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Optimization of SMR cogeneration application in an urban environment

In our work, we set as a primary goal to determine what expectations can be formulated for a newly installed SMR (Small Modular Reactor) in terms of district heating supply and integrated electricity production in an urban environment. Alongside optimal sizing, the level of flexibility and cogeneration capability required for integration into the urban energy system was examined. When establishing the potential role, a fundamental question naturally arises regarding how competitive nuclear energy is compared to the most important alternatives currently used, such as waste, biomass, fossil fuel-based, or electrically powered heat pumps. In formulating optimal solutions, economic considerations were taken into account along with climate impact and environmental effects. Our work was based on Budapest's building typology, district heating system, and a fine resolution dataset of its energy demand, implementing our optimization calculations as a type of fixed cost distribution problem. The results presented could provide guidance in designing cogeneration applications for SMRs.

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Confirm that the work is original and has not been published anywhere else

YES

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