



WP4. Techno-economic assessment - Alternative EoL options



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Goal and Scope

The aim of this work is to present a techno-economic sustainability analysis methodology (TESA) for each major End-of-Life (EoL) route of bio-based products with emphasis placed on bio-based plastics, and to define techno-economic sustainability criteria and indicators for the alternative EoL of post-consumer/industrial bio-based plastics.

The main considerations taken into account were:

- The **prioritised alternative EoL routes** according to the hierarchy of the Circular Economy Package (CEP) (Fig. 1)
- Emphasis placed on the **recirculation potential** of the products of alternative EoL options, in support of the emerging circular bioeconomy (*materials recovery options*).

End-of-Life alternative options in hierarchy

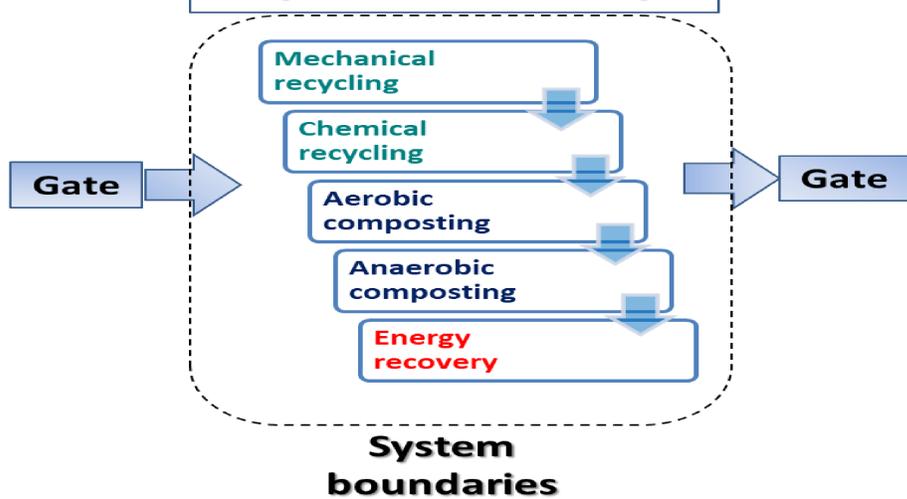


Figure 1. Prioritised alternative EoL routes according to the hierarchy of the Circular Economy Package (CEP)

Methodology

- The development of the techno-economic sustainability analysis (TESA) methodology for the post-consumer and post-industrial stage of bio-based products has been based on three preliminary inventory analysis steps, followed by the definition of TESA principles and the development of techno-economic sustainability criteria and indicators in two further steps.
- The TESA for the EoL of *post-consumer/post-industrial bio-based products* is verified through its implementation in selected case studies (Fig. 2)

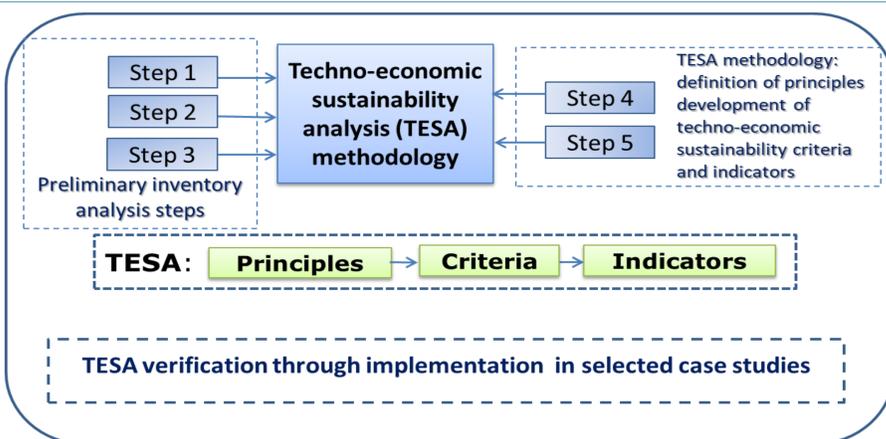


Figure 2. TESA Methodology

WP4 partners

- EoL routes



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Results

Principle 1: Techno-economic sustainability of alternative EoL routes

Principle 2: Recirculation potential

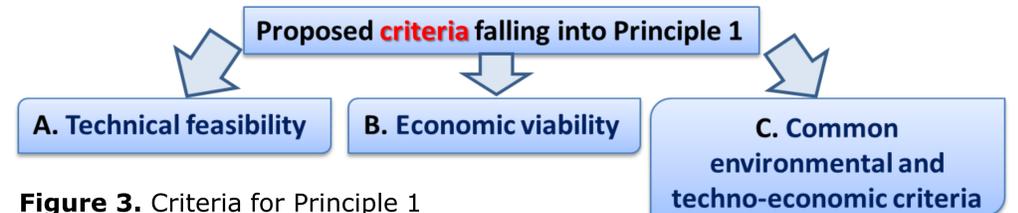


Figure 3. Criteria for Principle 1

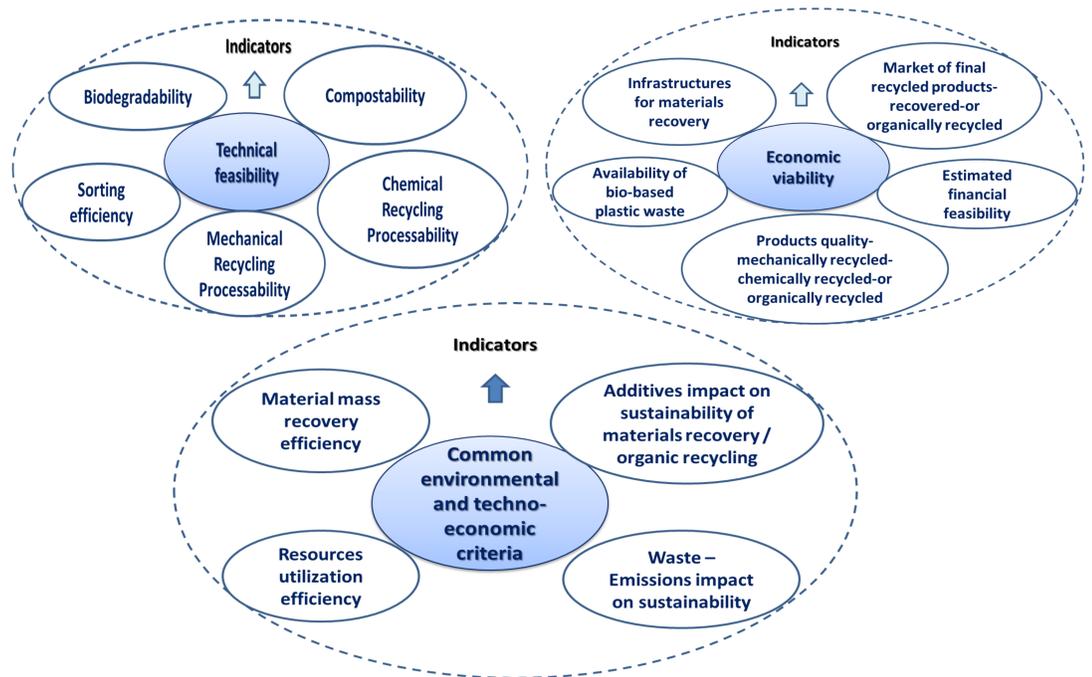


Figure 4. Indicators for criteria of Principle 1



Figure 5. Criteria for Principle 2

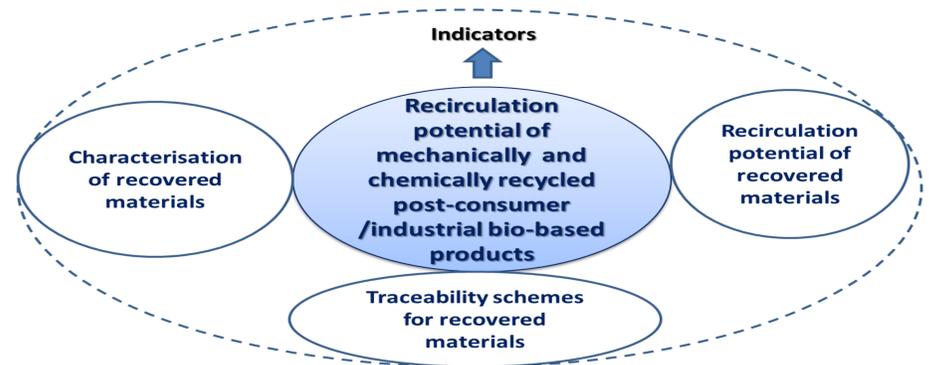


Figure 6. Indicators for criteria of Principle 2

Conclusion

A methodology was developed for the TESA of the alternative EoL routes of post-consumer bio-based products. Criteria and indicators are proposed for each major EoL route.

References

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2. D. Briassoulis, A. Koutinas, J. Gołaszewski, A. Pikasi, D. Ladakis, M. Hiskakis, M. Tsakona, Techno-economic Sustainability Assessment: Methodological Approaches for Biobased Products. Chapter 4 in book: Green Transition Towards a Sustainable Biobased Economy, Edited by P. Morone and J.H. Clark, Chemistry Series No. 64, The Royal Society of Chemistry, 2020, www.rsc.org



This project is funded by the European Union's Horizon 2020 Research and innovation action under grant agreement No 727740 with the Research Executive Agency (REA) - European Commission. Duration: 36 months (May 2017 – April 2020). Work Programme BB-01-2016: Sustainability schemes for the bio-based economy.

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