REGIONALISED LIFE CYCLE ASSESSMENT WITH THE BRIGHTWAY2 SOFTWARE

An introduction to the use of the Brightway2 Open Source LCA software with a particular focus on applying it to regionalised assessments. The matrix foundations of LCA and its use for uncertainty analysis. Creating and using regionalized activity datasets and regionalised impact assessment methods in Brightway2, with applications to a case study.

The course

COURSE OUTLINE
- *Day 1, morning: Brightway structure and first LCAs*
- Introduction to the mental and computational model behind Brightway from the ground up. First applications of database creation, modification of datasets, and LCA calculations.

- *Day 1, afternoon: Uncertainty, sensitivity, and dynamic LCA*
- The matrix foundations of LCA, and how this is implemented in Brightway. How to apply matrix fundamentals for uncertainty analysis through Monte Carlo uncertainty assessment, including going beyond sampling from independent probability distributions. Using sensitivity analysis to find the key drivers of uncertainty. Dynamic LCA (LCA resolved in time) requires a completely different approach - graph traversal instead of matrix math.

- *Day 2, morning: Theory and methods for regionalization*
- How to regionalize inventory datasets. How to build and use regionalized impact assessment methods. Regionalization needs different matrices than site-generic LCA, and there are multiple options available for matrix-based methods. Review of matching spatial scales using raster and vector weighted averages.

- *Day 2, afternoon: Regionalized calculations*
- Application of regionalized methods to case studies. Combining regionalization with uncertainty assessment and dynamic LCA.

FORM AND ACADEMIC RECOGNITION
Form: 4 hours lectures, 12 hours exercises.

Academic recognition: 1 ECTS-point including mandatory pre-course reading from a literature list provided, installation of software (instructions will be provided), and small pre-course exercises.

ILCA
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- Knowing the different components of Brightway, and their application in LCA calculations.
- Ability to manage data in Brightway, including data import and modification.
- Understanding the way that LCA data is stored and used in Brightway, and how the data schema of Brightway is translated into matrices for LCA calculations
- Ability to apply and interpret basic LCA calculations in Brightway
- Being able to describe and appraise how Monte Carlo sampling is implemented in Brightway
- Reproduce sensitivity analysis calculations using Brightway
- Understand how graph traversal is applied for dynamic LCA
- Ability to explain the differences between different regionalization calculation methods
- Ability to plan data collection for regionalized LCA studies
- Ability to analyse the data flow from core Brightway concepts to regionalized LCA matrix construction
- Ability to calculate regionalized LCA scores of a case study
- Ability to interpret the calculated scores
- Ability to apply uncertainty and dynamic LCA analysis to a case study

The practicalities

WHEN AND WHERE?
Thursday, October 31th to Friday, November 1st, 2019
Spain, Barcelona, International Life Cycle Academy (ESCI-UPF), Passeig Pujades 1 (entry from Passeig Picasso 8)

PARTICIPANT PREREQUISITES
Master degree or equivalent. A basic understanding of life cycle assessment. Must bring own laptop computer, with Brightway2 installed.

TEACHING STAFF
Dr. Christopher Mutel, Paul Scherrer Institute (PSI), Creator of Brightway

PRICE AND COURSE CONDITIONS
2400 Euro for professionals
1200 Euro for university personnel and
600 Euro for students.

Second registrations from the same institution or participants in the LCIA course in week 45 of 2019 are offered a 50% discount on this course.
Prices do not include travel, accommodation and meals.
Accommodation recommendations will be sent once course is confirmed.

CONTACT PERSON:
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