

ECCS Academy's webinar sessions on
« Life-cycle driven design of steel structures »
18, 19, 25 and 26 November 2026

By Alper Kanyilmaz

Alper Kanyilmaz is [Associate Professor](#) in the Department of Architecture, Built Environment and Construction Engineering at [Politecnico di Milano](#). He works at the intersection of mechanics, data science, and digital technologies to advance a safe and resilient built environment, investigating how structures perform and deteriorate over their life cycle and how their dynamic response can be monitored and interpreted. He serves as Expert Advisor to the [European Commission Steel Advisory Group](#) for the 2025 to 2029 mandate and as project monitoring expert for the European Commission in the area of future low emission industries. Some of his highly cited works include "[How does conceptual design impact the cost and carbon footprint of structures?](#)", "[Reuse of Steel in the Construction Industry: Challenges and Opportunities](#)" and "[A genetic algorithm tool for conceptual structural design with cost and embodied carbon optimization](#)". He teaches structural mechanics and life cycle driven structural design to more than two hundred students each year and collaborates with industry and public institutions on digital construction and disaster prevention strategies.



The training will also feature four guest case studies:

- **Ricardo Pimentel (Divisional Director, Pell Frischmann)** on life cycle driven design optioneering;
- **Roy Fishwick (Managing Director, Cleveland Steel & Tubes)** on steel reuse;
- **José Oliveira Pedro (IST Lisbon, GRID Consulting Engineers)** on high-strength steel bridges;
- and **Ahmet Topbaş (Founder, ATTEC)** on steel-timber hybrid structures.

OBJECTIVE

This training provides a practice-oriented framework for calculating and reducing embodied carbon in steel structures, with a focus on early-stage decision making, high strength steel applications, reuse strategies, and data-driven optioneering. Through guided exercises, real project case studies (including different type of buildings), and interactive discussions, participants will develop skills directly applicable to daily design practice. By the end of the webinar, participants will be able to perform embodied carbon calculations, understand techniques and strategies for reducing embodied carbon emissions, conduct comparative analyses between structural options, integrate EPD based material selection into procurement decisions, and learn how to use data driven tools to design lighter, more durable, and life cycle oriented steel structures.

Life-cycle driven design of steel structures for reduced embodied carbon

Webinar PROGRAMME

<u>Date</u>	<u>Title</u>	<u>Content</u>
Session 1 18/11/2026 16:00-18:00	Introduction: life-cycle thinking for steel and composite structures	- Welcome, introduction, contents, learning outcomes - Climate targets and implications for the steel community during the climate crisis - Definition of life-cycle stages of a steel structure: • Product stage "raw materials" (A1) • Product stage "transport" (A2) and "manufacturing" (A3), construction stage "transport" (A4) and "installation" (A5) - Where the embodied carbon sits in a steel building: frame, floors and foundations, and the role of composite floor systems - Industry case study "Life cycle driven design optioneering", by Ricardo Pimentel (Divisional Director, Pell Frischmann) - Q & A
Session 2 19/11/2026 16:00-18:00	Carbon accounting, end-of-life and steel reuse	- How to calculate the embodied carbon of a steel structure? - Introduction to EPDs and variability in carbon data - End-of-life stages (C1, C2, C3, C4) - Design for deconstruction and steel reuse as a structural strategy - Industry case study "Steel reuse in practice" by Roy Fishwick (Managing Director, Cleveland Steel & Tubes) - Q & A
Session 3 25/11/2026 16:00-18:00	Design strategies and options: buildings, industrial structures and bridges	- How to reduce the embodied carbon by means of structural design? - Sensitivity studies comparing the embodied carbon impact of steel buildings in terms of: span length, number of stories, slab types, lateral resistant systems, material type, different databases and EPDs. - Industry case study "High-strength steel for bridges", by José Oliveira Pedro (IST Lisbon, GRID Consulting Engineers) - Q & A
Session 4 26/11/2026 16:00-18:00	Hybrid solutions	- Combining steel with other materials: hybrid structural systems (e.g. steel-timber) - Balancing cost and performance requirements - Industry case study: steel-timber hybrid structures, by Ahmet Topbaş (Founder, ATTEC) - Q & A and closing remarks

Session 5: 20 January 2027

Designing Steel Structures for Seismic Resilience and Reparability

This session will present a practice-oriented course on seismic resilience and reparability of steel structures, drawing on RS4, a recent Italian national research project. Topics will include Eurocode 8-based building case studies, development of fragility curves, experimental testing of innovative self-centering devices, and life-cycle assessments highlighting environmental and economic benefits.

Lecturers are

- Massimo Latour (University of Salerno, Italy)
- Mario D'Aniello (University of Naples Federico II, Italy)
- Alper Kanyilmaz (Politecnico di Milano, Italy)
- Alessandro Menghini (Politecnico di Milano, Italy)
- and Annarosa Lettieri (Nagoya Institute of Technology, Japan)

Session 5	Topics	Contents
15:00–18:00 (3 hours)	Seismic resilience, reparability and sustainability of steel structures	- Introduction to the RS4 project and its objectives - Experimental investigation and FEM of innovative dissipative devices for resilient and repairable steel structures - Design and nonlinear seismic simulations, Incremental Dynamic Analysis (IDA) and fragility curves - Life Cycle Assessment (LCA) and Life Cycle Costing (LCC): comparison between innovative and conventional EBF systems - Discussion and Q&A (30 min)

For more information and registration, visit www.steelconstruct.com.