

# Bioavailability, complex substances and overall persistence (BCOP): three themes to deliver a step-change in persistence assessments – Overview of a CEFIC-LRI project (ECO52).

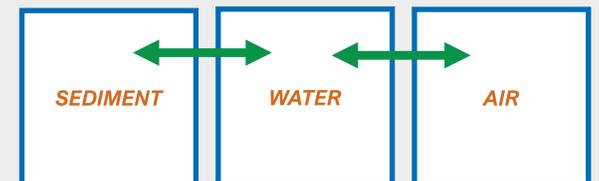
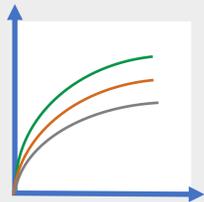
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This is a 2-year project, launched in March 2020, in response to the CEFIC-LRI ECO52 request for proposals (RfP): Expanding the conceptual principles and applicability domain of persistence screening and prioritization frameworks, including single constituents, polymers, and UVCBs.

## INTRODUCTION

- Persistence assessment is a cornerstone of chemical hazard and risk management. However, established persistence assessment frameworks have shown some opportunities for improvement.
- Environmental degradation of chemicals is a complex process leading to potential wide variation in measurable half-lives. **Measures to reduce and account for this variability are lacking.**
- Certain types of substances have been demonstrated to be **problematic or outside the applicability domain** of existing frameworks and protocols due to their specific properties.
- Assessing persistence on a compartment-by-compartment basis **does not consider dynamic processes of environmental partitioning**, which play an important part in removal from the environment.



**AIMS:** To develop recommendations to enhance the current persistent assessment framework by incorporating:



- Guidance for difficult substances such as UVCBs and polymers (including microplastics);
- An approach to account for multi-media partitioning and its impact on overall persistence;
- A revised persistence assessment weight-of-evidence framework and decision tree, that can be applied for the future assessment of substances.

Improvements to the assessment framework will follow 3 principal themes:

Consideration of bioavailability

Guidance for complex substances

Incorporating overall persistence

## OVERVIEW OF WORK PACKAGES

### 1 Literature review

Covering the persistence concept, assessment frameworks and protocols (with focus on EU REACH), UVCBs, polymers and microplastics, and multimedia fate modelling approaches.

### 2 Guidance development on substance types

Will focus on difficult-to-test substances, UVCBs, and polymers and microplastics. The importance of bioavailability will be used as a guiding principle to aid test design and interpretation of results in weight of evidence.

### 3 Modelling work

Will perform a series of exercises to calculate overall persistence with the aim to improve confidence in these approaches. Will address different kinds of test substances (general substances difficult-to-test substances, UVCBs and polymers). Will also include guidance development on how multimedia modelling and overall fate can be incorporated into persistence assessment.

### 4 Comparison between natural & synthetic polymers

Will assess similarities and differences in degradation behaviour and mechanisms between natural and synthetic polymers.

### 5 Framework & decision tree

Will pull together all elements of the project into a proposed updated assessment framework that delivers:

- Improved guidance on weight of evidence determination, incorporating bioavailability and critical processes
- Provisions for the assessment of substances currently problematic or outside the applicability domain of persistence frameworks
- A workable methodology for incorporation of multimedia fate modelling and overall persistence

Will also include a decision tree to help determine an appropriate testing and assessment approach depending on the nature of the substance.

The project intends to develop recommendations to enhance the current persistence assessment framework by improving guidance on weight-of-evidence determinations and expanding applicability to a broader range of substance types.

Acknowledgement: Eleonore Delouvrier (Ricardo Energy & Environment, UK)