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Sobol Sensitivity Analysis

Zeferina et al. [1] investigate the sensitivity of cooling demand in large office buildings by using a building performance simulation model for a large office building in different climates. The model and sensitivity analysis will help understand what variables effect building energy consumption. The sobol indices indicate that ventilation rate (P10) contributes the largest for HVAC end-use electricity demand for both annual and peak demands. For total demand, lighting (P5) and equipment (P6) become key contributors, accounting for up to 90% of the changes in total annual electricity demand. However, the effect of these parameters on the model varied, sometimes greatly, with the climate of regions in the model. This is variability of sensitivity based on climate will be critical to making efficient building standards for specific regions rather than a one size fits all approach.

1. Zeferina, V., Wood, F. R., Edwards, R., & Tian, W. (2021). Sensitivity analysis of cooling demand applied to a large office building. *Energy and Buildings*, *235*, 110703. <https://doi.org/10.1016/j.enbuild.2020.110703>