

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

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17.03.2022



This project has received funding from the EU's Horizon 2020 programme under grant agreement no 101033706.

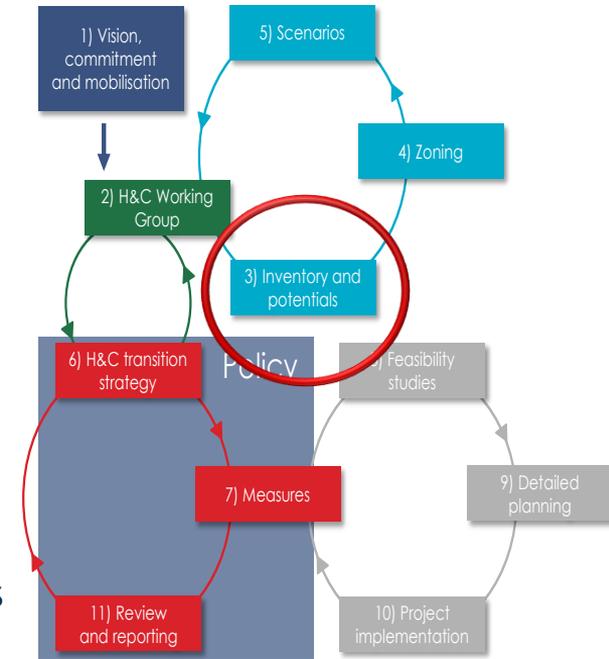


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Overview

- **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 ActionHeat project, 2022



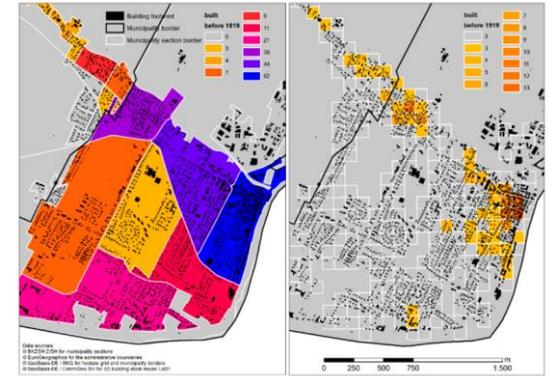
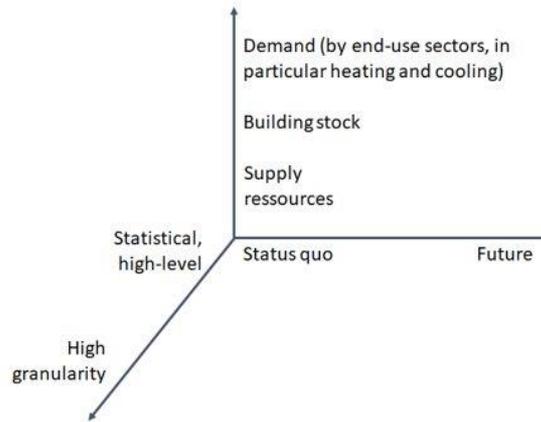
Inventory Analysis

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)
<ul style="list-style-type: none"> • Local building stock; archetype • Local statistics on Gross Floor Area • Regional level data • Measured demand data from energy suppliers • Current heat supply technology 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Hotmaps • Thermos • PETA Heat • Energy mosaic Austria



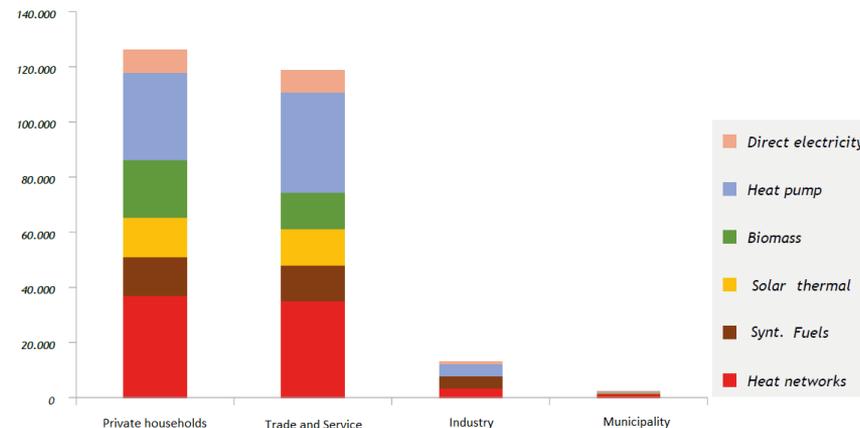
Inventory Analysis

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](#)



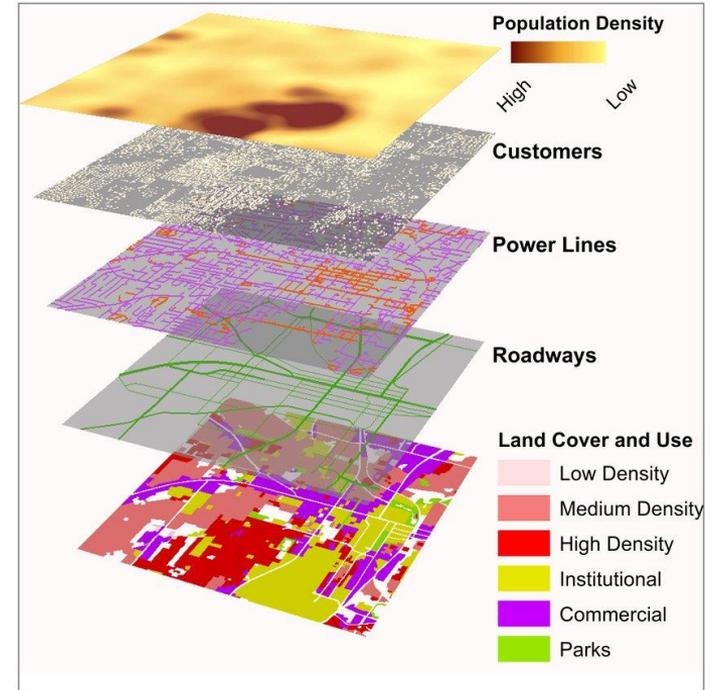
Inventory Analysis

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

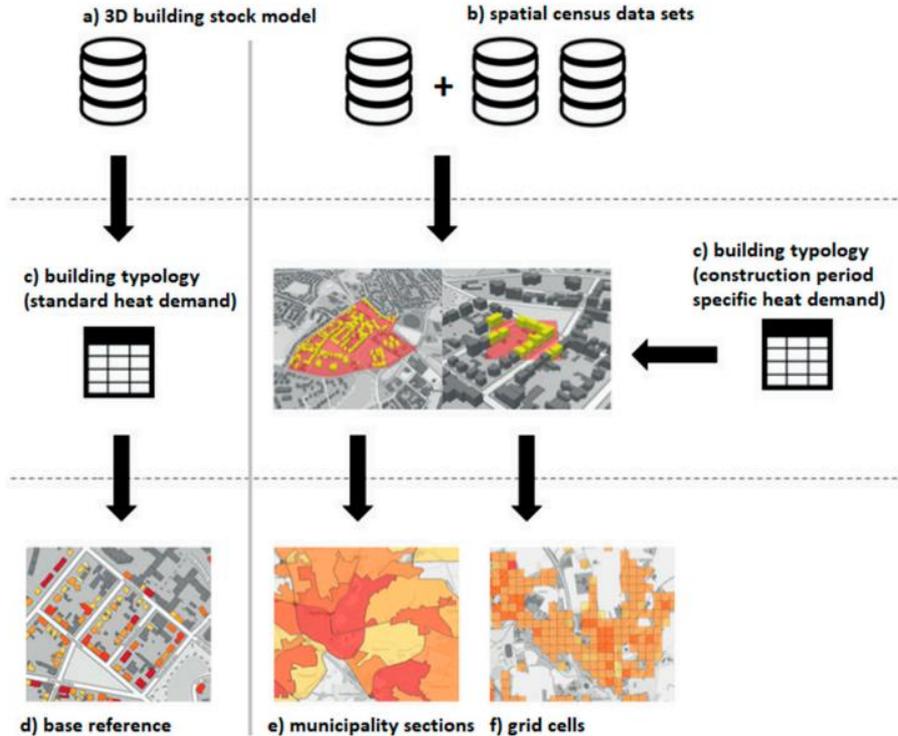
- Local Survey
- National Statistics
- Spatial Census data sets
- Scientific Publications



Source: Sriram,2019



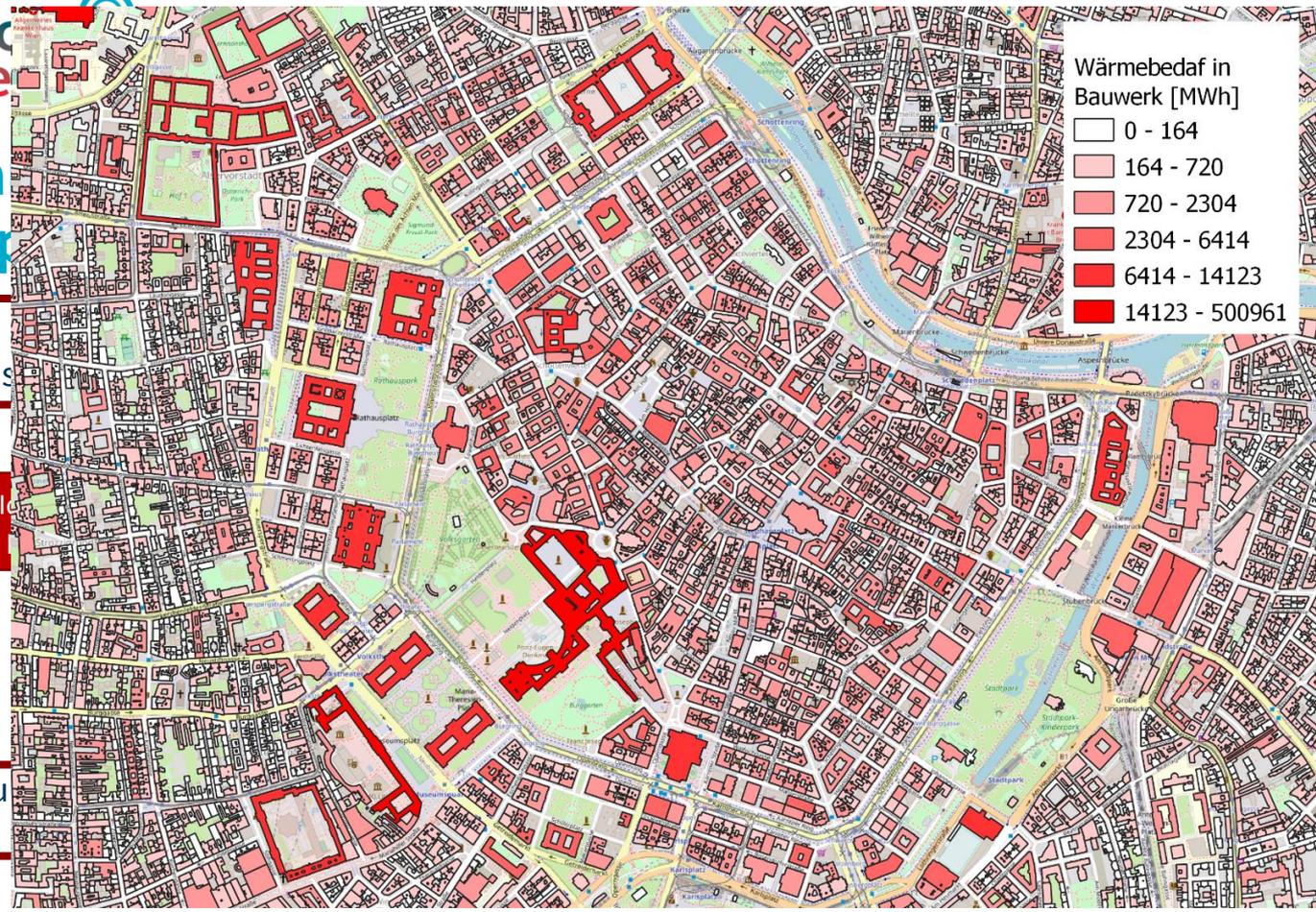
Example: Building stock heat demand inventory



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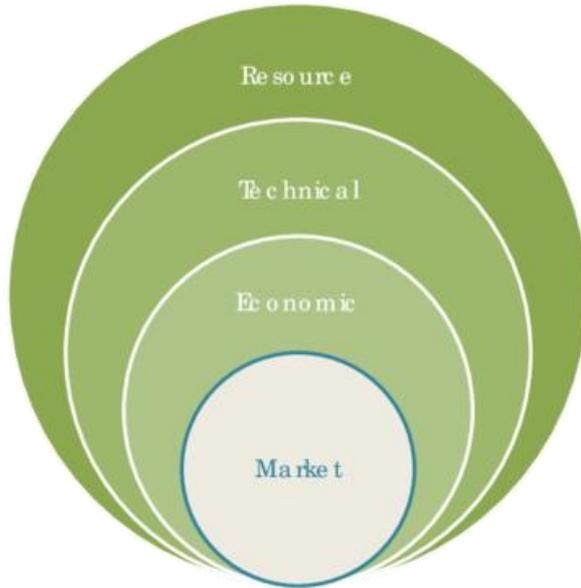


Source: Project Spatial Energy Planning
(www.waermeplanung.at)

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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



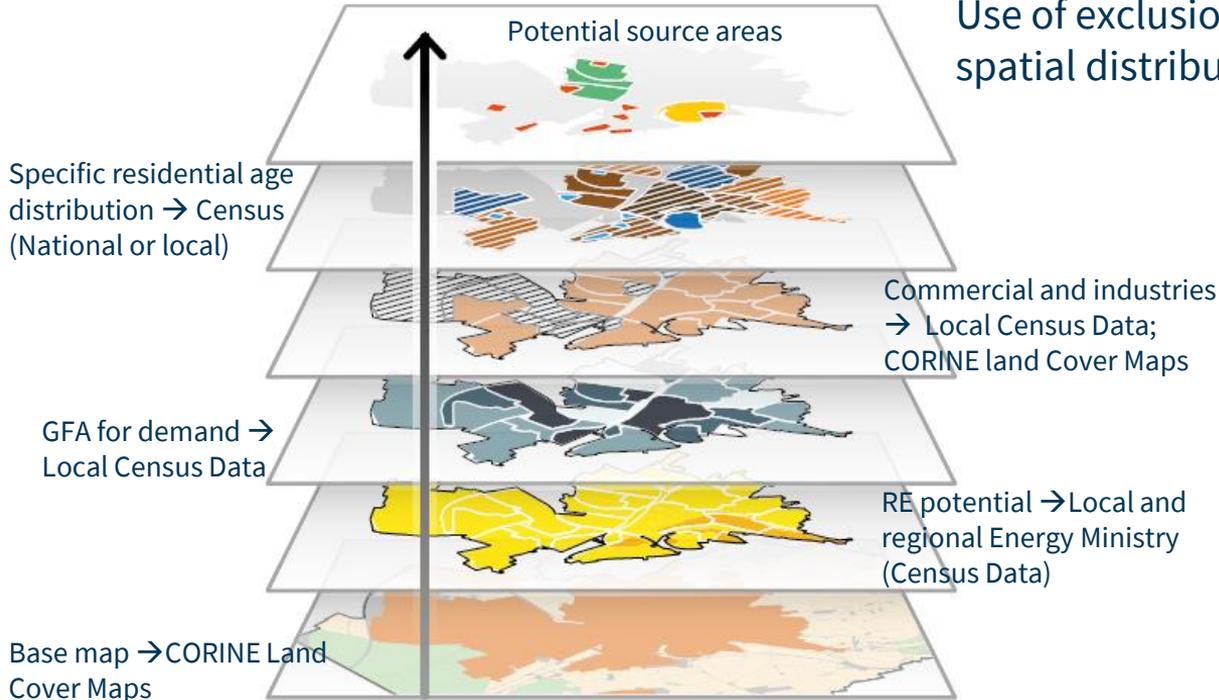
Potential Heat Supply Sources

Technology	Required Data	Potential Sources of Data
Biomass	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Local or national biomass association (Data from Board of trustees technology, Austrian biomass association) • Energy Utilities • National Agriculture and forestry departments
Solar Thermal	<ul style="list-style-type: none"> • Available roof top area • Restrictions in use of roof top or open spaces 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Spatial Distribution of potential sources; distance from demand • Temperature level of heat supply • Potential In-house consumption • Data centers 	<ul style="list-style-type: none"> • Industries with the heat source potential → data acquisition under the climate protection act
Wastewater Treatment	<ul style="list-style-type: none"> • Size of wastewater treatment plant • Desired level of heat pump size and current status 	<ul style="list-style-type: none"> • Local or regional city planning committee
Other (low temperature) heat sources	<ul style="list-style-type: none"> • E.g. rivers, lakes or groundwater: temperature levels and possible achievable temperature differences 	<ul style="list-style-type: none"> • 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

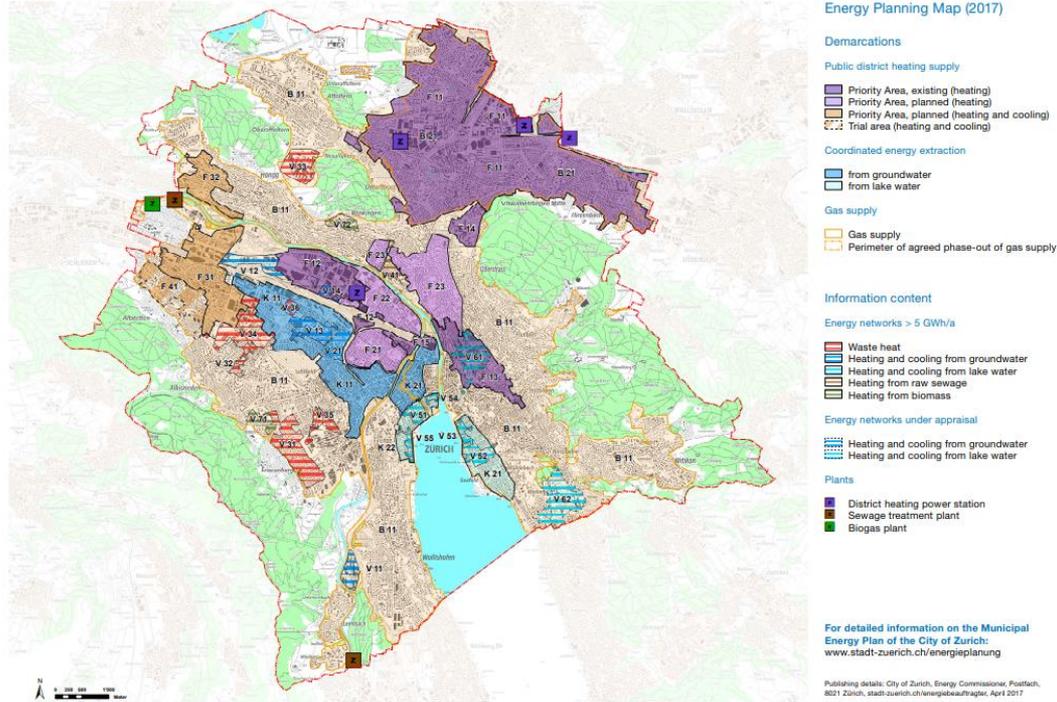


Advantages:

- 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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