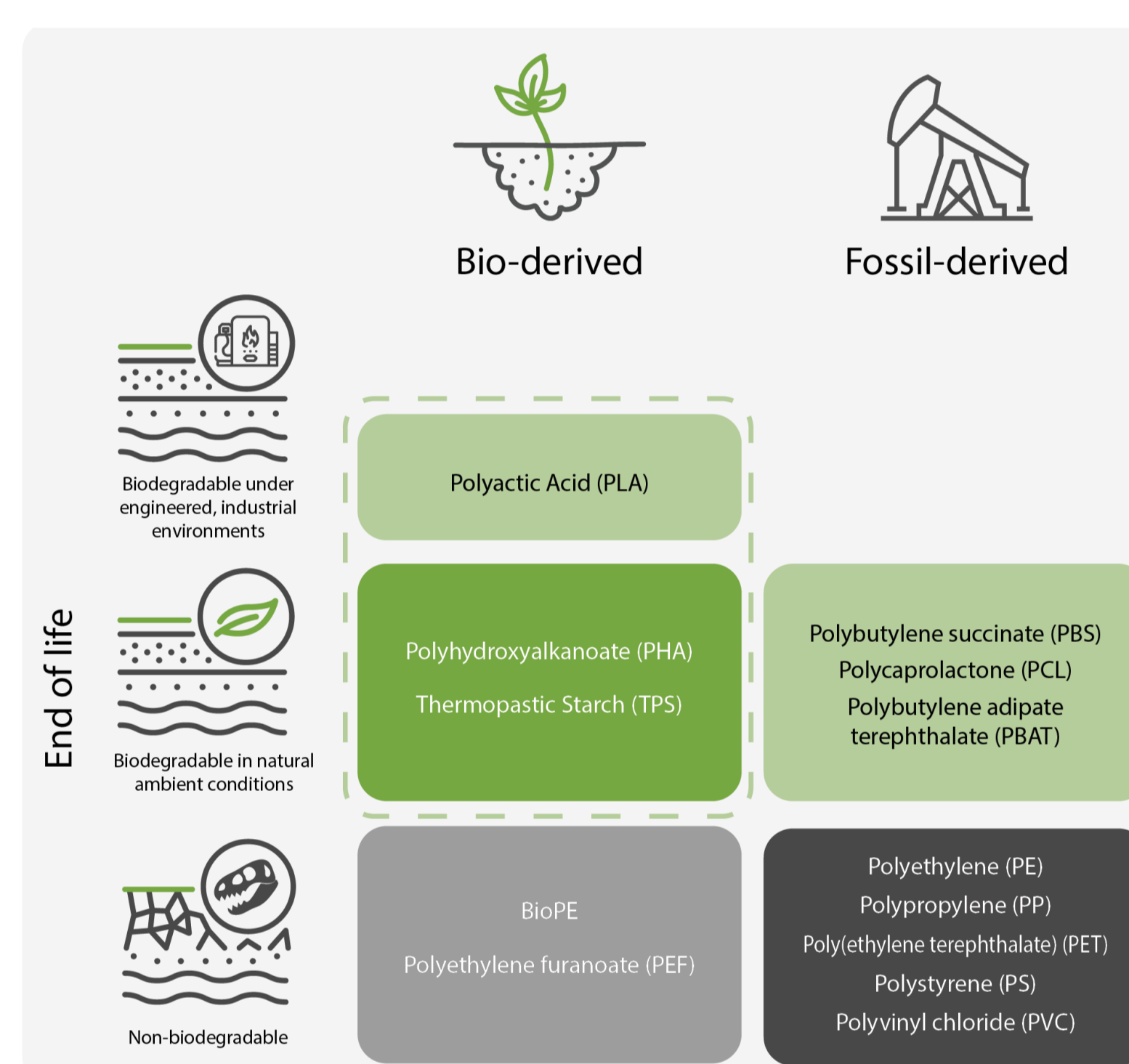
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Biodegradable plastics present a potential solution to some of the issues relating to plastics, although there are a number of challenges that mean that the scope and role of biodegradable plastics in an increasingly circular economy is not straight forward.

The key issues associated with the concept of 'biodegradability' in relation to plastics.

1. Confusion in terminology and labelling

- Imprecise and poorly understood environmental claims and symbols on products result in confusion.
- Commonly used terms (e.g. 'bioplastics', 'biodegradable', 'bio-derived') are used interchangeably, and lack clarity.
- Part of a broader trend that has seen green claims increasingly used to promote products, leading to widespread concerns about greenwashing.



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Figure 1: Classification of polymers, noting all but the dark grey (bottom right) are considered 'bioplastics'

2. Lack of clear policy and regulation

- Lack of clear policy (from all levels of Government) on the meaning and role of biodegradable plastics in the push towards circularity.
- Inconsistent use of and inadequate definition of the term 'biodegradability' in existing laws, often limited to certified compostable plastics or not defined or referred to at all.
- Limited regulation of 'biodegradability' related claims, with experience to date suggesting that general consumer laws may be unable to offer protection that aligns with consumer expectations.

3. Limitations on waste management options

- There appears to be limited waste management options that are suitable for, available, and willing to receive biodegradable plastics right now.
- The relationship between 'compostable' labels and waste disposal recommendations is not well understood.

4. Unintended consequences

- Biodegradable plastic products often comprise a biopolymer matrix with solid filler/s and/or additives as they offer cost-competitiveness and better utility. However, these fillers and/or additives can impair biodegradability, and depending on toxicity, may adversely impact the environment.
- 'Biodegradability' may inadvertently encourage 'leakage' through littering, leading to environmental harm.

A multi-faceted approach is required to address these challenges.

1. Scientific research to improve the understanding of biodegradation processes across environments

- Build knowledge about the impact of trace ingredients (in terms of biodegradability and ongoing environmental effects).
- Research to support development of credible assessment tools and scalable waste management services for biodegradable plastics.

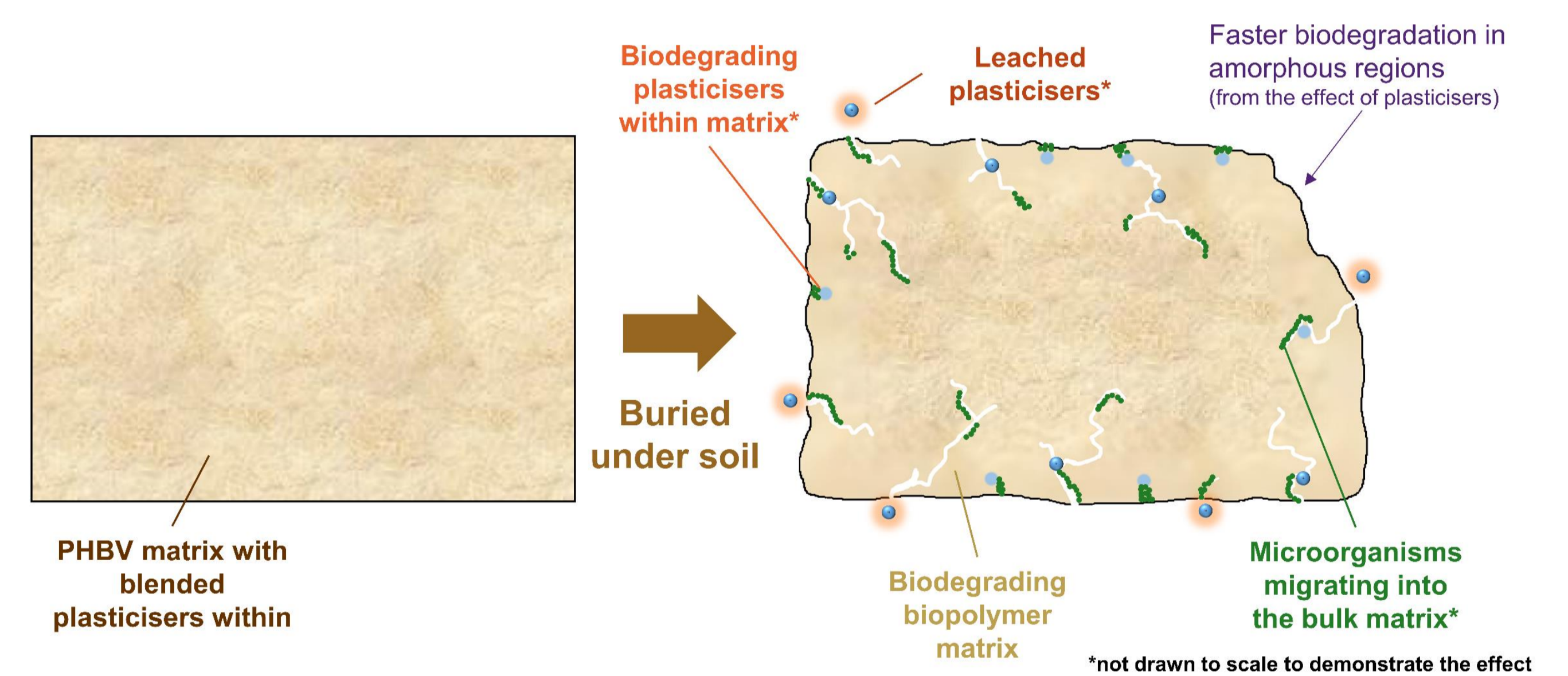


Figure 2: Schematic showing the biodegradation mechanism of the impact of plasticisers, highlighting the chemical, physical and microbial effects.¹

2. Information awareness campaigns

- There is a need to build information awareness around the meaning of terms, the circumstances in which biodegradable plastic products are a sustainable option, and what is (and is not) suitable waste management behaviour.
 - E.g. Education about voluntary compostable certifications enables consumers to make informed choices.



Figure 3: Current voluntary certification schemes for compostable plastics in Australia

3. Trustworthy quality assurance measures such as standards and labelling systems, and compliance enforcement through regulations.

- Quality assurance can build confidence when it is reliable, transparent, accountable, and robust.
 - Current standards should be reviewed to ensure that they adequately account for the impact of trace ingredients (<1%).
 - New standards should be considered for other biodegradation environments (e.g. marine).
- Legislative reform could clarify the position on biodegradable plastics in the push towards circularity, and clarify the meaning of key terms. Consideration should also be given to establishing an agreed taxonomy, and mandating certification.