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DOCTOR OF ENGINEERING SCIENCES

of **Ruben Van Vooren**

The public defense will take place on **Tuesday 23rd June 2026 at 5:30pm** in room **D.2.01** (Building D, VUB Main Campus)

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THE AFTERLIFE OF FAÇADES. ACTIONS AND ROLES TO ENABLE THE REUSE OF FAÇADE COMPONENTS IN LARGE SCALE RENOVATION PROJECTS

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Abstract of the PhD research

Today, several drivers are pushing building owners to make changes to their façades. In conventional façade renovation or demolition projects, this typically leads to renewal of the existing façade components, such as window frames, glazing, stone cladding, or bricks. In this process, the embodied technical, environmental, financial, and cultural value of these components is lost through incineration, downcycling or at best, recycling. While alternatives exist for increased value retention - direct reuse, refurbishing, remanufacturing, and repurposing of façade components, collectively referred to as reuse - today, these are only observed in a few pioneering projects. When aiming to reuse façade components, practitioners encounter a range of challenges, including technical, financial and organisational uncertainties.

This research investigates how architects and façade specialists can enable the reuse of façade components in large-scale renovation projects, by identifying actions and roles. Drawing on in-depth case studies (12 projects and 4 scouting practices), 80 interviews and 8 workshops, the research positions itself close to pioneering practices involving reuse and façades. Part I identifies a set of reuse-enabling actions and guiding principles - mindsets - at the project level. It then zooms in on material scouting (i.e., the process of connecting offer and demand), showing how digital platforms can support sourcing and salvaging actions. Finally, it explores decisionmaking on reuse options (i.e., which components to reuse through which operations), discussing relevant criteria and highlighting façade mock-ups as experimental cocreation processes. Yet, while these project-level strategies proved effective in pioneering cases, they may be insufficient for widespread reuse, especially for complex, multi-component façade products. Therefore, Part II explores reuse of aluminium at the sector level. It describes emerging roles and proposes reuse network models that can support a resilient, circular 'ecosystem'.