Research Database on Non-residential Buildings
(ENOB:dataNWG)

Forschungsprojekt im Förderbereich
Energieoptimierte Gebäude und Quartiere im
6. Energieforschungsprogramm der Bundesregierung
Förderkennzeichen 03ET1315

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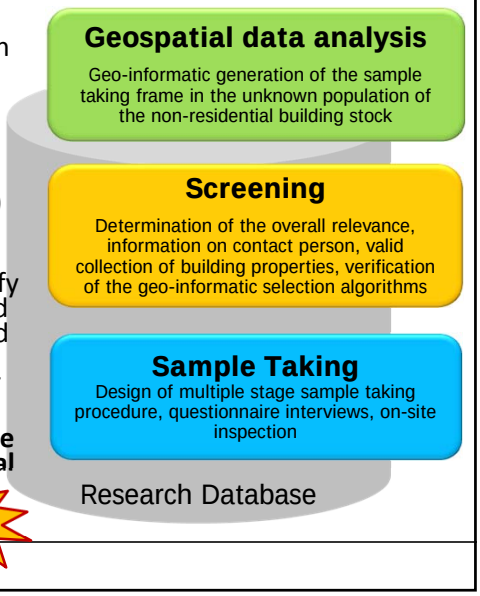
IBPSA Project 1, Kick Off
Berlin, 27.02.2018

Sponsor VSA 2.0

Gefördert durch:
Bundesministerium für Wirtschaft und Energie
aufgrund eines Beschlusses des Deutschen Bundestages

Research Approach

- **Research object (RO) is the German non-residential building stock**, which shall be investigated through representative sample taking.
- Due to the recent development in geo-informatics the frame for the **sample taking** can be generated **on the basis of geo-referenced (partial) building perimeters** as survey units (SU)
- **Screening** of the buildings will identify the **relevance** of the survey units and the **relationship** between the RO and the SU. Furthermore contact information of the building owner or user will be collected.
- **This approach enables to explore the sector of the German non-residential buildings in a statistically significant and cost efficient way.**



Representative Sample

- Representative, i.e. unbiased, conclusions from a sample of non-residential buildings to the corresponding population, the whole stock, require:
  - Pure chance decides on the inclusion of a building into the sample.
  - Every building has a chance, i.e. a positive probability, to be included in the sample.
  - The probability of all buildings in the sample is known.
- Arbitrary collections of buildings and its data do not suffice these requirements.

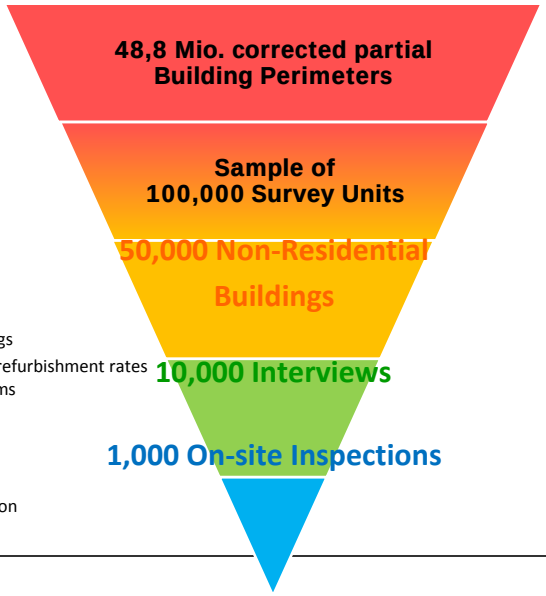
Methodology

Phase 0: **Geo-Spatial Analysis**
- Geo-Coordinates and sample-taking frame
- Building function
- Building geometry
- Sample taking

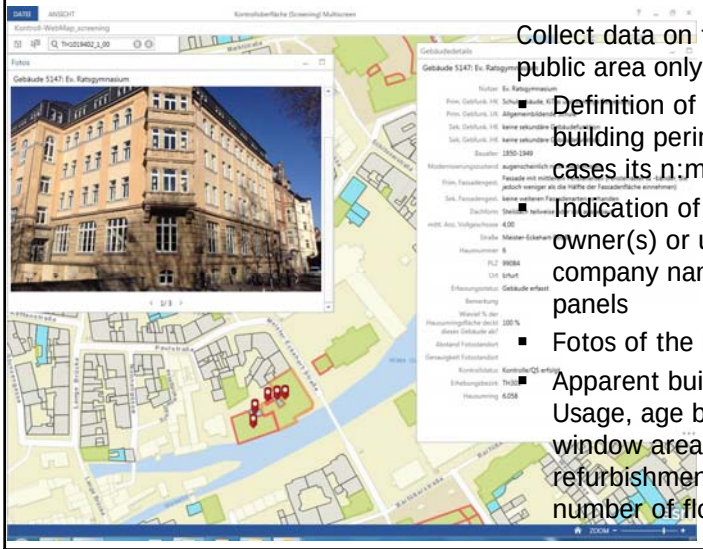
Phase 1: **Screening**
- Relevance of buildings
- Building properties
- Building surroundings
- Building owner or user

Phase 2: **Sampling Interviews**
- Structural properties of buildings
- Energy-related properties and refurbishment rates of building envelope and systems
- Ownership
- Management behaviour

Phase 3: **On-site Inspections**
- Energy demand and consumption
- User parameters



Screening



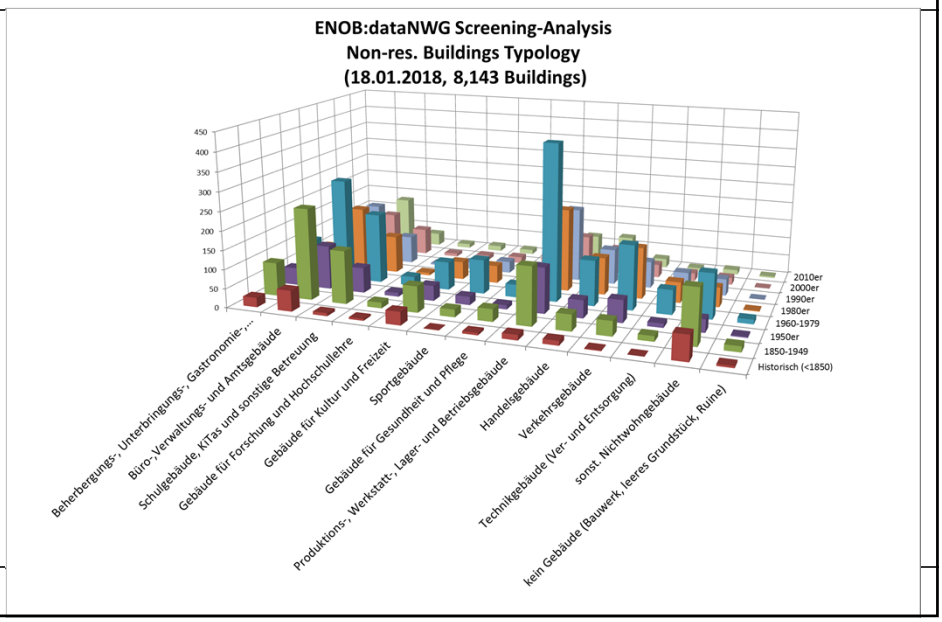
Collect data on the building from public area only:

- Definition of the building from building perimeters: In many cases its n:m-relations!
- Indication of the presumable owner(s) or user(s) from company nameplates or doorbell panels
- Fotos of the building
- Apparent building features: Usage, age band, percentage of window area, state of refurbishment, roof type, number of floors

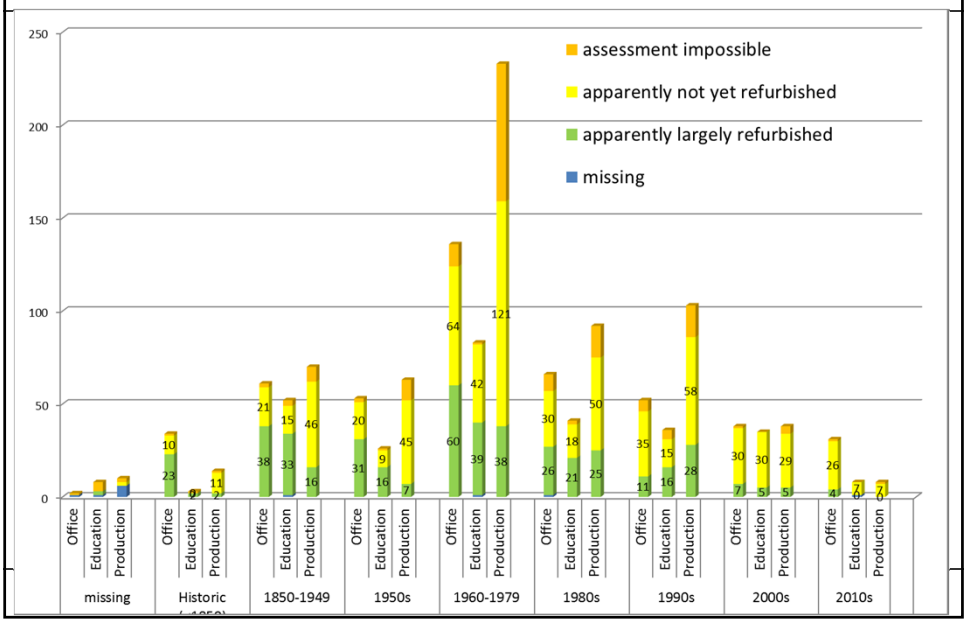
Geo-spatial Data Analysis

- Based on LoD1 data
- Whole building perimeter and area of building envelope towards the main compass directions
- Area of building footprint
- Mean building height
- Gross building volume

Typology



State of Refurbishment



Sample Survey

Interview

- Structural Data: Building use, age, area, owner, ...
- Envelope: Construction type, subsequent insulation, window type, annual rates of refurbishment
- Technical Installations: Heating, DHW, ventilation, cooling lighting, annual rates of refurbishment

On-site Inspection

- Measured consumption of delivered energy for heating / dhw and electrical energy
- User Parameters: Room temperature, utilization time, internal heat gain from equipment
- Input variables for a simplified demand calculation