

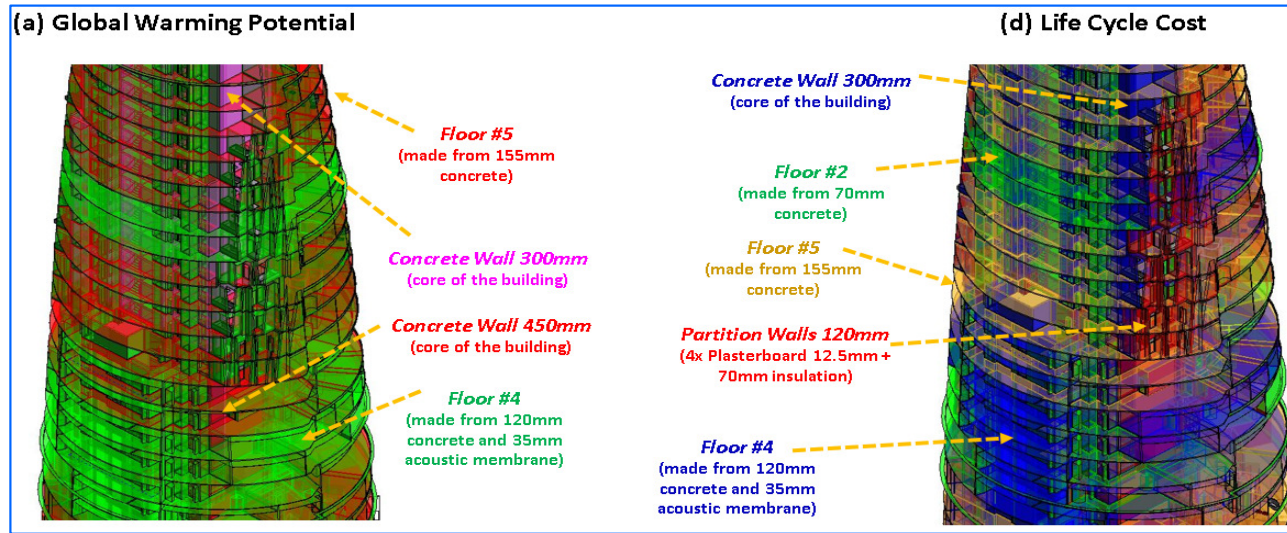
5° ENCONTRO ObservIST - Higher Education area

Pilot courses on ‘Life Cycle Assessment of Construction’

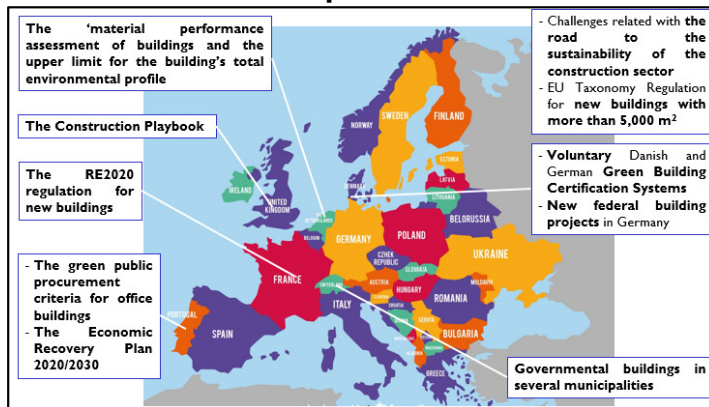
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I. Implementation of a Life Cycle Thinking in the construction sector:

a) Research background;



b) Environmental and economic **Life Cycle Assessment (LCA)** are **recognized and standardized** procedures to evaluate the sustainability of the construction sector;



c) The application of a detailed LCA approach to buildings or other construction works is a **multidisciplinary, onerous and lengthy task**.

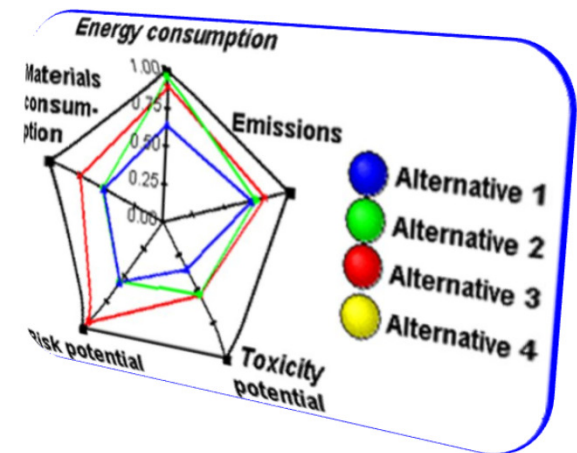


Learning objectives

- **Theoretical** and **practical** basis for the **LCA of construction** based on European and International **standards** and **regulatory principles**;
- To use **LCA databases** and software tools and comprising the **environmental**, **economic**, and **social** dimensions of the sustainability for standardised **life cycle stages**;
- To perform LCA at the construction materials' **production, design, construction, maintenance, rehabilitation, service life and end-of-life management**;
- To use LCA in the **evaluation and certification of construction products**;



- To apply methodologies to **optimize costs, minimize environmental impacts** and have an **integrated approach**.




Language of instruction: English.

- Suitable for students from the following MSc, and related PhD programmes: **Architecture**; **Civil Engineering**, **Environmental**, **Materials**, and **Mechanical Engineering**; **Energy Engineering** and **Management**; **Spatial Planning** and **Urbanism**.



- **2016, 2018 and 2020 (online): 30 students in 3 pilot-courses of 20 hours each;**

CURSO-PILOTO DE "AVALIAÇÃO DO CICLO DE VIDA DA CONSTRUÇÃO"
DECivil, IST, Lisboa, setembro a outubro de 2020



Curso-piloto de "Avaliação do Ciclo de Vida da Construção"
 (preparação de curso Fundec e de Unidades Curriculares do Mestrado e do Programa Doutoral em Engenharia Civil)

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Lisboa – Setembro de 2020 11/11

Apresentação dos formandos (2/2)

Keila Robalo

Marina Machado

Md Abu Toyob Shahid


Pedro Pedroso

Selma Fakri

*Formação de base e trabalho de investigação em curso?
 Background ACV na construção? Expetativas para o curso?
 Utilização futura do conhecimento/ competência?*


- **Continuous improvement and fine-tuning** of the course contents, organisation, and grading system, with active participation and recommendations **by the students via final surveys**;
- **Dedicated software** bought by CERIS after recognising the importance and emergence of this research area;
- **Project-based learning** approach.

- **2016, 2018 and 2020: 30 students in**
- **3 pilot-courses of 20 hours each;**



Curso-piloto de “Avaliação do Ciclo de Vida da Construção”

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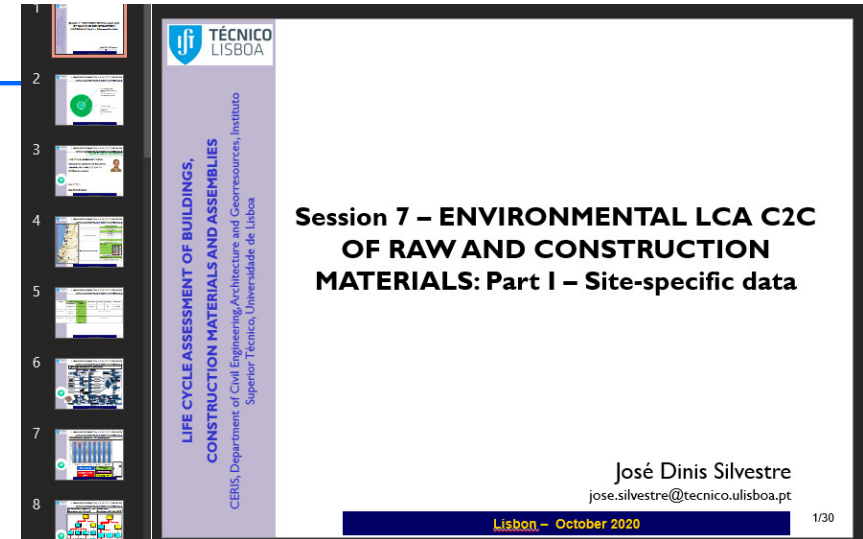
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Formação de base e trabalho de investigação em curso?
Background ACV na construção? Expetativas para o curso?
Utilização futura do conhecimento/ competência?

- **2nd semester of 2020/21:** module of **6 hours** dedicated to ‘Life Cycle Assessment of Buildings, Construction Materials and Assemblies’ in the ‘**Advanced Topics in Construction**’ course of the **Doctoral Program in Civil Engineering**;
- **From 2021/22:** new course ‘**Construction Life Cycle**’ in the **Master of Science (MSc) in Civil Engineering**, with a module of **14 hours** dedicated to ‘LCA of Construction’, that attracted **61% of Erasmus students**;
- **May 2022:** two lectures with a total of **4 hours**, Master's degree in “Sustainable City and Architecture”, at Universidad de Sevilla, Spain.

Course materials:

- Supporting presentations in English: for 12 classes, with a total of 379 slides;
- **Reference tables and schemes** on important topics;
- Schemes and detailed instructions to support the development of **group assignments**;
- Silvestre, J.D. (2021): ***‘Life Cycle Assessment of Construction in support of innovation’*** - Advanced Topics in Construction course, 67 p.



3E-C2C module - assembly performance:	Product stage (A1-A3)	Transport to the building site (A4)	Installation in the building (A5)	Use stage		End-of-life stage - transport, processing and disposal (C4-C6), and reuse, recovery and/or recycling potential (D)
				Maintenance, repair and replacement (B2-B4)	Energy use for heating and cooling (B6)	
Environmental	LCA		-	LCA		
Economic	Initial cost			Costs	-	Costs
Energy	-			Costs		-

Life cycle stages of construction according with European standards - from:

A1-A3	A4 – C (including use and end-of-life)	D (including reuse and recycling)
Cradle to gate (A1-A3)	Gate to grave (A4-C)	
Cradle to grave (A-C)		
Cradle to cradle (A-D)		

4. Future teaching of the contents of these courses

- **Professional training course** via FUNDEC/Técnico+ at DECivil;

- **National or international Universities;**



- **Massive Open Online Course (MOOC);**

Introduction to Life Cycle Assessment
massive open online course (MOOC)
launches to the public, a collaborative
effort between Polytechnique Montreal
and EPFL

The CIRAI is officially launching its first online course (MOOC) for the general public on its core expertise: life cycle assessment (LCA). This is a comprehensive online course, the first in the world in French, aimed at teaching LCA methodology.

- **Summer School.**

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Thank you to all students and invited trainers.

Thank you for your attention.

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