# Geographic Information System for District Level Energy Performance Simulations

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**Abstract :** The utilization of semantic, cadastral and topological data from geographic information systems (GIS) has exponentially increased for building and urban-scale energy performance simulations. Urban planners, simulation scientists, and researchers use virtual 3D city models for energy analysis, algorithms and simulation tools. For dynamic energy simulations at city and district level, this paper provides an overview of the available GIS data models and their levels of detail. Adhering to different norms and standards, these models also intend to describe building and construction industry data. For further investigations, CityGML data models are considered for simulations. Though geographical information modelling has considerably many different implementations, extensions of virtual city data can also be made for domain specific applications. Highlighting the use of the extended CityGML models for energy researches, a brief introduction to the Energy Application Domain Extension (ADE) along with its significance is made. Consequently, addressing specific input simulation data, a workflow using Modelica underlining the usage of GIS information and the quantification of its significance over annual heating energy demand is presented in this paper.

**Keywords :** CityGML, EnergyADE, energy performance simulation, GIS

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