

## END OF LIFE, CIRCULARITY AND LIFE CYCLE ASSESSMENT OF STRUCTURAL MEMBRANES

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### ABSTRACT

We invite researchers, professionals, and industry leaders to participate in an engaging session focusing on the **environmental efficiency of membrane architectures** and their sustainable development. Key aspects, such as the organic shapes, lightweight design, high flexibility, translucency, fast installation, and low maintenance of membrane materials, make them pivotal in modern architecture but also demand a comprehensive evaluation of their environmental footprint.

The session will explore the **end-of-life scenarios** of membrane structures, emphasizing the differences between permanent and temporary applications, and their impact on material circularity: case studies and ongoing practices are welcome. Strategies to improve **sustainability at every life cycle stage**—from material selection to disposal—will be discussed, with a particular focus on integrating Life Cycle Assessment (LCA) methodologies. Comparative LCAs will be highlighted as tools to quantify and evaluate environmental impacts across the **life cycle of matter, building components, and complete membrane structures**, providing actionable insights for eco-efficient design decisions.

The session will also address the processes and opportunities in **economic circularity**, including enhancing the eco-efficiency of existing materials, developing new sustainable options (e.g., bio-based or recycled materials), and embracing practices aligned with **the 6Rs of sustainability**: Rethink, Refuse, Reduce, Reuse, Recycle, and Repair.

Participants will discuss advancements towards **nearly zero-energy consumption, and nearly zero-zero waste** goals in membrane architecture, offering innovative solutions to reduce the environmental impact of these systems while promoting circularity and resilience in the built environment.