



ADVANCED LIFE CYCLE IMPACT ASSESSMENT

- **Course subject:** A deep dive into the modelling aspects involved in the life cycle impact assessment (LCIA) phase of LCA studies. Practical exercises on designing impact pathways and models from inventory indicators (stressors) to midpoint and endpoint characterisation, using examples from both well-established and emerging impact categories, and with a special view on the uncertainty associated with LCIA. New trends in LCIA modelling, with a focus on spatial and temporal differentiation.
- **Course outline:**
 - Historical examples of how environmental impacts and pathways were discovered, top-down assessment of their importance, biogeochemical flows and the role of human technology.
 - Interaction between impact pathways, synergies, parallel and serial impacts, risk of double-counting. Importance of background levels and abatement of impacts.
 - Criteria to distinguish good modelling practice from bad. Empirically based versus theoretically based models. Epidemiological models versus cause-effect models. Ways to construct impact pathways bottom-up and top-down. Models that are open for improvement.
 - Digging deeper into the differences between the impact pathway models of existing ready-made LCIA methods: What are the causes for the differences and how can these be overcome? We look in particular on toxicity, land use/water use and resource use.
 - Exercises on understanding and designing impact pathway models for specific impact categories, chosen among both well-established and emerging impact categories, according to the interests of the participants: Fate and exposure modelling, effect modelling and category indicators at midpoint and endpoint, correct design and calculation of characterisation factors.
 - Trends in LCIA: Modelling spatial differentiation in fate, exposure, and ecosystem sensitivity. From risk assessment to global modelling. Exercise: Practical approaches to include spatial variation in current LCIA models.
 - Trends in LCIA: Modelling temporal variation and delay in impacts. Exercise: Practical approaches to include temporal variation and timing of impacts in current LCIA models.
 - Identifying and quantifying uncertainty in impact pathway modelling. Sanity checks of model results.
- **Teaching staff:**
 - Dr. Ralph Rosenbaum, Industrial Chair ELSA-PACT Montpellier, France
 - Prof. Bo Weidema, Aalborg University, Denmark
 - Prof. Manuele Margni, CIRAI, Canada
 - Michael Hauschild, Technical University of Denmark (DTU), Denmark
- **Learning outcomes:** Advanced understanding of impact assessment modelling. Ability to distinguish good and bad modelling practice and to describe an impact pathway in a systematic way, including correct design and calculation of characterisation factors. Understanding of the importance of and practical approaches to include spatial and temporal aspects in an LCIA. Ability to calculate LCIA results taking uncertainty into account.
- **Dates:** 17-19 January 2018
- **Location:** ESCI-UPF, Passeig Pujades 1, Barcelona.

- Course type: Short course.
- Academic recognition: 2 ECTS-point (including pre-course reading)
- Participant prerequisites: Proficiency with LCA or having taken the course 'Fundamentals of Life Cycle Impact Assessment'. Must bring own laptop computer.
- Format: 6 hours lectures. 18 hours workshops/exercises.
- Minimum and Maximum number of participants: 4-12.
- Status: Proposed
- Price: 3000 Euro for professionals / 1200 Euro for university personnel / 600 Euro for students. Half price for the second person from the same institution. Does not include travel, accommodation and meals. Please ask for our list of accommodation recommendations.
- Registration deadline: 15 December 2017
- Contact person and email: Inger Weidema; Inger@ilca.es