# Title: Stockholm Building Heat Atlas

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**Specialty destination:** filière Energie

**Short background:**
In Sweden, building heating demand accounts for more than 55% of final energy use [1]. It is interesting to see how the building heating demands distribute among the Stockholm city, so that better energy planning can be achieved at district or commune level. Existing projects such as the Pan-European Thermal Atlas has mapped building space heating density for 14 European countries [2]. But the mapping is insufficient to support energy decision making, since it is calculated on population density, not on real individual building.

To improve the building heat mapping, high resolution vector maps are intended to be used in this project. Building energy consumption can be simulated using IDA-ICE. Combined with meteorological data, roof-top PV potential can also be evaluated. Finally, visualized through geographical information system (GIS), a Stockholm Building Heat Atlas can be generated.



Figure 1. 3D building map of KTH campus, no energy data assigned yet

**Description of the task and methods**:
- Literature review on publications related to the topic.
- Collect extensive building data from e.g. OpenStreetMaps.
- Building energy consumption simulation using tools such as IDA-ICE
- Using GIS spatial analysis modules or develop new algorithms to identify building heat clusters.
- (Evaluate rooftop PV potentials)
- Visualize the results and generate the Stockholm Building Heat Atlas.

**Prerequisites:**
- Understanding of building energy simulation using related tools such as IDA-ICE, TRNSYS, EnergyPlus, etc.
- Have experiences in GIS or have motivations in learning open-source GIS software, preferably QGIS.
- Experiences in Python will be an asset.
- Interest to come to Stockholm in summer 2021
- Regular guidance appointments in LIED (Paris 13e arrondissement)

**References:**
[1] Swedish Energy Agency, "Energy in Sweden 2019 an overview," 2019.
[2] Pan-European Heat Atlas, https://heatroadmap.eu/peta4/