

## Introduction

The Deposit Refund System (DRS) presents substantial advantages across diverse sectors, particularly in fostering sustainability and enhancing economic efficiency. Since its inception on 1 February 2022, Latvia's container DRS has demonstrated remarkable progress. As per the data provided by the Latvian DRS operator, the return rate has escalated from 62% in 2022 to 83% in 2024, signifying a favorable transformation in consumer behavior.

Initially, the DRS was conceived as a mechanism for behavioral modification, utilizing economic incentives. Participants are granted an exemption from the natural resource tax and are instead obligated to pay a DRS membership fee. Nevertheless, a pertinent inquiry persists: do either of these **fiscal contributions – the natural resource tax or the DRS membership fee – sufficiently account for the environmental repercussions associated with the operational aspects of the system?**

## Methodology

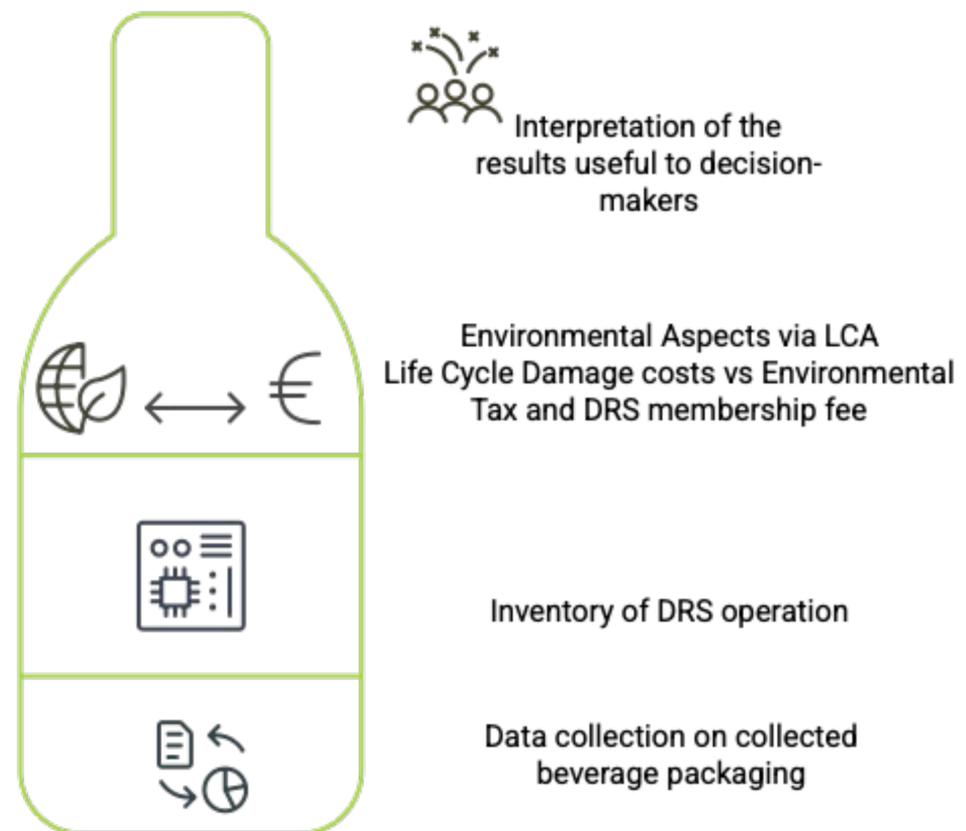
This research evaluates Latvia's DRS performance over its initial two years using the damage cost methodology. The analysis compares environmental tax and DRS fees with the actual environmental damage costs from packaging waste management, e.g. collection, transportation and recycling. The methodology comprises three primary steps:

**1. Life Cycle Impact Assessment (LCIA):** The environmental impact of recyclable beverage containers was assessed for 2022 and 2023 using LCIA indicators based on the ReCiPe 2016 Midpoint (H) method, measured in kilograms.

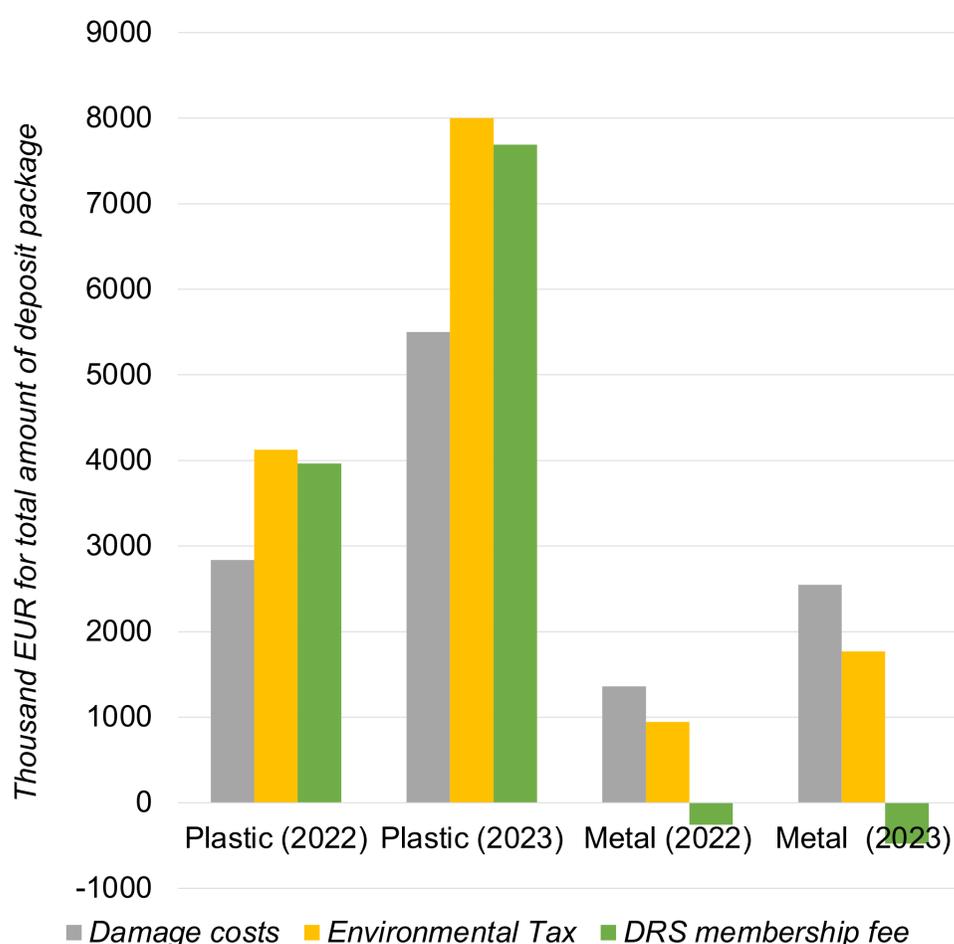
**2. Conversion to Monetary Values:** The environmental impacts from the LCIA were converted into monetary values through the Life Cycle Damage Cost assessment, facilitating a comparison between environmental impacts and economic metrics.

**3. Comparison with Existing Fees:** The calculated environmental damage costs were juxtaposed with the applicable environmental tax rates and DRS fees to evaluate if financial instruments reflect the environmental costs of the DRS system.

*\*Glass packaging was excluded from the study, as the current DRS data collection system does not distinguish between glass collected for material recovery and that intended for reuse.*



## Results



## Conclusions

This research proposes a methodology for evaluating the adequacy of environmental tax rates and DRS membership fees applied to packaging collected and processed within the DRS. The approach integrates LCA indicator-based analysis with Life Cycle Damage Cost assessment. This methodology was applied to the Latvian DRS, which has been in operation since 2022.

The results indicate that for **plastic packaging**, the combined revenues from the environmental tax and DRS membership fee sufficiently cover the associated environmental damage costs from collection and treatment. In fact, these financial contributions exceed the calculated damage costs by 28–31%, suggesting a solid foundation for the system's continued development and potential reinvestment in system improvements.

In contrast, for **metal packaging**, the environmental damage costs exceed the monetary value recovered through the environmental tax and DRS membership fee. Notably, the DRS membership fee for metal packaging is already negative, reflecting the DRS operator's interest in promoting the recovery of metal due to its high material value.

This discrepancy highlights a methodological consideration: **future assessments should expand the system boundaries to account for avoided environmental impacts** resulting from the reuse or recycling of materials, which could significantly affect the overall cost-benefit balance of the DRS.