# Time-Dependent Simulation of a Large Passively Heated Building

- Analyzed the thermal performance of a large office building in Romania during the cold season against European standards

- A passive system was implemented that made use of light through windows and ground heat exchanger

- Made use of temperature and solar data in a transient analysis

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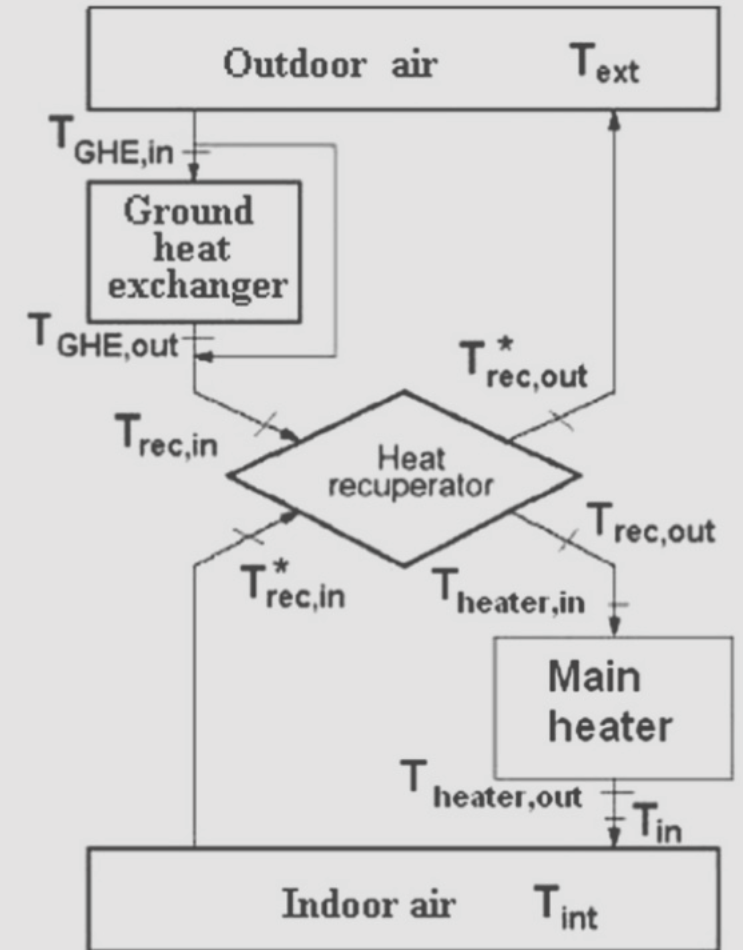
Important Takeaways

- Simulation/analysis similar to techniques learned in class

- Yearly thermal load of 6.7 kWh/m^2, better than standard of 15 kWh/m^2

- Ground heat exchanger provided the most heat to the building, η_{GHE} = 16.9%

- Transient analysis demonstrated that the system is sufficient to meet demands
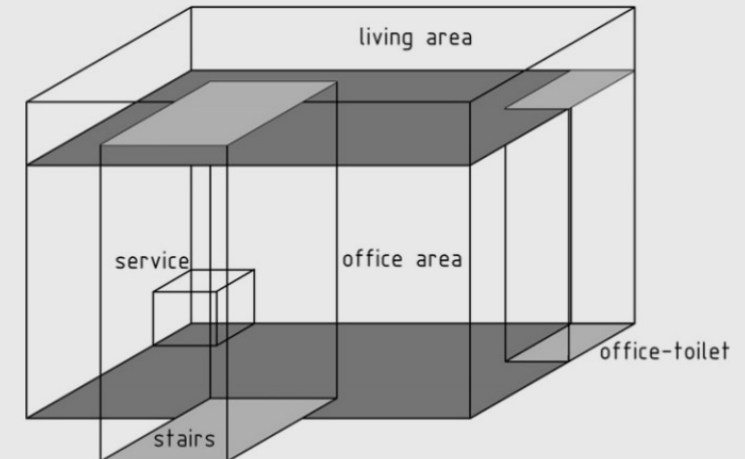
Ideas for Future Development

- Extend analysis to hot season to determine cooling requirements

- Factor in impact of wind or other weather conditions on building

- Determine if existing heating/cooling capabilities support growth in heat load (computers) or use of more efficient lighting and other heat sources

Works Cited:

1. Badescu, V., Laaser, N., Crutescu, R., Crutescu, M., Dobrovicescu, A., & Tsatsaronis, G. (2011). Modeling , validation and time-dependent simulation of the first large passive building in Romania. *Renewable Energy*, *36*(1), 142–157. https://doi.org/10.1016/j.renene.2010.06.015