Co-creating indicators for an integrated energy transition

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Objective

To start shaping possible elements for the roadmap and Action Plan of the Partnership, focusing on ***HOW*** to better connect LHCPs and NBRPs.


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Main focus areas

- **Identify common indicators** that could support the integration of LHCP and NBRP.
- **Data ownership and challenges**.
- **Methodological approach** needed to integrate both plans.
- **Build on existing tools and EU initiatives**.
- Start identifying **possible next steps** for the partnership roadmap.

Part 1 — Framing the Challenge: Why indicators matter for integration? (10 min)

- EU related policies: The challenge of integrating LHCPs and NBRPs
- The role of indicators in enabling better planning, monitoring and alignment
- Key findings from the research: data gaps in buildings and district energy systems
- The way forward: Improving Data collection and standardisation

Part 2 — Indicator Prioritisation Lab (40 min)

Part 3 — From Indicators to Action (10 min)

Part 1 - Framing the Challenge: Why indicators matter for integration?

Policy context

Since 2017 decarbonisation of the building stock in the EU can be observed, albeit not at all at the speed required. Considering the strong catch-up needed to stay on track with the climate-neutrality path by 2050, there is no time to lose. The only way to keep the promises of the Paris Agreement alive is to pick up speed, adopt bold policies and stop delaying actions.

Policy context

Energy Efficiency Directive (EED) → LHCPs	Energy Performance of Buildings Directive (EPBD) → NBRPs
Mandatory local heating and cooling plans for large municipalities (>45.000)	Long-term strategy to decarbonise the building stock. Mandatory for EU Members States; non-compulsory for cities.
Focus on: • Decarbonisation of heating and cooling • Identification of efficient district heating and cooling areas • Integration of renewable and waste heat sources	Focus on: • Increasing renovation rates and depth • Improving energy performance of buildings • Addressing energy poverty
Requires detailed, spatial and local-level data	**Based on national-level data and building stock analysis**

GAP art 25 (6) EED

Compliance checklist for LHCPs

- ✓ Estimate and mapping of the potential
- ✓ Compliance with EE first principle
- ✓ Strategy development for implementation
- ✓ Quadruple helix approach
- ✓ Existing infrastructure
- ✓ Needs of local communities
- ✓ Role of energy communities
- ✓ Appliances in local building stock
- ✓ Vulnerable buildings
- ✓ Financing mechanisms
- ✓ Transition pathway → Goals
- ✓ Replace inefficient HC systems in public buildings
- ✓ Synergies for joint investment assessment with neighboring authorities

Compliance checklist for NBRPs

- ✓ **Strategic & policy framework (2050 horizon + intermediate targets)**
- ✓ **Building stock snalysis**
- ✓ **Renovation strategy & measures**
- ✓ **Social & equity dimension: vulnerable households, affordability of renovation, social impacts**
- ✓ **Financing & economic framework: PP financing instruments, cost-effectiveness analysis**
- ✓ **Data, indicators & monitoring (Anex II)**
  - Energy consumption and savings
  - GHG emissions
  - Renovation rates and depth
- ✓ **Governance & implementation: coordination mechanisms**

Integration Challenge

LHCPs and NBRPs address the same buildings and energy systems

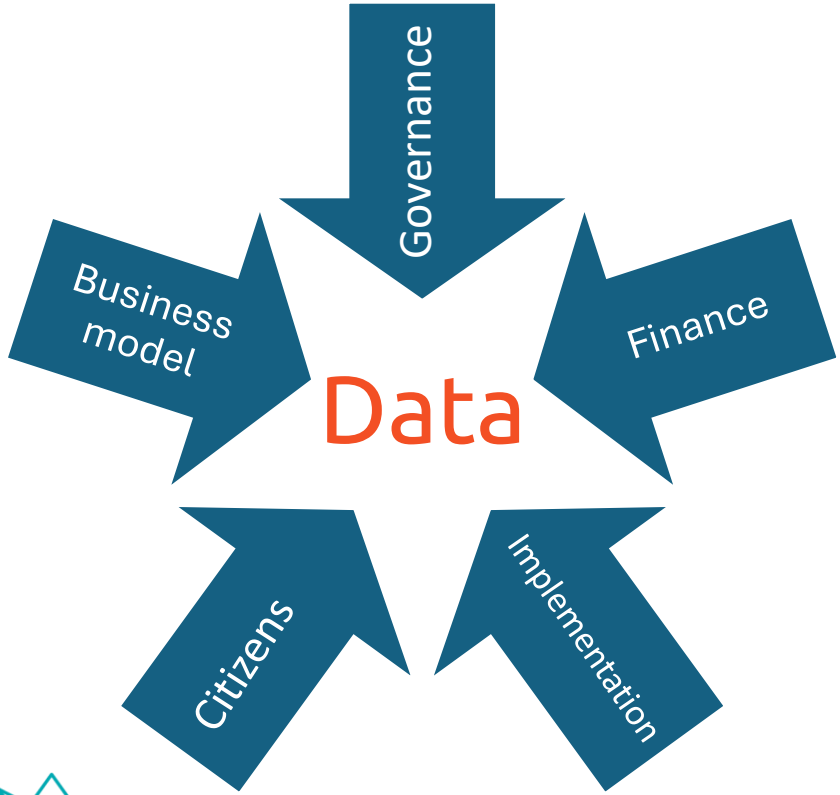
But:

- Operate at different governance levels (local vs national)
- Use different datasets and indicators

→ Risk of misalignment in planning and implementation

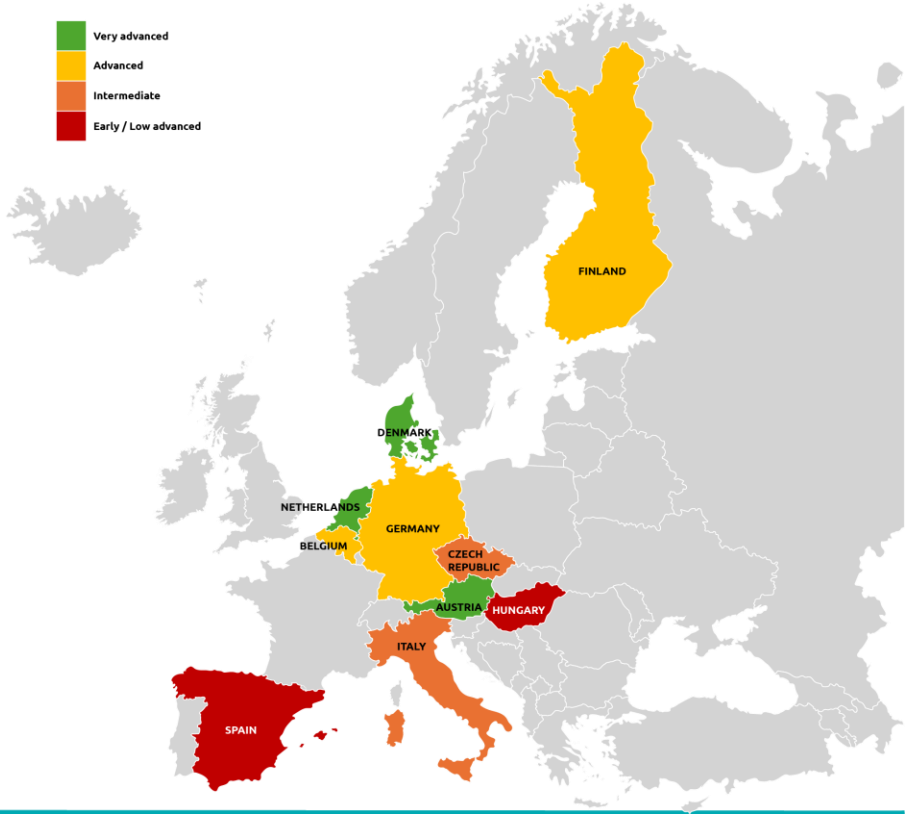
Bridging the gap between energy infrastructure and end users

The role of indicators



Key findings from research analysis

- Integration maturity between the two plans
  - Germany
  - Denmark
  - Netherlands
  - Austria
  - Belgium
  - Finland
  - Czech Republic
  - Spain
  - Hungary
  - Italy



Key findings from research analysis

❑ Key Data Gaps

- **Building stock characteristics**: Age, typology, renovation depth, and occupancy data are often missing or modeled, rather than measured.
- **Energy performance and consumption**: Lack of granular, building-level energy data; real consumption often differs from modeled data.
- **Heating systems and network connections**: Not consistently registered or accessible, making district heating planning challenging.
- **Socio-economic indicators**: Vulnerability, income, and occupancy patterns are rarely integrated with energy data.
- **Digital infrastructure**: Absence of centralized, interoperable repositories or digital logbooks for renovations.

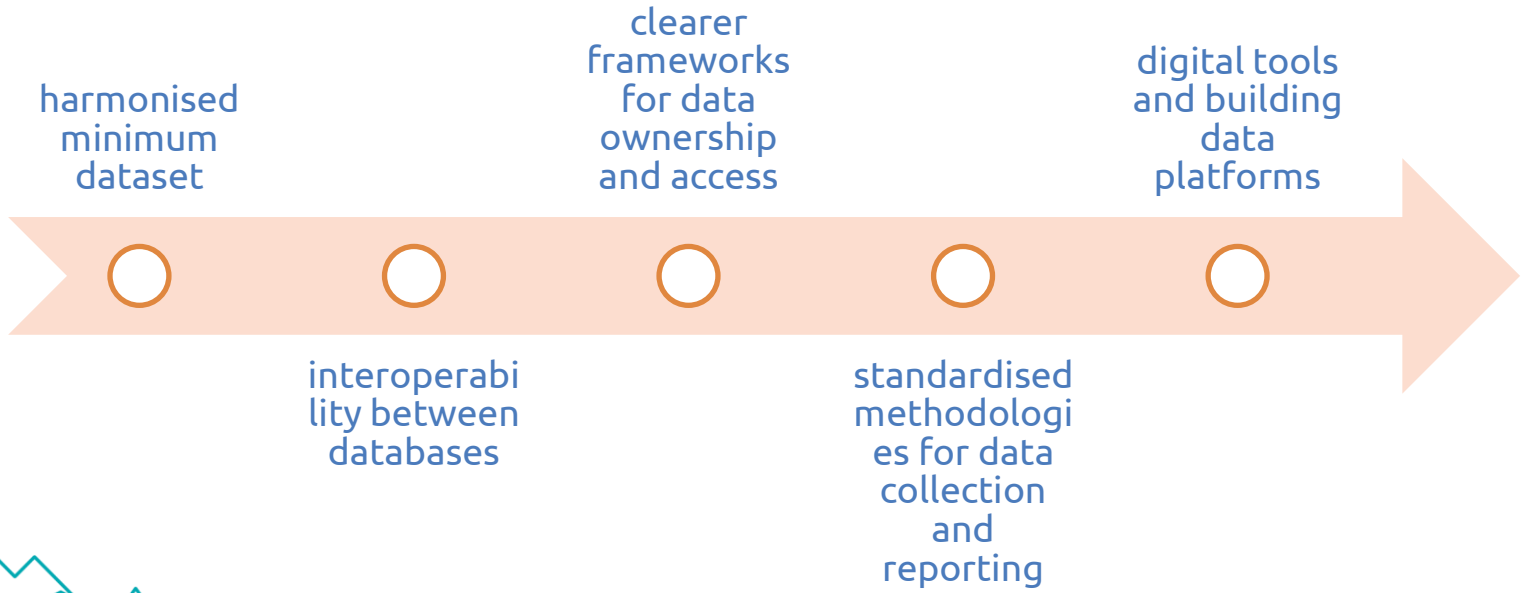
Key findings from research analysis

❑ Key Barriers

- **Legal and regulatory constraints:** GDPR, fragmented ownership, property rights, and sector-specific regulations often limit access to detailed energy data.
- **Fragmented governance and coordination**: Municipalities, regions, and national authorities often operate in silos.
- **Limited technical capacity**: Small municipalities may lack personnel or expertise to collect, process, and use complex datasets.
- **Financial constraints**: Municipalities often cannot fund monitoring systems or data integration initiatives.
- **Stakeholder and social engagement challenges**: Without citizen buy-in, participatory approaches fail, and data from energy communities or co-owned buildings is incomplete.

Key findings from research analysis

❑ Improving Data collection and standardisation



Data availability

- Case 1: Hardly any data is available
  → estimations
- Case 2: Partial consumption data available
- Case 3: A digital twin is available
  (each building mapped with measured data)

Future heat demand!

Data availability

Relevant areas for Data

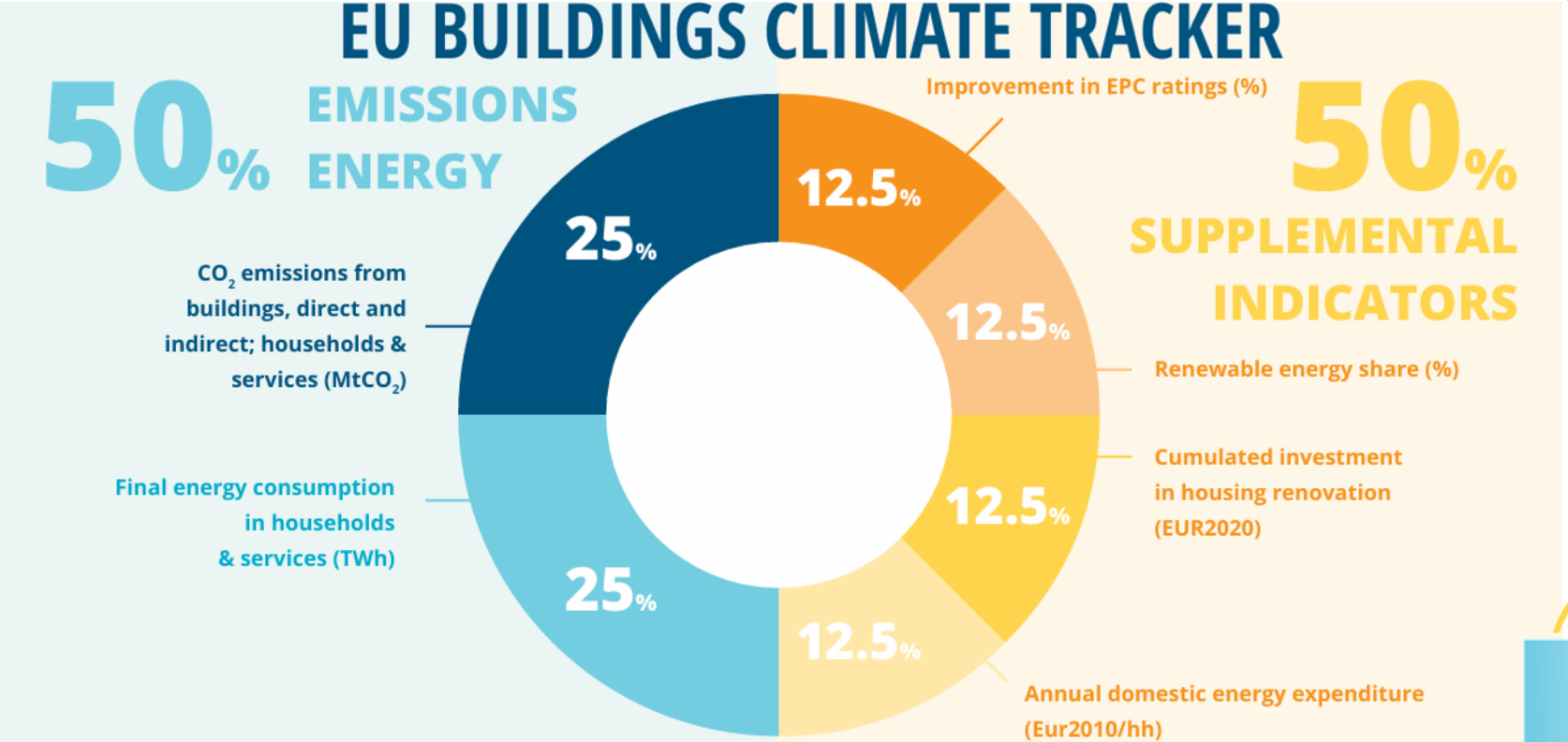
Current situation and goals	Energy demand (mostly heat)	Cooling - not yet integrated!
Energy supply	Energy related infrastructure	Energy potentials

Part 2 - Indicator Prioritisation Lab

Objective

Which indicators are essential for effectively integrating LHCPs & NBRPs?

References to consider



References to consider

EU BUILDINGS CLIMATE TRACKER

- EU coverage: the data source should cover many Member States or the EU as a whole
- Reliability: the data should be of high quality and the data provider of good reputation
- Consistency: the data is available over successive years and across countries in a comparable way
- Continuity: the data source is regularly updated, at least annually
- Timeline: the data is available as of 2015 at least, the date chosen as reference year
- Quality: the data has undergone quality checks by the data publisher and missing data as well as outliers have been treated.

Instructions to participants

- **Review the preliminary list of indicators** derived from country research and policy analysis.
- **Identify 5 top priority indicators** that are essential for LHCP–NBRP integration.
- **Identify 5 secondary indicators** that may provide additional insights but are less critical.
- **Ensure a balanced selection** across sustainable development dimensions: environmental, social, economic.
- **Identification of data gaps and governance challenges**.

→ ***To consider data availability and reliability***.

Part 2 - Indicator Prioritisation Lab

1. Environmental Indicators

- Energy demand in buildings (MWh/year)
- Building energy performance (EPC distribution)
- Renovation rate (% of building stock/year)
- Depth of renovation (energy savings achieved)
- CO_2 emissions from buildings
- Share of renewable heating and cooling (%)
- District heating coverage (%)
- Electrification of heating systems (heat pump share)
- Heat demand density (for district heating planning)
- Renewable electricity production vs consumption balance
- Waste heat recovery potential
- Thermal storage capacity for heating systems
- Peak heat demand profiles
- Building energy demand by typology
- Real post-renovation energy consumption
- Energy performance gap (predicted vs actual)

Part 2 - Indicator Prioritisation Lab

2. Social Indicators

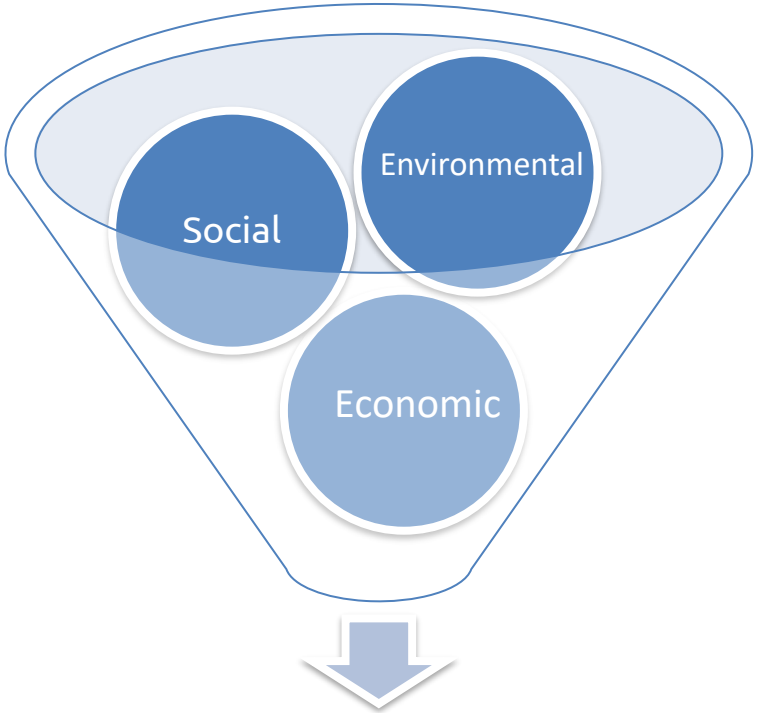
- Households affected by energy poverty
- Vulnerable households in inefficient buildings
- Access to efficient heating systems
- Renovation uptake in low-income households
- Citizen participation in renovation programmes
- Social acceptance of heating transition
- Participation in energy communities
- Affordability impacts of heating transition
- Housing tenure structure (owner / rental / cooperative)
- Behavioural programme participation

Part 2 - Indicator Prioritisation Lab

3. Economic Indicators

- Public investment in building renovation
- Private investment in renovation
- Renovation subsidy uptake
- Cost of renovation per building typology
- Employment in renovation sector
- Cost per tonne of CO_2 avoided
- Energy cost savings per household
- Cost of district heating expansion
- Economic return on renovation programmes
- Investment gap for building decarbonisation

Part 2 - Indicator Prioritisation Lab



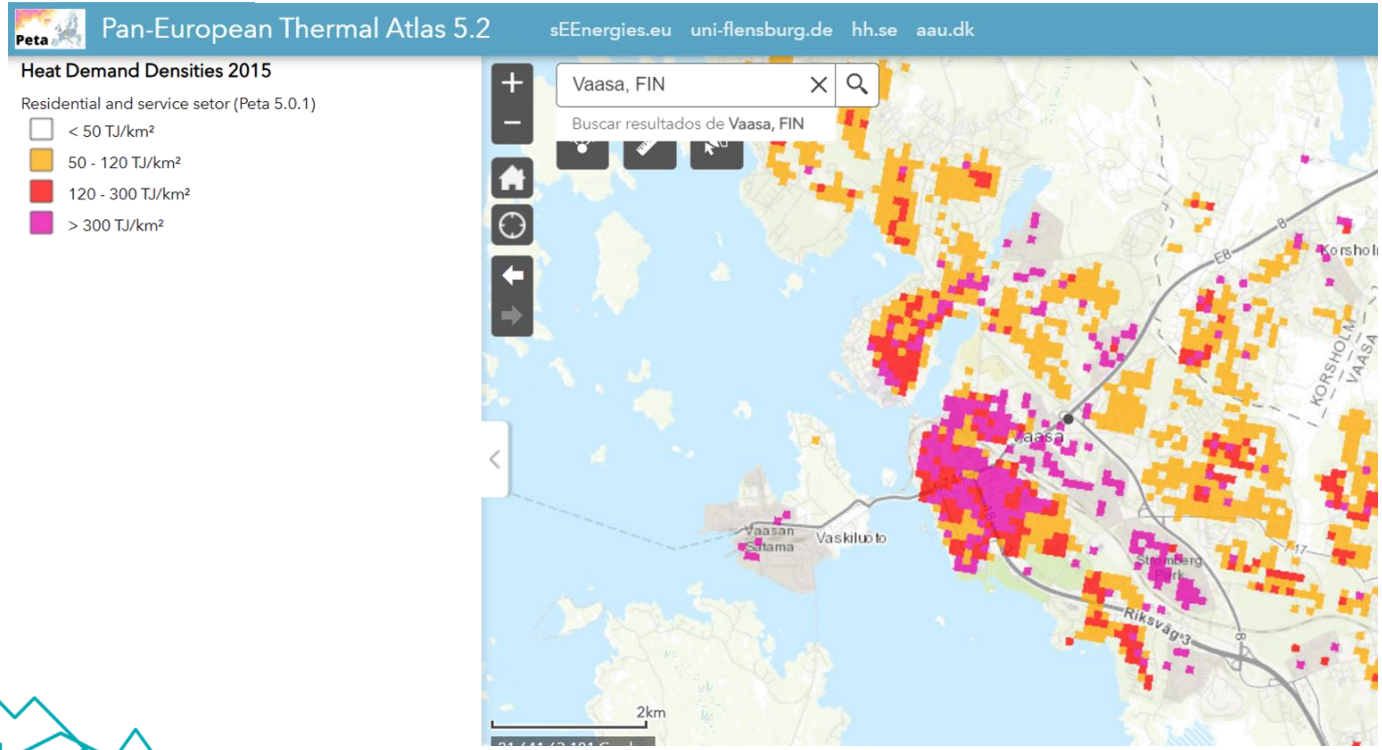
Part 2 - Indicator Prioritisation Lab

CATEGORY	5 TOP PRIORITY INDICATORS	5 SECONDARY INDICATORS	GOVERNANCE DATA		
			Ownership / Availability	Sources	Stakeholders involved
ENVIRONMENTAL					
SOCIAL					
ECONOMIC					

Part 3 - From Indicators to Action

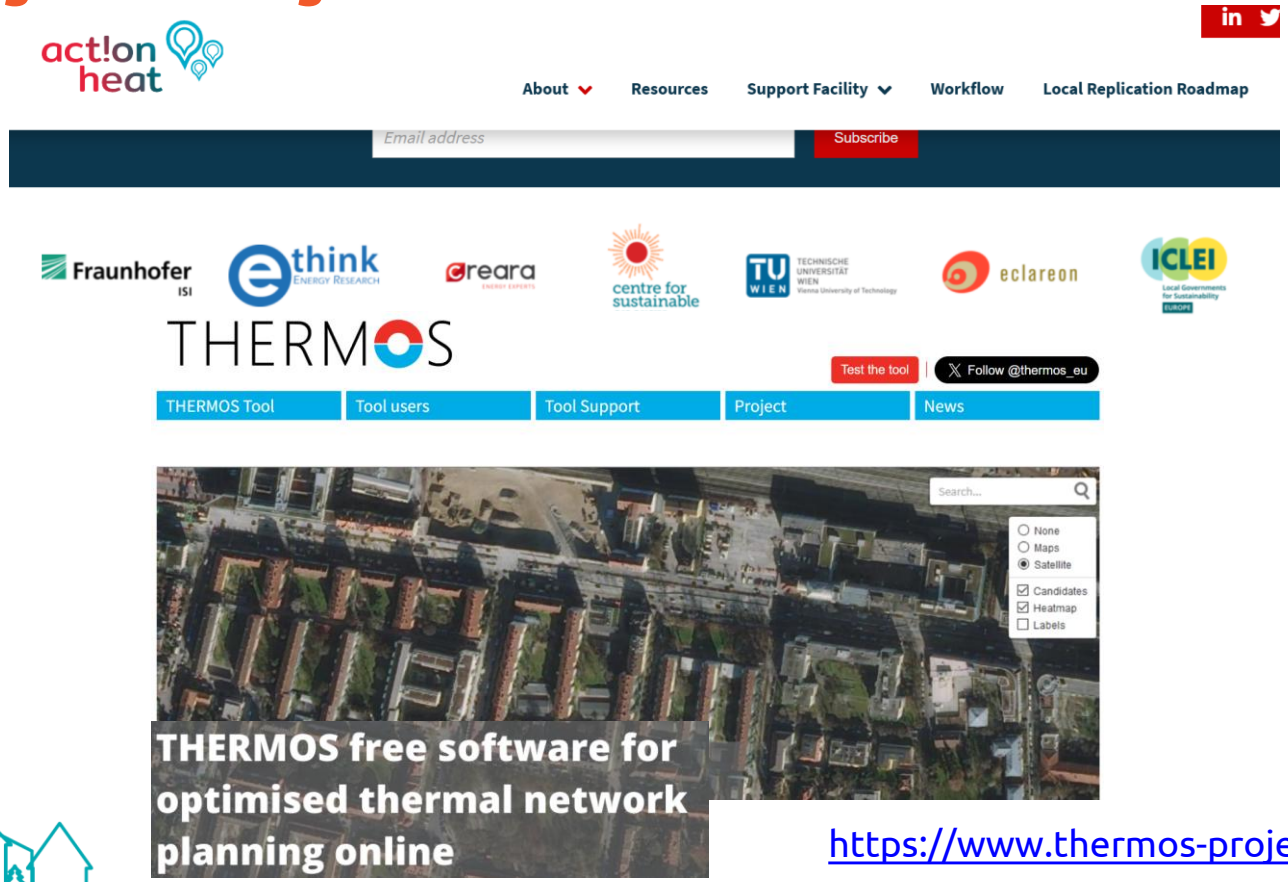
Building on existing EU Tools

Pan-European Thermal Atlas, Peta version 5.2



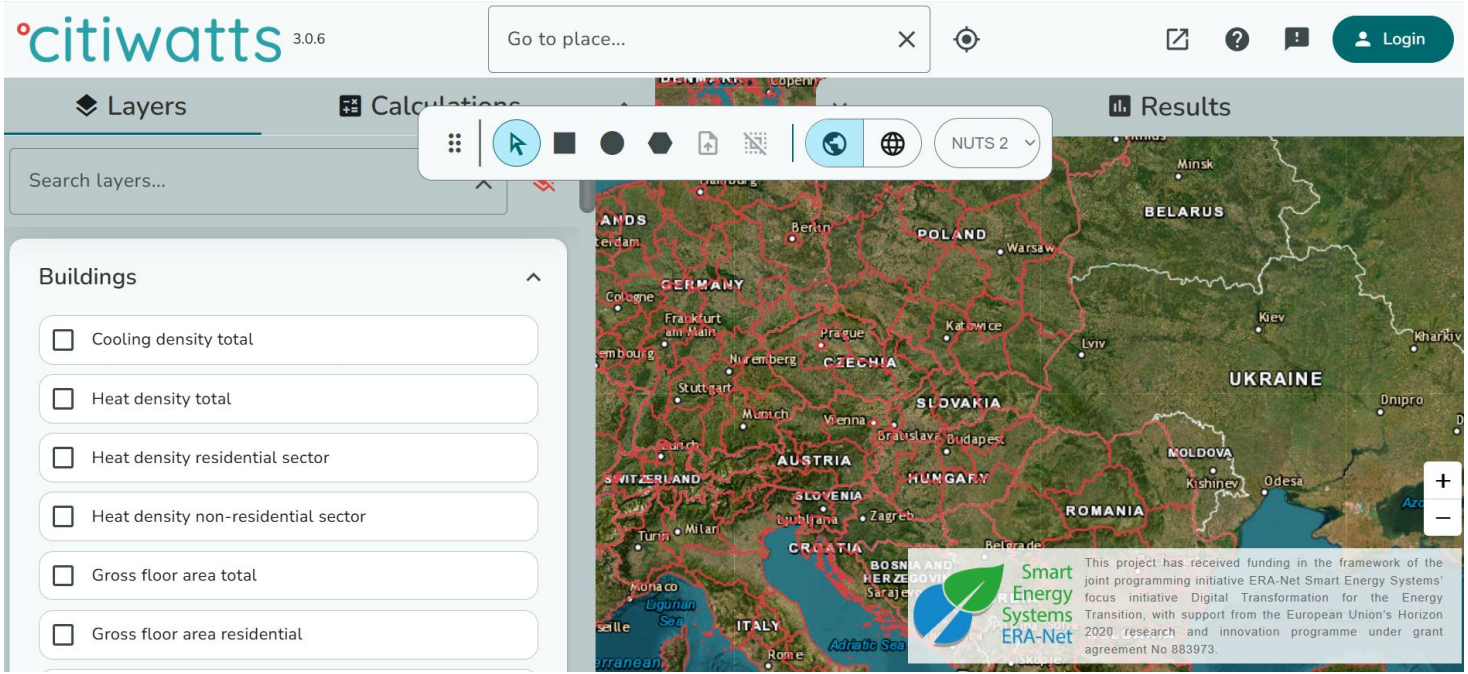
https://euf.maps.arcgis.com/apps/webappviewer/index.html?id=8d51f3708ea54fb9b732ba0c94409133

Building on existing EU Tools



https://www.thermos-project.eu/home/

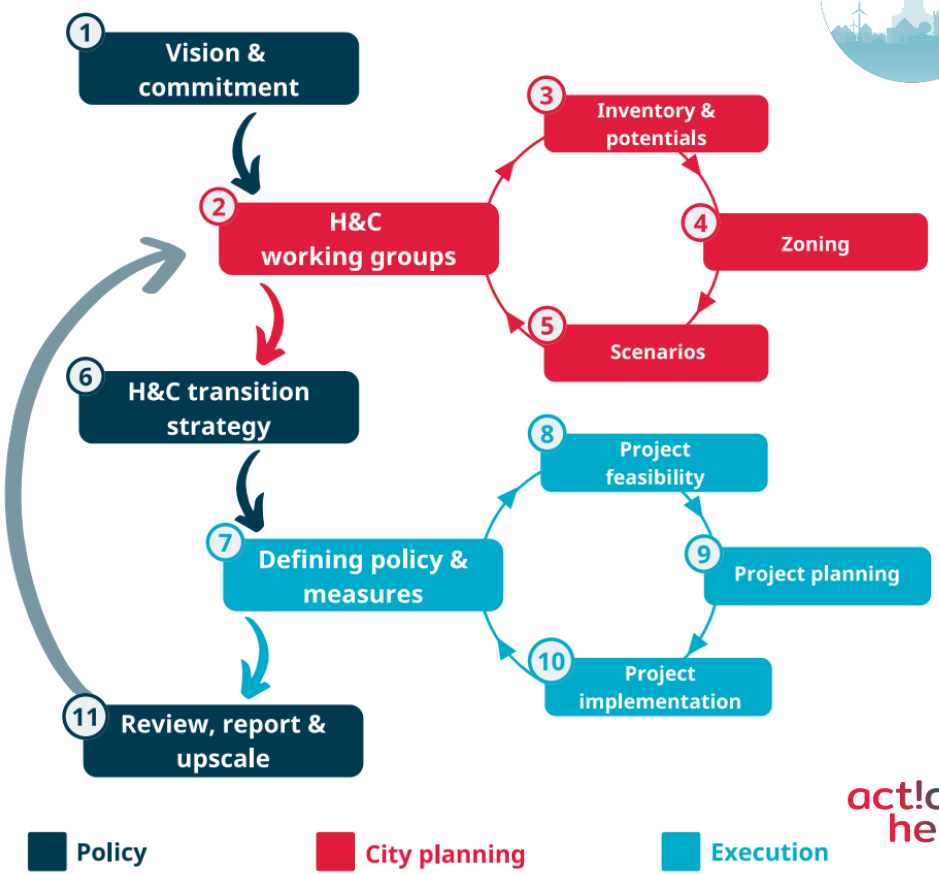
Building on existing EU Tools



https://citiwatts.eu/map

Building on existing EU initiatives

- Robust national planning
- Stakeholder engagement
- Regular monitoring



Part 3 - From Indicators to Action

What should be our next steps for an integrated data framework?

Wrap up!
Key Takeaways

Thank you for your attention!

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