

# ICES 2024

**TITLE OF PROJECT: Feasibility Study of Electricity Generation from grey water in High-Rise Buildings Using Different Types of Turbines**

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## **ABSTRACT:**

The use of energy harvesting caters to sustainable alternatives, to limit the dependency on non-renewable resources. Energy harvesting from high-rise buildings using sustainable means is gaining attention in recent research. Particularly considering, high-rise buildings in high-density urban environments, where energy modelling has been a case of extreme caution for the depleting water resources. Therefore, significance into rationalizing solutions for the problem created, should be of immediate concern and need. The paper incorporates, the feasibility of using different types of turbines to generate electricity from high raised buildings. By evaluating various turbine designs, the research aims to optimize energy output while efficiently utilizing greywater resources. An experimental study is carried out to simulate the scenario of a high-rise building and the best suited turbine is finalized by energy output measurement and its commercial advantage based on the Indian scenario. A scaled down 3-d printed model is fabricated into mechanism constructed to generate electricity. The method of dimensional analysis is used to relate to the scaled-up assembly of the turbines to hence correlate the results obtained. An additional design optimization of the turbines is also conducted suite the needs of the simulation set-up. This research ensures that the chosen turbine is not only technically feasible but also economically viable, henceforth providing a comprehensive solution to the challenges of energy sustainability and water resource conservation in high-density urban environments.

**KEYWORDS:** Energy harvesting, Turbine, energy output measurement, water resource conservation, high-density urban environments, design optimization, commercial advantage, 3-d printed model, dimensional analysis.

**CATEGORY:** Hydraulic and Water Resources Engineering