"Acquisition of local and regional data for inventories and potentials - methods and best practice examples"

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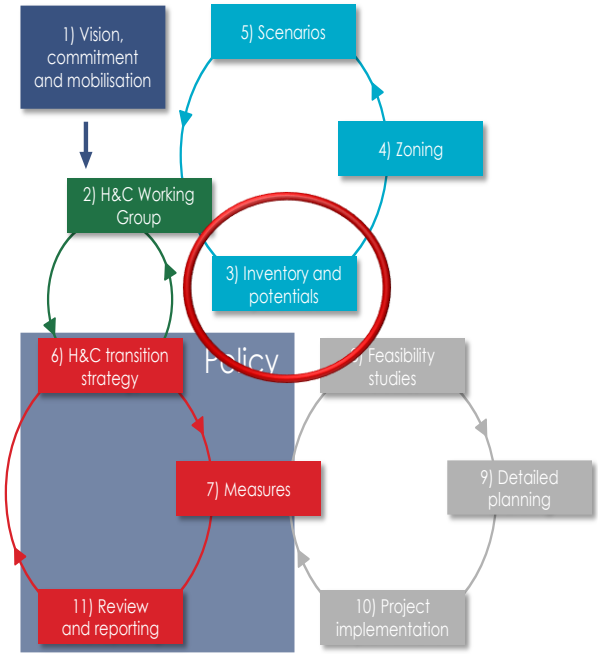
Overview

- Inventory Analysis
  - Identifying municipality structures and approaches for data acquisition
  - Energy and GHG Balance
  - Spatial representation of the identified data
- Potential Analysis
  - Potential Heat Supply Sources
  - Methods for identifying spatial distribution of supply sources
- Tools
  - Energy and GHG balance sheets
  - Data Management and structuring



Source: Strategic H&C planning success factors, D2.1 of the Act!onHeat project, 2022

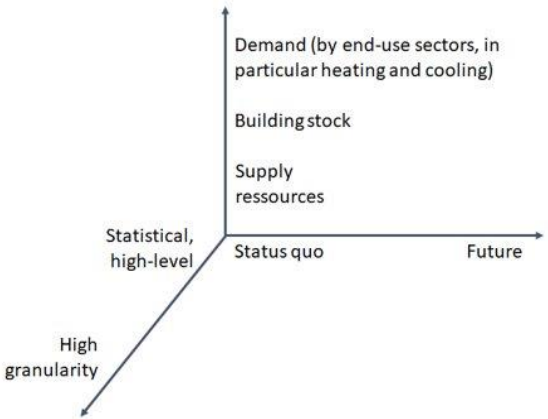
Inventory Analysis

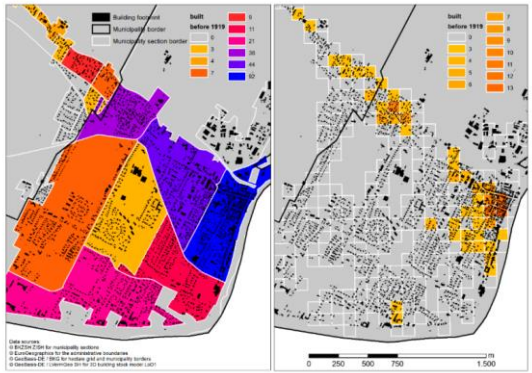
Approaches for inventory generation

- Bottom-up
- Top-down

Municipality Structures

- Geographically isolated sub localities
- Small individual municipalities
- Municipality alliance





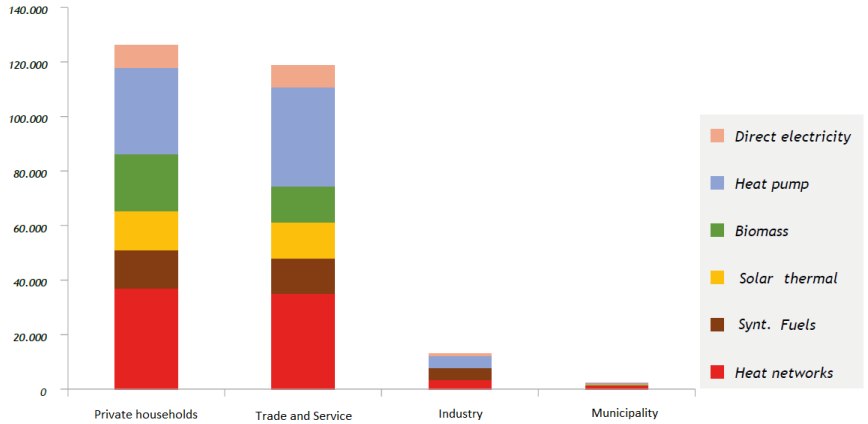
Source: Schwanebeck,2021

Required Data	Local-level Potential Sources	Statistical/Estimated Data (open source)
• Local building stock; archetype • Local statistics on Gross Floor Area • Regional level data • Measured demand data from energy suppliers • Current heat supply technology	• Energy Suppliers/Municipal Utilities • Estimations from research studies • Local and regional Energy Ministry • Survey (Census data) • Local level energy balance • Local Waste Management and Industries	• Hotmaps • Thermos • PETA Heat • Energy mosaic Austria

Inventory Analysis

Energy and Green House Gas Balance

- Status Quo Heat demand
- Sectoral Energy Balance-Key Parameters
  - Final energy demand
  - Electricity Consumption for heating
  - RE use
  - Heat & Electricity Storage Capacity
  - Existing network status



Software facilitating balance sheet preparation

- CO2 Balancing with BICO2BW
- Climate Protection Planner, 2019
- ECOSPEED-Climate Software Solutions

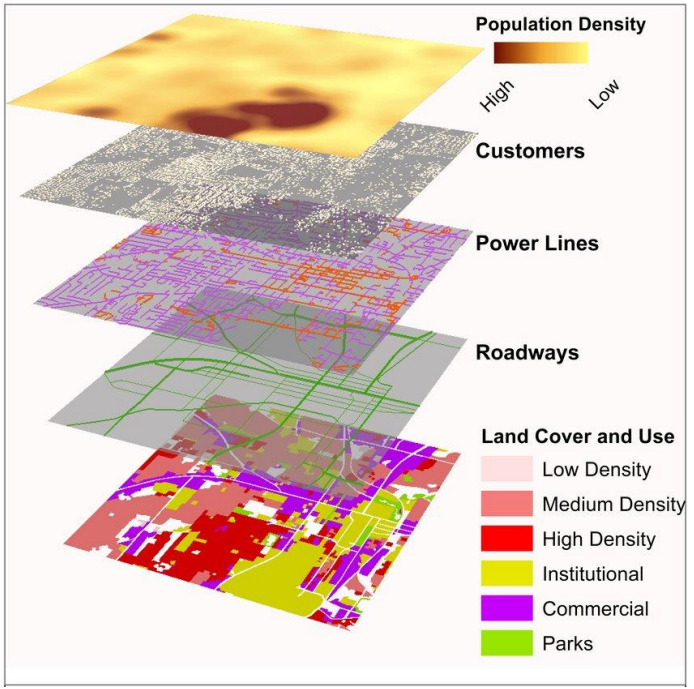
Inventory Analysis

Spatial Representation of Identified Data

- Development of settlement areas over time
- Living space per dwelling per primary end uses
- Information on existing infrastructure
- Residential land density
- Existing fiber-optic network
- Other Maps

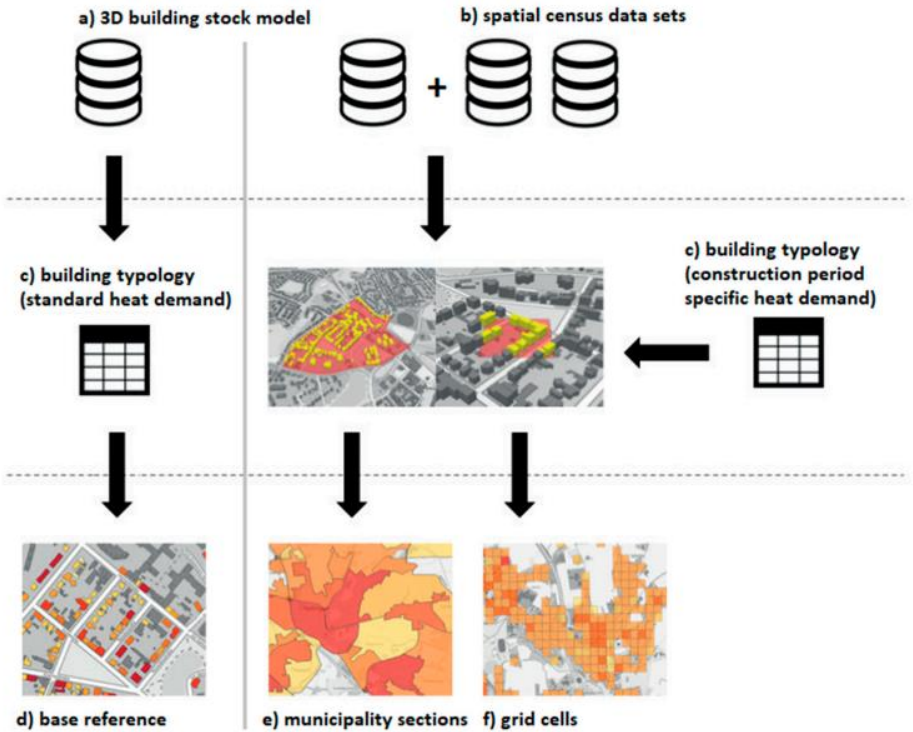
Potential Sources

- Local Survey
- National Statistics
- Spatial Census data sets
- Scientific Publications



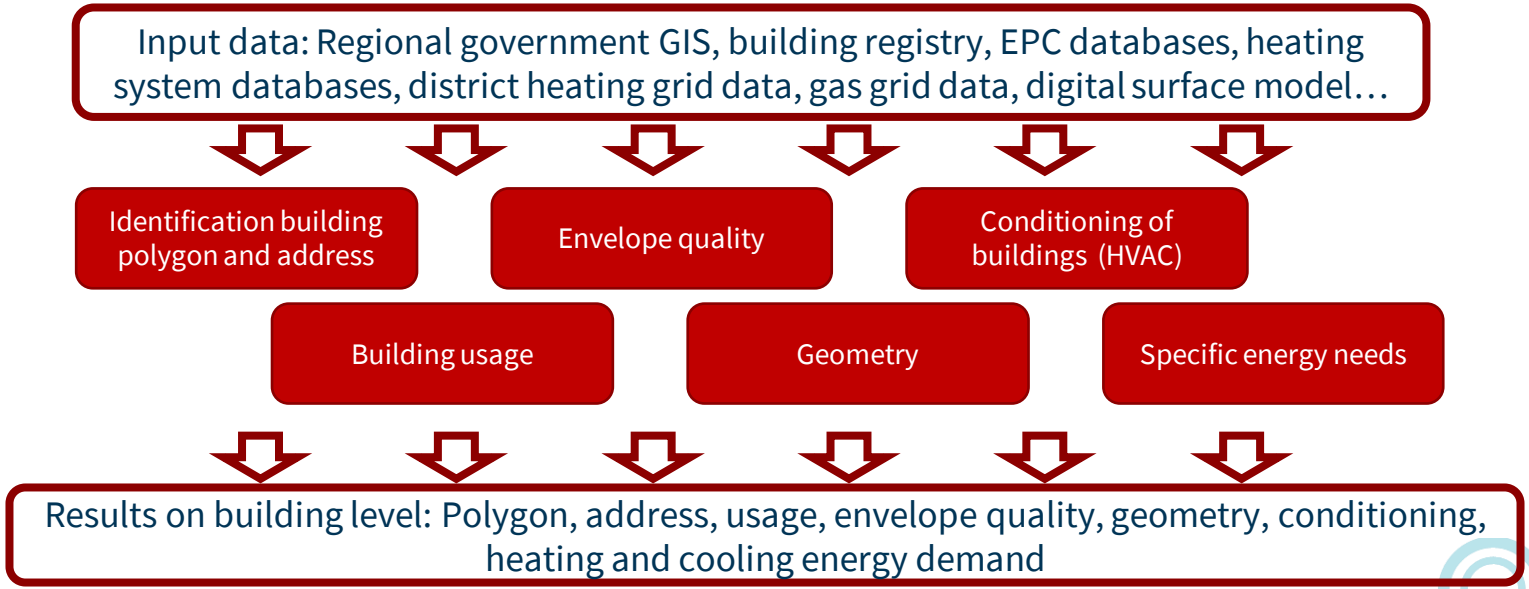
Source: Sriram,2019

Example: Building stock heat demand inventory



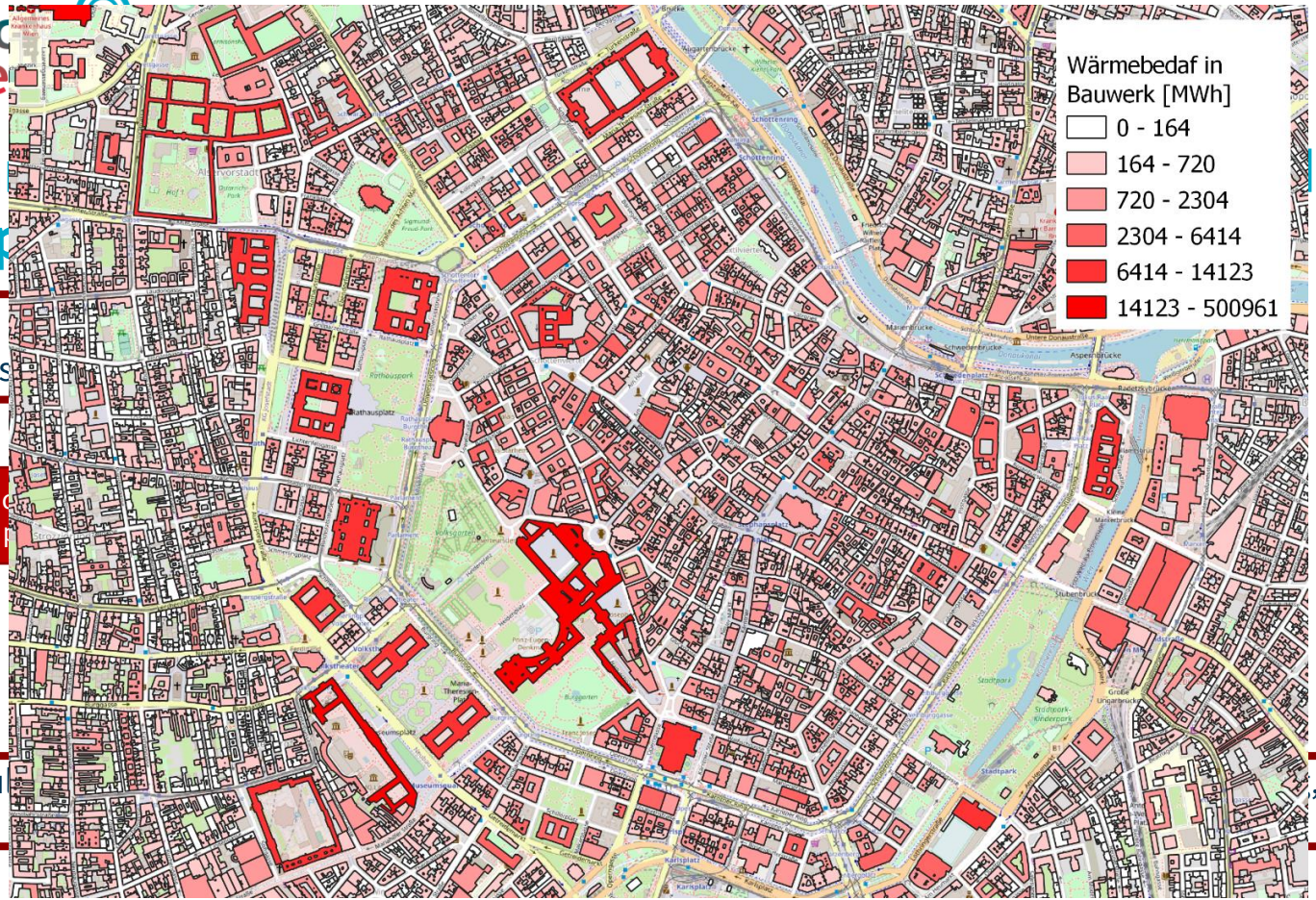
Source: Schwanebeck,2021

Example: Determining building Typology and heat demand maps on building level



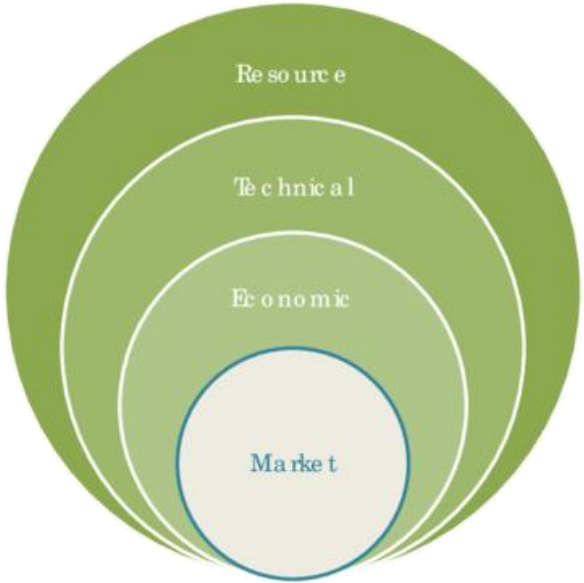
Source: Project Spatial Energy Planning (www.waermeplanung.at)

Exa emand map



Source: Project Spatial Energy Planning (www.waermeplanung.at)

Potential Analysis RE and Waste Heat



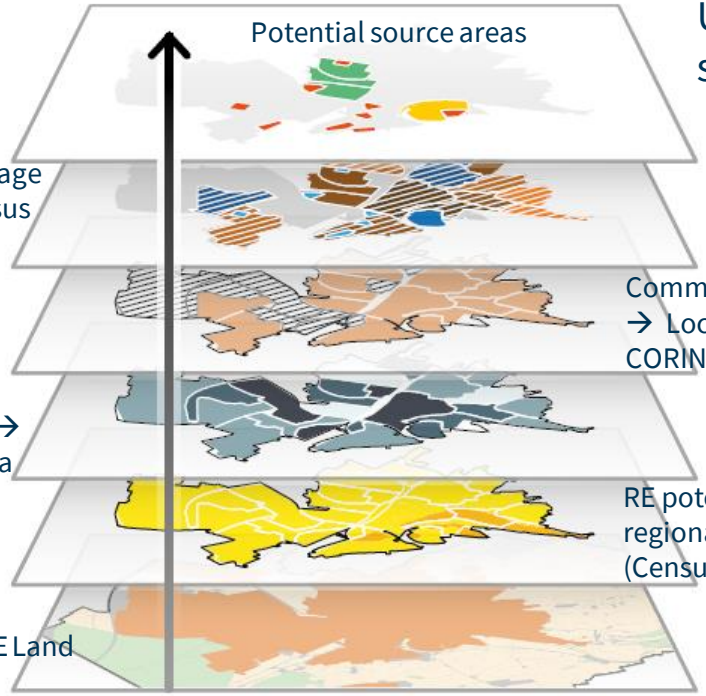
Potential Heat Supply Sources

- Biomass
- Geothermal
- Roof surface areas and solar heat
- Ambient heat
- Waste heat from industries
- Municipal Waste-Water

Potential Heat Supply Sources

Technology	Required Data	Potential Sources of Data
Biomass	• Additionally available biomass resources (forestry residues, industrial residues, agricultural residues) • Calorific Values per m3 or per ton of the source • Sewage and biogas distribution • Sectoral Biogas Use-Status Quo • Contribution of biogas to electricity generation	• Local or national biomass association (Data from Board of trustees technology, Austrian biomass association) • Energy Utilities • National Agriculture and forestry departments
Solar Thermal	• Available roof top area • Restrictions in use of roof top or open spaces	• Local or regional city planning committee • Solar thermal industry association • E.g. Methodology for detailed analysis available in: Bavarian Ministry of Environment and Health
Local Waste Heat	• Spatial Distribution of potential sources; distance from demand • Temperature level of heat supply • Potential In-house consumption • Data centers	• Industries with the heat source potential →data acquisition under the climate protection act
Wastewater Treatment	• Size of wastewater treatment plant • Desired level of heat pump size and current status	• Local or regional city planning committee
Other (low temperature) heat sources	• E.g. rivers, lakes or groundwater: temperature levels and possible achievable temperature differences	• Local or regional city planning committee; environmental departments

GIS-Indicator models

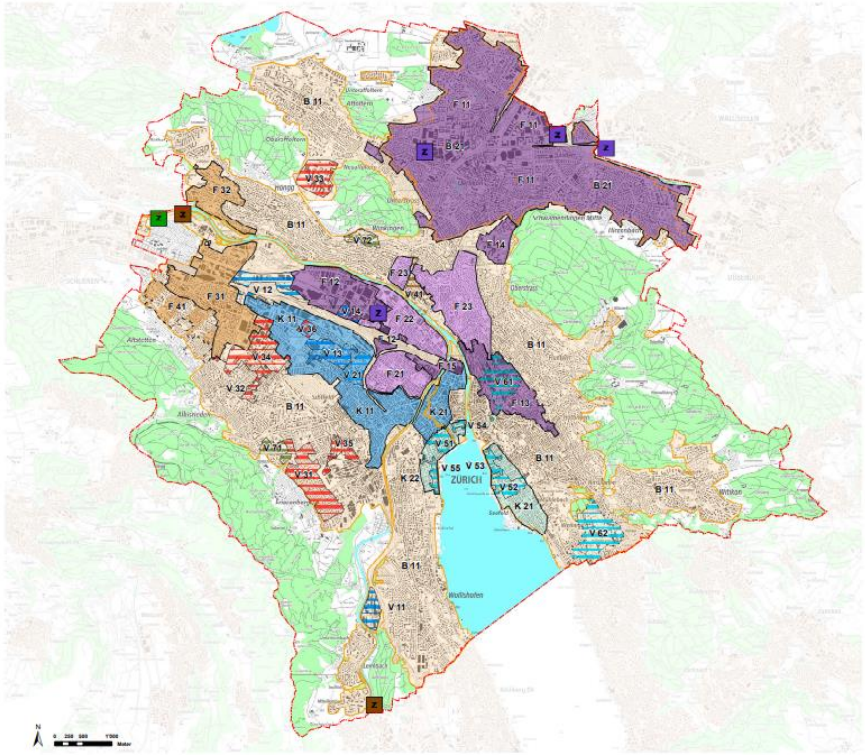


Use of exclusion criterion for the identifying the spatial distribution of Renewable supply potential

Advantages:

- Universally applicable
- Time Savings
- Adjustable to changes in policies and efficiencies

Example: Zurich



Conclusion

The analysis of the current state of the heat demand and supply …

- … supports the quantitative analysis of future H&C systems
- … provides an overview of the supply, demand and existing infrastructure
- … identifies cross-sectoral opportunities
- … identifies stakeholder willingness for collaboration
- … supports Risk Assessment

Thank you.

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www.actionheat.eu