

Supporting Public Decision-Making in Energy-Efficient Heritage Preservation within the Framework of Renewable Energy Communities

Giorgia Malavasi ⁽¹⁾

⁽¹⁾ Politecnico Di Torino, Architecture And Design (dad), Torino, Italy

Keywords: Life Cycle Costing (LCC), Heritage Energy Empowerment, Renewable Energy Communities, Public projects

Abstract Effective financial and economic analyses are crucial for guiding public-sector strategies in the energy transition, particularly in contexts involving architectural and landscape heritage and different stakeholders.

This research proposes a methodological approach developed to support Public Administrations in decision-making processes to identify and evaluate energy empowerment strategies within the framework of Renewable Energy Communities (RECs). The approach is applied to the case of the future public spaces of the Former Ammunition Depot in Sangano (Piedmont, Italy), a historical abandoned site now targeted for redevelopment within the local REC improvement.

The economic evaluation of heritage energy empowerment is based on Life Cycle Costing (LCC) as a decision-support tool to compare alternative intervention scenarios in a life cycle perspective, accounting for long-term operational, maintenance, and end-of-life implications of energy retrofitting solutions. The decision-making process is based on a structured involvement of Public Administrations, actively engaged in all evaluation phases to ensure institutional feasibility and shared outcomes.

LCC emerges not only as a cost assessment tool but as a core component of the decision-making workflow, enabling the identification of economically sustainable strategies aligned with energy transition objectives, budgetary constraints, and heritage conservation priorities. The results demonstrate the value of a replicable and adaptable evaluation framework to support small and mid-sized municipalities in planning resilient, inclusive, and financially grounded transition pathways.