

Joint statement from Clean Production Action and the Danish Environmental Protection Agency on use of GreenScreen® for Safer Chemicals in the report on “Environmental and Health Screening Profiles of Phosphorous Flame Retardants” (Danish EPA Environmental Project No. 1823, 2016)

As part of its work to support identification and evaluation of safer product chemistries, the Danish Environmental Protection Agency (EPA) recently released a report providing “environmental and health screening profiles” for 28 phosphorus flame retardants using GreenScreen® for Safer Chemicals (GreenScreen) as the underlying framework for hazard assessment. The aim of the project was to identify halogenated flame retardant replacements, with a specific focus on phosphorus alternatives, develop “screening level” hazard profiles for those alternatives and to evaluate whether a European hazard screening approach based on GreenScreen could be established. The Danish EPA sponsored the report, which was conducted by the consultancy, COWI A/S. The report concluded phosphorus flame retardants are available for the major applications of halogenated flame retardants, and provided information on applicability for different substrates, end applications and flame retardancy.

The Danish EPA project endorsed GreenScreen as relevant and applicable to hazard assessment in the European regulatory context, with what were considered “relatively minor” adaptations to the method. Adaptations were based on both European regulation and in consideration of the consumer exposure focus of the investigation. As part of its assessment of the flame retardants, COWI A/S changed the GreenScreen Benchmark Criteria, Hazard Criteria, and Specified Lists; these changes are considered by Clean Production Action to be more than minor in nature. Key modifications included:

- Omission of the flammability and reactivity physical hazard endpoints, as they were considered irrelevant in the consumer product context of the Danish EPA project;
- Utilizing different criteria for endocrine activity assessment by referring to the EU list of potential endocrine disruptors based on the EU ED criteria for prioritisation and from the OECD Conceptual Framework for substances, in comparison to GreenScreen which uses a review of authoritative hazard listings, the scientific literature and a weight of evidence approach to assign a hazard classification¹;
- Use of the European CLP to define hazard criteria for human health endpoints, versus the GHS Guidance and Criteria²;
- Changes to some numeric criteria used to assign hazard rankings affecting the moderate, low and very low rankings and raising the lower threshold for the high ranking on bioaccumulation to adapt to a European regulatory context; and

¹ In GreenScreen, chemicals listed by the European Union as Substances of Very High Concern subject to Authorisation (Annex XIV of the REACH Regulation) due to endocrine activity are assigned a high hazard classification.

² GreenScreen includes additional hazard categories for acute mammalian toxicity (Category 5), skin irritation (Category 3), and eye irritation (Category 2B) based on GHS (Global Harmonized System of Classification and Labelling), which are not included in CLP (Classification, Labelling and Packaging). These categories affect the moderate and low hazard rankings.

- Changes to list-based data sources required to be reviewed as part of the assessment process, such as, omitting other country-specific GHS implementations and non-US federal evaluations and adding the European C&L inventory including industry's self-classifications.

Questions are being asked whether the hazard assessments in the Danish EPA report replace or supersede existing published GreenScreen assessments. The Danish EPA and Clean Production Action would like to jointly clarify that the hazard profile scores published in the Danish EPA report do *not* replace previously published GreenScreen Benchmark™ scores based on the GreenScreen® for Safer Chemicals assessment method. Clean Production Action only considers GreenScreen Benchmarks resulting from assessments following the GreenScreen Guidance and Resources as to be valid scores for use in standard and certification frameworks that have chosen to incorporate GreenScreen.

Publicly-available GreenScreen assessments for flame retardant substances and other chemicals are available for download from Clean Production Action's [website](#). The Danish EPA report can be downloaded from the Danish EPA's [website](#).

Clean Production Action invites input from stakeholders around the world to continue to improve the GreenScreen method. Danish EPA will continue its work to identify safer substitutes to substances of very high concern.