ICSET 2025 International Congress on Sustainable Energy and related Technologies
Lipari (Italy), June 22-26, 2025

NON-RESIDENTIAL URBAN DISTRICTS IN THE MEDITERRANEAN AREA: ENERGY MODELLING, SIMULATION AND RENOVATION ASSESSMENT IN A POSITIVE ENERGY DISTRICT PERSPECTIVE

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Positive Energy Districts (PEDs), along with their distinctive properties and key-performing features, currently play a strategic role in the path towards energy transition. They recently disclosed several challenging opportunities for the far-sighted assessment and conscious energy renovation of existing urban areas, either residential or non-residential. Nevertheless, in particular when dealing with a heterogenous built environment and with a multifaceted built heritage, it could be hard and particularly tricky to define effective renovation solutions able to optimize its overall energy performances. Such a challenging goal also depends on the specific context in terms of climate, buildings' type and intended use. In the light of the above-mentioned observations, the aim of the present study is to find out and define a fruitful energy renovation criterion – PED oriented – to deal with an urban case study of the Mediterranean area, therefore addressing decarbonization policies according to a strategic methodology. This paper presents the key-results of an Italian PNNR (National Recovery and Resilience Plan) Project named GRINS (Growing Resilient, INclusive and Sustainable): it focuses, in the first instance, on the definition and modelling process of different building archetypes, then moving on to the assessment of multiple energy renovation options. Specifically, this study explores the key-findings of a targeted research aimed at the definition, the characterization and the energy assessment for a selected urban district – representative for a typical southern Italy scenario - with a focus on its overall performances (ex-ante and ex-post renovation). Key findings include both the validation of the modelled district (that shows an average deviation ranging between 6% up to around 9% between the energy models' annual demand and the energy bills registered for the analysed buildings), and an assessment of district's renovation potentialities. The overall analysis reveals that post-renovation configurations for on-site energy generation could provide up to 80% of the district's annual energy demand. Such findings therefore provide valuable results, also disclosing useful insights and reference examples to foster and support the energy transition, serving as a catalyst for current - and future - discussions and initiatives within urban transition policies.

Acknowledgements

This study was funded by the European Union - NextGenerationEU, Mission 4, Component 2, in the framework of the GRINS -Growing Resilient, INclusive and Sustainable project (GRINS PE00000018 – CUP B73C22001260006). The views and opinions expressed are solely those of the authors and do not necessarily reflect those of the European Union, nor can the European Union be held responsible for them.