



Integrated Assessment Tool (IAT)



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Purpose

The IAT delivers methodological guidance for conducting an integrated assessment of bio-based products addressing, from a life cycle perspective, their most relevant sustainability aspects. IAT enables companies to conduct internal sustainability assessments of their bio-based products for benchmarking, eco-design and sustainability qualification purposes, also in respect to the achievement of SDGs. IAT is accompanied by a scoring system that allows to quantify how well a bio-based product performs compared to an "ideal performance". IAT has a strong focus on applicability and business relevance making it a versatile and effective tool for supporting the transition towards sustainable production and consumption within the bio-economy sector.

IAT Elements

The IAT translates innovative developments from different STAR-ProBio Work Packages (WP2, WP3, WP4, WP5, WP6, WP7) into an **applicable integrated assessment tool**, consisting of **48 indicators** (qualitative and quantitative) associated to **24 principles** and **10 Sustainable Development Goals (SDGs)**. The IAT consists of the following elements: i) IAT Matrix (list of principles, criteria and indicators); ii) Related metrics, methodologies and standards; iii) Guidance on how to apply the tool; iv) A scoring system; v) A communication template (Figure 1)

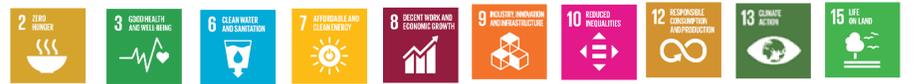
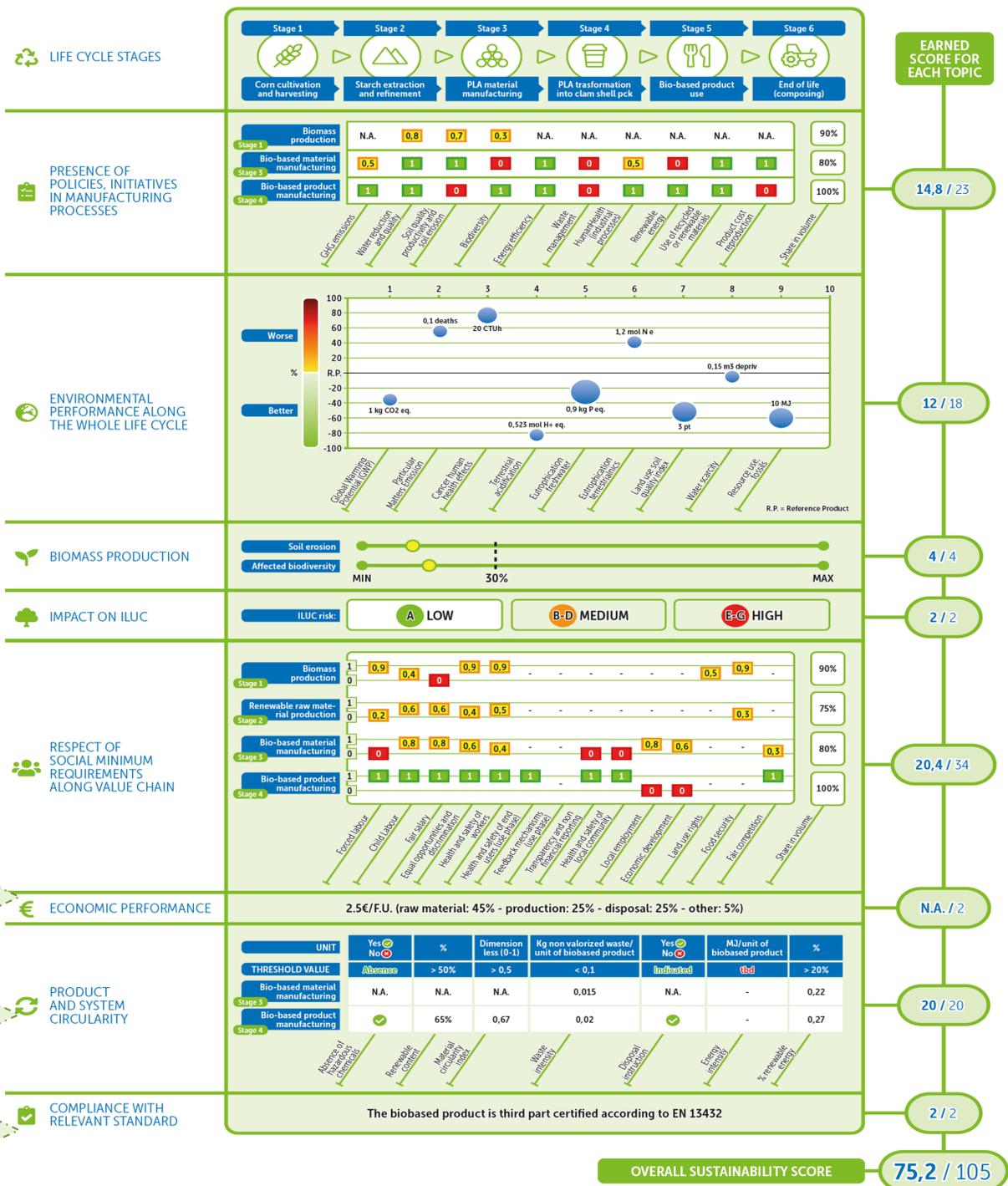


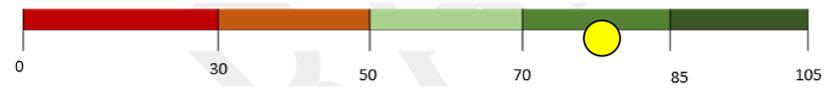
Figure 1: Sustainability assessment results of a bio-based product according to the IAT communication template

- Section 1:** schematic life cycle stages of the bio-based product
- Section 2:** presence of policies and/or initiatives. This section measure the commitment of companies in addressing **ten** relevant sustainability topics regarding environment, circularity and economic. Qualitative indicators. 1 means the company has in place a policy, 0 none.
- Section 3:** Life Cycle Assessment. Overall **nine** LCA indicators are determined for the bio-based product and compared to a Reference Product. (Quantitative indicators). The lowest the best.
- Section 4:** biomass production. **Two** semi quantitative indicators related to affected biodiversity and soil erosion.
- Section 5:** ILUC risk estimated using the risk tool developed by UNIBO (database).
- Section 6:** social aspects. The fulfillment of the minimum social requirements for **fourteen** social indicators are investigated. (Qualitative - yes/no condition).
- Section 7:** Life Cycle Costing (LCC) assessment performed in parallel with LCA analysis. (Quantitative).
- Section 8:** Circularity. Overall **seven** quantitative and qualitative indicators have been defined for addressing the product and system circularity.
- Section 9:** Presence of relevant standards related to the specific bio-based product category.



LEGEND
 Red: weak performance (action urgently needed)
 Orange: low performance (action needed)
 Light green: good (minor action needed)
 Medium green: very good (minor action needed)
 Dark green: outstanding

The obtained score is compared to the scale below. In this way the applicant can visualize the overall performance and assess the necessary actions



Publications
 1. F. Razza et al. (2020). Metrics for quantifying the circularity of bioplastics: the case of bio-based and biodegradable mulch films. *Resources, Conservation & Recycling*, Special Issue on "Sustainable Cycles and Management of Plastics".



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