



Biological effect analysis for the use of waste as raw material

The aim of the project has been to develop methods for new test procedures to improve the link between specific exposure and efficacy of HP14 evaluation, ecotoxicological risk which is the fourteenth of the EUs 15 designed properties in the package for circular economy class where waste can be converted into products and at the same time put restrictions on use.

In the completed pilot project in the Re: Source call in 2016, we have worked with four tasks to investigate whether it is possible to improve risk analysis of waste to enable recycling of products.

The four tasks were

1. Evaluation of existing regulations
2. Evaluation and proposed treatments for the two model substances, fines and bottom ash
3. Evaluation of biological analysis
4. A formulation of strategy for further development of the biological methods for risk analysis

Uncertainties in the EU Directive

In task 1 the existing regulatory framework for the management of waste were evaluated.

The existing legislation showed that there are still uncertainties in how the example EU Directive (EU1527 / 2014) HP14 should be interpreted. In the current situation there are no guidelines or developed analytical methods for in a significant way to ensure when a waste is hazardous or not based on the ambition to use materials / waste in the most optimal way possible. Further, it potentially makes assessments on whether different wastes poses a risk or not very different both between member states but also between regulators within the same country.

In order to develop new basis for risk analysis of HP14, we investigated whether a newly developed method, based on analysis of the expression of

marker genes, could be a possible way forward to improve the basis for risk analysis. This required that we performed a pilot study.

In task 2 we performed leaching of two materials, fines, flyash for use in biological assays in task 3. Results from these studies showed that there is lack of matches between the chemical characterization methodology used today and the biological response obtained with marker genes that are designed to demonstrate the links between specific exposure and effect.

Environmentally relevant biological analysis tools

These results show that there is a basis for developing the new methods as these provide a stronger connection between a waste components and the impact that they, each one contributes to.

Based on this, we will proceed with the work to develop new environmentally relevant biological analysis tools for improved risk analysis for the use of waste to facilitate the use in specific applications and products.

Project facts

Project name: Biological effect analysis, for the use of waste as raw material

Keywords: HP14, biological risk analysis, ecotoxicology, circular economy, model system

Project period: August 2016 to February 2017

Project leader: Per-Erik Olsson, BiolImpakt AB

Project participants: Stena Recycling International AB, DGE AB, Miljötekniskt Centrum AB, Envix Nord AB, Örebro universitet