FACADES-AS-A-SERVICE
A strategic investment model for the (re)development of circular façades

Keywords: Circular Economy, integrated facades, Product-Service Systems, energy transition, lifecycle management, performance contracting

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Area of Research: Design Engineering | Innovation in Management of the Built Environment

Research Summary:
The rate at which the building stock is improving, in terms of resource efficiency and greenhouse gas emissions, is far below what is needed to meet even the most conservative climate change and environmental impact mitigation goals. The strategic investment of limited resources – energetic, material, and financial – which dictates the development of the built environment, is largely driven by individual decision-makers with specialized fields of knowledge, specific interests, and acting within diverse timescales.

Improving the resource-efficiency of the built environment, in terms of the quality of new constructions and the rate and depth of technical building retrofits, is no longer a question of technology, but rather of managerial processes, economic incentives, and business development. Emerging theoretical frameworks, such as the Circular Economy and Product-Service Systems, aim to operationalise the total societal value of better individual decision-making processes, as well as of long-term, collaborative project execution mechanisms. In line with these frameworks, the research aims to elaborate a strategic investment model supporting the service-based (re)development of circular facades.

Research Methodology:
The model balances Total Cost of Ownership against Total Value of Ownership for diverse technical building envelope alternatives, with regard to the three resource categories formerly mentioned. It then defines a practical implementation plan according to the capabilities and priorities of different investor profiles. The model is then evaluated to determine its rate of success at addressing the resource management and environmental impact challenges previously identified. Lastly, recommendations are made regarding the validity, upscalability, and future development of the proposed methodology.

Key Publications: