Development of a data inventory for heat planning

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Agenda

Part I: Policy challenges, policy questions and related data needs

- Very short recap of the first webinar

Part II: Development of a data inventory at regional level for Austria (GEL/SEP)

- Input presentation:
  - Slideshow (overview, data model, validation, harmonization, module development, GDPR issues, validation, visualization, automatic reports)
  - Examples of results (Plausibility notebook, heat atlas, district report)
- Questions & Discussion:
  - Questions always possible, chat or orally
  - Focus of oral discussion potentially after specific blocks have been presented
  - Open discussion at the end

PART I

Policy challenges, questions and data needs

Case 1: Strategic Decision Making

Area	Objective	Data Used
EU – all MS	**Objective**: Improve database on current and potential future demand and supply for H/C **Activity**: Mapping H/C current and future demand and scenario for supply until 2030 (Fraunhofer ISI et al. 2017)	• heating demand on a national level split up to different building archetypes • heating and cooling energy demand for different industries (national) • National GDP, employment, investment costs, benefits- baseline) • existing subsides for H&C in place • current national level energy mix • solar thermal potential (national)
EU – selected MS	**Objective**: Develop efficient and effective policy instruments for driving implementation of nZEB standard, find replicable solutions for different countries in the EU **Activity**: Policy evaluation and optimisation for developing strategies to uptake nZEBs (TUW-EEG,2016)	• information regarding market development and characteristics of nZEBs was collected • renovation activities and quantity on national level • national level building stock data
National level	**Objective**: Provide a scenario of full decarbonisation of EU heating and cooling until 2050 **Activity**: A scenario of an EU with net-zero greenhouse gas emissions and its implications (UBA 2019)	• Baseline emission data • Total residential GFA • Specific heating and cooling demand for residential (average)
Regional / local level	**Objective**: Develop local and regional H&C strategies **Activity**: Hotmaps – Open-Source Tool for mapping and planning in Heating and Cooling	• Hectare level data on heat and cold demand generated for all EU-27, updated with local data based on estimated demand in buildings for case studies • Estimation of resource potentials based on EU studies and other local studies • Costs and prices from national level discussed with stakeholders

Case 2: Specific Decisions on Priority Zones

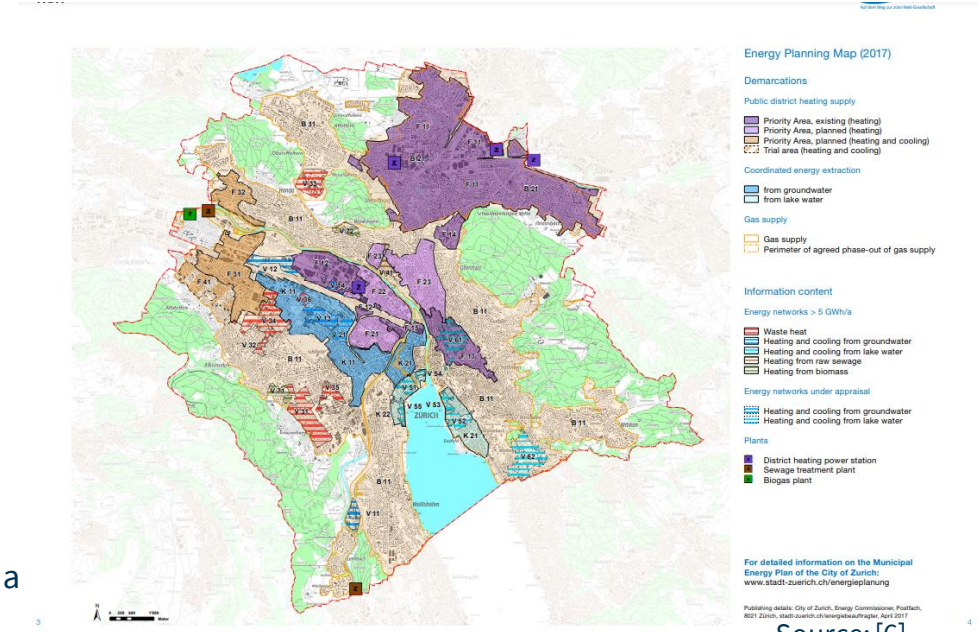
Objective

- Identify District Heating Zones
- Identify areas for retrofitting focus
- Local RE utilization (geothermal, solar)

Data Inputs—geospatial data

- Public district heating supply
- Gas Supply
- Resource potentials in the region
  - Ground water
  - Raw Sewage
  - Lake Water
  - Industrial waste heat
  - Biomass

Examples: **Zurich** identification of priority zones, **Denmark** to achieve low cost heating resulting from a high connection rate.



Source: [6]

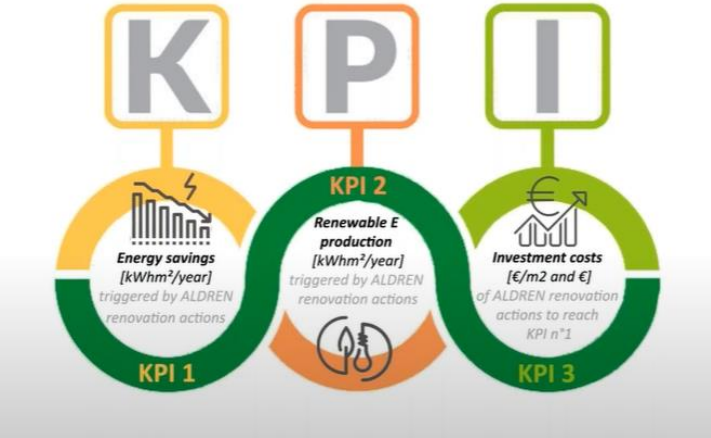
Case 3: Detailed technical design of network

City	Jelgava	Berlin	Alba Iulia
Scale	Entire City	16 buildings	Few neighboring buildings
Objectives	Reduce CO2 emissions and increase energy efficiency and RE supply.	Phase out coal powered district heating by 2030	Reduce building Energy demand
Data used (Source; Type)	• Building footprint (OSM; Public) • Network Path (OSM; Public) • LIDAR (Municipality; Private) • Building demand (Thermos Default) • Heating Tariff (Heating Service Provider; Public) • Pipe costs (Fortum and external experts; Private)	• Building footprint (Data from district heating provider; Private) • Network Path (OSM; Public) • LIDAR (Berlin Lidar Data) • Building demand (Calculation based on VDI 2067; Private) • Heating Tariff (Heating Service Provider; Private) • Pipe costs (Thermos Default Data)	• Building footprint (OSM; Public) • Network Path (OSM; Public) • Building demand (Thermos Default) • Heating Tariff (Real data; Private) • Pipe costs (Thermos data; Public)

Source: [5]

Case 4: Deploy Building Renovation Passports

- The ALDREN BRP as a tool:
  - To inform and motivate building owners/investors to undertake renovation
  - By which the government can bring tangible support to customers
  - Common European Solution
- Components of the BRP
  - LogBook: collection of data to better inform owners about current technical energy
  - RenoMap: Tailored renovation roadmap to reach desired energy performance levels
- B-log is a digital repository that includes building's (ownership, building design, materials used, structures, installations, systems, adaptations, investment, operational and maintenance costs, health and safety, performance indicators, certifications, etc.)→provides accessible comparative analysis



Source: [7]

	Case 1: Strategic decisions	Case 2: Setting priority zones	Case 3: DH technical planning	Case 4: building renovation passports
Data on existing heat / cold demand	• Regional energy balance (aggregated) • Hectare level data for assessing district heating potentials • (Calculated / measured demand data on single building level)	• Calculated demand data on single building level • Calculated demand data validated with measured consumption data		

Costs of heat distribution / DH vs. individual supply	• Estimation on hectare level based in heat demand density, gross floor area
	• Comparison of DH supply costs with individual supply costs
		• Estimation of heat distribution costs:
		  • Estimation based on type of district
		  • Estimation on hectare level based in heat demand density, gross floor area
		  • Estimation based on street level
		  • Account for location of currently existing network
		• Comparison of DH supply costs with individual supply costs
		  • for a single area vs. for entire city
		  • Using estimations of future prices vs. current prices
		  • …		

Data on resource potentials (renewable energy [RE] and heat sources)	• Total RE potential in the region available • Profiles for solar irradiance, temperatures of heat sources, …	• Location of potential resources and estimation based on literature study • Potential estimation based on measurements and (pre-feasibility studies) • Mix of both		
Data on demand reduction potentials	• Costs and potentials for heat demand savings in different building archetypes	• Costs and potentials for heat demand savings in different building archetypes allocated over the city area • …		

PART II

Development of a data inventory at regional level for Austria (GEL/SEP)

Thank you.

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www.actionheat.eu

Sources

[1] https://decarbcitypipes2050.eu/2021/07/22/the-data-driven-future-of-heat-planning/

[2] https://www.odyssee-mure.eu/events/workshops/vienna/heating-policies-policy-brief.pdf

[3] literature-Policy support for heating and cooling decarbonization

[4] Renewable space heating under the revised renewable energy directive

[5] https://www.thermos-project.eu/fileadmin/user_upload/THERMOS_City_Case_Studies_Oct2020.pdf

[6] Energy Planning Map, City Zurich, 2017

[7] https://aldren.eu/building-renovation-passport/

[8] https://www.researchgate.net/publication/337758104_Urban_energy_modelling_as_a_basis_for_future-oriented_city_planning