



## Scientific consensus

In 2006, the UNEP/SETAC Life Cycle Initiative comprehensively compared life cycle impact assessment toxicity characterization models with the ultimate goal to harmonize existing models and recommend one approach. This process brought comparative risk assessment specialists and life cycle scientists together to find scientific consensus on a model that was:

- parsimonious, containing only the most influential model elements
- transparent and well documented
- falling within the range of the existing characterization models
- backed by modellers of all participating models
- capable of modelling a typical situation involving chemical emissions taking place in any part of the world.

The harmonization effort ran over several years and involved many external experts in environmental chemistry and human and ecotoxicity. From this collaboration, was born the USEtox™ model.

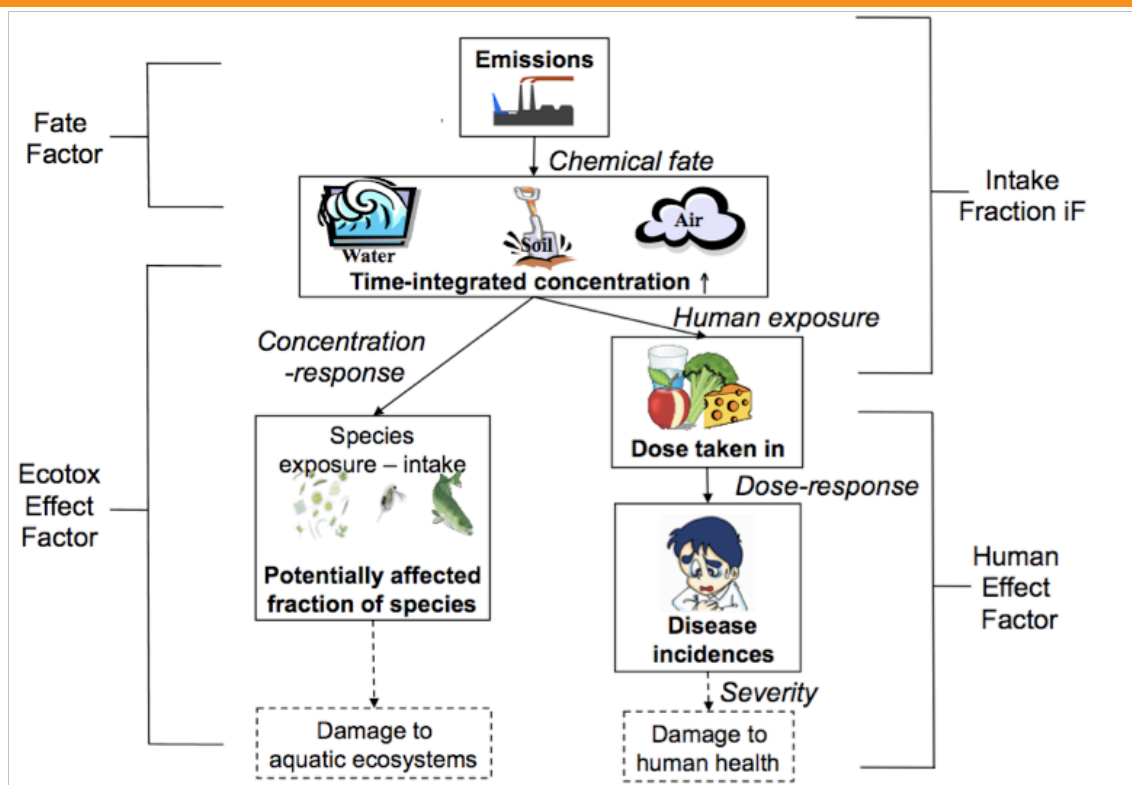
## The USEtox™ model

The USEtox™ model was released in 2010 as an Excel model with recommended characterization factors for 1000 substances for human toxic impacts and for 1300 substances for freshwater ecotoxic impacts. In addition, interim factors (where model or substance data are of insufficient quality to support recommendation)

are provided for 250+ substances for human toxic impacts and for 1250 substances (including metal compounds) for freshwater ecotoxic impacts. With the release of the model there is also the possibility to calculate factors for additional substances.

The USEtox™ model is of particular relevance to the management of chemicals, as it provides a harmonized approach to assessing and evaluating risks from chemicals embedded within products. LCA practitioners can use the model's characterization factors to identify the most important toxic substances for a particular product, but the large inherent uncertainty of the factors has to be respected. Substances scoring 1%, 5% or 90% of the total human toxicity score should be considered comparable, but significantly worse than substances contributing less than one thousandth. This way, the practitioner can identify 10 to 20 priority chemical emissions and perhaps more importantly, disregard the hundreds of other substances whose life cycle impacts are insignificant. The improved representation of chemicals in LCA provided by the USEtox™ model can help obtaining information about the impacts from the majority of chemicals that are not part of risk assessment or management regulatory schemes, assist in "greening" the use of chemicals in industry and industrial products, and will ultimately reduce the current overall chemical pressure on the environment through the greening of the products in whose life cycle they are used.

# USEtox™ FRAMEWORK



The framework of the USEtox™ model supports a parallel modelling of human toxic and ecotoxic impacts including a joint fate modelling and separate exposure (for humans) and effect modelling.

*«The consensus USEtox™ model couldn't come at a better time. With increased interest by industry, academics and government in Life Cycle Assessment, the need for an harmonized, transparent and thorough model that characterizes the fate, exposure and effects of chemicals is paramount. The UNEP is very proud to have participated in the development of this model with the USEtox™ team and encourages its use by businesses and governments.»*

*- Dr. Guido Sonnemann, UNEP*

## Collaborations

The USEtox™ team invites partners from industry or authorities to collaborate on:

- Workshops to introduce and train the participants in use of the USEtox™ model
- Calculation of characterization factors for other substances
- Development of cases demonstrating the relevance of
  - o looking at chemicals in a life cycle perspective (e.g. chemical substitution)
  - o including impacts from toxic substances in life cycle assessments



## To collaborate

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**For more information on USEtox™**

[www.usetox.org](http://www.usetox.org)