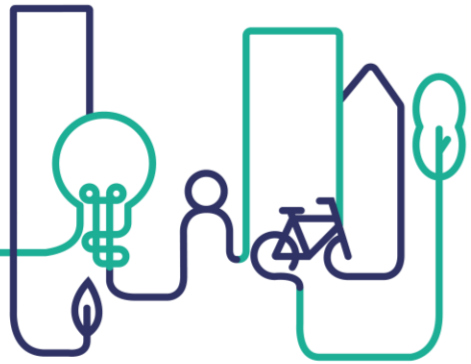
Building Decarbonisation

WG1_Webinar on bridging LHCPs and NBRPs: Insights from EU Member States



Co-funded by the European Union

Ana Contreras, EUI Expert

06th March 2026

TABLE OF CONTENTS

Objectives

1. **Map and analyse EU Case Studies to assess LHCPs and NBRPs integration**
2. **Identify data gaps and initial possible indicators**
3. **Extract lessons learned, best practices, challenges, and opportunities for better integration**
4. **Inform EU policymakers and DGs** about on-the-ground realities, supporting policy alignment with the integration of the two plans
5. **Foster synergies across Building Decarbonisation WGs and Urban Agenda partnerships** to accelerate climate action

Objectives

What are the potential benefits from integration?

Potential benefits

- Improve policy coherence and coordination between national strategies and local implementation.
- More efficient infrastructure planning.
- More effective investment strategies.
- Data management and evidence-based decision-making.
- Place citizens and building owners at the centre of the transition.

Activities completed

M1 –Case study mapping and analysis

- Identify/select 5–10 local cases where LHCPs and NBRPs have been integrated. Analyse selected cases to understand integration of methodologies, strategies, legislative frameworks, participatory processes, and multilevel governance structures.

- **Deliverable:** Initial mapping (Dec 2025) + Case Studies (Feb 2026)

M2 – Data gaps for buildings and energy

- From Case Studies, analyse the data to measure building performance and energy efficiency to reach building decarbonisation. Identify missing or inconsistent data at municipal/district level. Propose ways to improve data collection or standardisation. Review representative case studies to identify core elements, and variations.

- **Deliverable:** Case studies with key indicators and missing data + data gaps analysis in draft final report.

M3 – Workshop to co-develop solutions for data gaps + final report

- **Deliverable:** Final report compiling key conclusions and results.

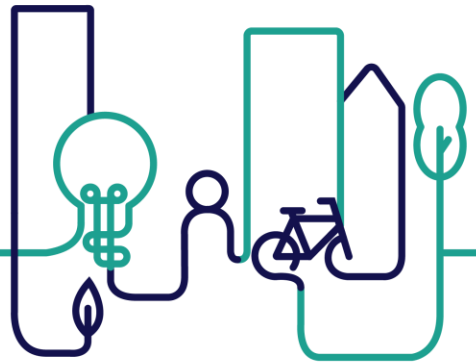
Activities

M1 – Case study mapping and analysis

Num	Country	National LHCP Strategy (status & main features)	National Building Renovation Plan (NBRP) (status & main features)	Integration LHCP ↔ NBRP (Methodological / Strategic logic)	Legislative Framework

Governance structure	Participatory processes	Leading Cities	References / Relevant links	Maturity Level	Justification (Key insights)	Pathways for replication

➢ 15 Preliminary EU Case Studies



Activities

M1 – Case study mapping and analysis

- Selected 10 EU Case Studies
- 29 interviews conducted

Germany
Denmark
Netherlands
Austria
Belgium
Finland
Czech Republic
Spain
Hungary
Italy

Activities

M1 – Case study mapping and analysis

Num	Country	Level covered	Relevant stakeholders	Num interviews completed
1	**Germany**	National; Regional; Local	Federal Office for Building and Regional Planning (BBR); IFEU - Institut für Energie- (Heidelberg); Lubeck University; Stuttgart región; Deutsche Energie-Agentur GmbH (dena); Ludwigsburg	**5**
2	**Denmark**	National; Local	Varme - Danish Energy Agency - part of The Ministry of Climate, Energy and Utilities ; Samso Municipality	**2**
3	**Netherlands**	National; Local	Ministry of Housing and Spatial Planning The Hague	**2**
4	**Austria**	Local	Stadt Wien	**1**
5	**Belgium**	National; Local	VVSG - (the Association of Flemish Cities and Municipalities); City of Mechelen; City of Oostende	**3**
6	**Finland**	National; Local	Ministry of the Environment; City of Espoo ; Vaasa Municipality	**2**
7	**Czech Republic**	Local	Czech Technical University in Prague (UCEEB); Statutory City of Kladno; City of Brno	**3**
8	**Spain**	National; Local	MIVAU - Ministry of Housing and Urban Agenda; IDAE; GBCE; Vitoria-Gasteiz City Council; Soria City Council; Santa Perpetua de Mogoda Municipality of Barcelona / ECOENERGIES	**8**
9	**Hungary**	National; Local	MEHI; Hungarian Energy Efficiency Institute (Budapest); City of Pecs; Ministry of Energy	**2**
10	**Italy**	National Local	ENEA - National research centre for energy in Italy; AMAT (Milan's Agency for Mobility and Environment)	**1**

Activities

M1 – Case study mapping and analysis

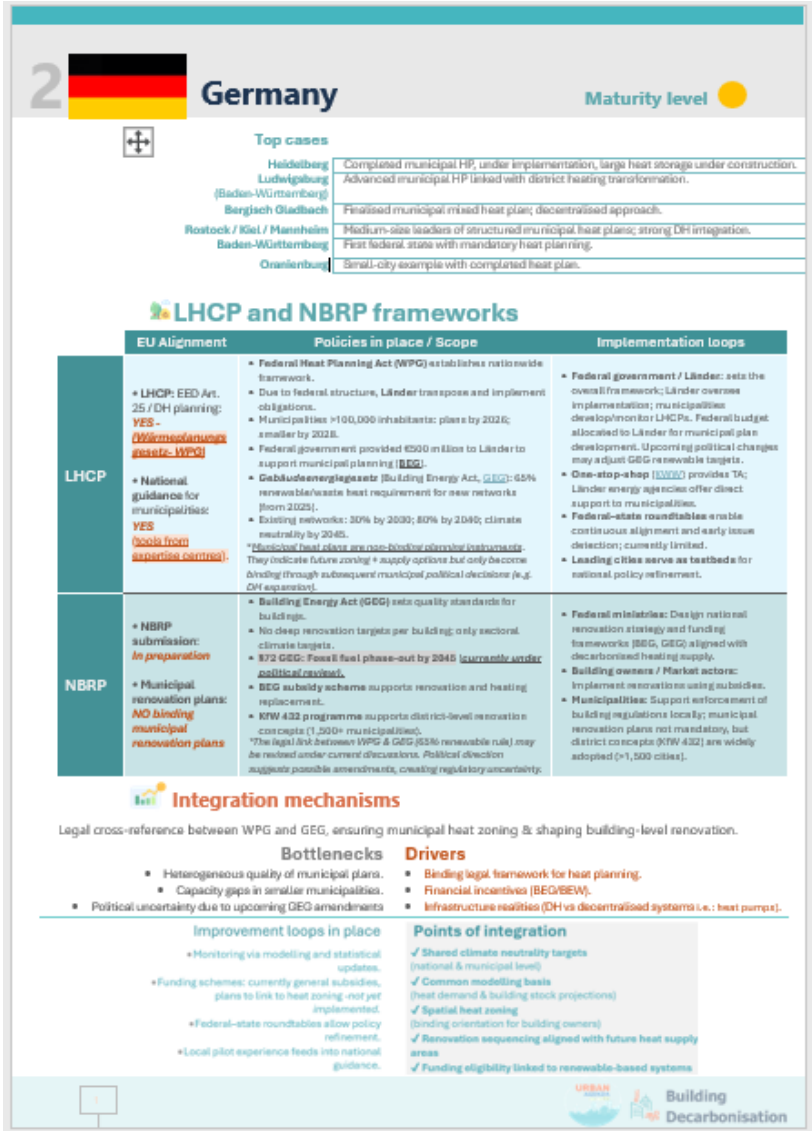
Interview logic

- Integration logic
- Legislative framework
- Multilevel Governance
- Participatory and stakeholder processes
- Data frameworks for Buildings and Energy
- Monitoring, reporting, and feedback loops
- Replication and transferability

Activities

M1 – Case study mapping and analysis

- LHCP and NBRP frameworks
- Integration mechanisms
- Key indicators
- Results
- Lessons learned
- Pathways for replication
- References and interviewers



2 Germany

Maturity level

Top cases

Heidelberg	Completed municipal HP, under implementation, large heat storage under construction.
Ludwigsburg (Baden-Württemberg)	Advanced municipal HP linked with district heating transformation.
Bergisch Gladbach	Finalised municipal mixed heat plan; decentralised approach.
Rostock / Kiel / Mannheim	Medium-size leaders of structured municipal heat plans; strong DH integration.
Baden-Württemberg	First federal state with mandatory heat planning.
Oranienburg	Small-city example with completed heat plan.

LHCP and NBRP frameworks

	EU Alignment	Policies in place / Scope	Implementation loops
LHCP	• LHCP: EED Art. 25 / DH planning: YES - (Wärmeplanungsgesetz - WPG) • National guidance for municipalities: YES (tools from expertise centres).	• Federal Heat Planning Act (WPG) establishes nationwide framework. • Due to federal structure, Länder transpose and implement obligations. • Municipalities >100,000 inhabitants: plans by 2026; smaller by 2028. • Federal government provided €500 million to Länder to support municipal planning (BEG). • Gebäudeenergiegesetz (Building Energy Act, GEG): 65% renewable/waste heat requirement for new networks (from 2025). • Existing networks: 30% by 2030; 80% by 2040; climate neutrality by 2045. *Municipal heat plans are non-binding planning instruments. They indicate future zoning + supply options but only become binding through subsequent municipal political decisions (e.g. DH expansion).	• Federal government / Länder: sets the overall framework; Länder oversee implementation; municipalities develop/monitor LHCPs. Federal budget allocated to Länder for municipal plan development. Upcoming political changes may adjust GEG renewable targets. • One-stop-shop (KNWI) provides TA; Länder energy agencies offer direct support to municipalities. • Federal–state roundtables enable continuous alignment and early issue detection; currently limited. • Leading cities serve as testbeds for national policy refinement.
NBRP	• NBRP submission: In preparation • Municipal renovation plans: NO binding municipal renovation plans	• Building Energy Act (GEG) sets quality standards for buildings. • No deep renovation targets per building; only sectoral climate targets. • §72 GEG: Fossil fuel phase-out by 2045 (currently under political review). • BEG subsidy scheme supports renovation and heating replacement. • KfW 432 programme supports district-level renovation concepts (1,500+ municipalities). *The legal link between WPG & GEG (65% renewable rule) may be revised under current discussions. Political direction suggests possible amendments, creating regulatory uncertainty.	• Federal ministries: Design national renovation strategy and funding frameworks (BEG, GEG) aligned with decarbonised heating supply. • Building owners / Market actors: Implement renovations using subsidies. • Municipalities: Support enforcement of building regulations locally; municipal renovation plans not mandatory, but district concepts (KfW 432) are widely adopted (>1,500 cities).

Integration mechanisms

Legal cross-reference between WPG and GEG, ensuring municipal heat zoning & shaping building-level renovation.

Bottlenecks
- Heterogeneous quality of municipal plans.
- Capacity gaps in smaller municipalities.
- Political uncertainty due to upcoming GEG amendments

Drivers
- Binding legal framework for heat planning.
- Financial incentives (BEG/BEW).
- Infrastructure realities (DH vs decentralised systems i.e.: heat pumps).

Improvement loops in place
- Monitoring via modelling and statistical updates.
- Funding schemes: currently general subsidies, plans to link to heat zoning -not yet implemented.
- Federal–state roundtables allow policy refinement.
- Local pilot experience feeds into national guidance.

Points of integration
- ✓ Shared climate neutrality targets (national & municipal level)
- ✓ Common modelling basis (heat demand & building stock projections)
- ✓ Spatial heat zoning (binding orientation for building owners)
- ✓ Renovation sequencing aligned with future heat supply areas
- ✓ Funding eligibility linked to renewable-based systems

Building Decarbonisation

2_Germany

Key Indicators

IN USE	MISSING
• MUNICIPAL HEAT DEMAND (MWH/YEAR) • RENEWABLE SHARE IN DISTRICT HEATING (%) • DISTRICT HEATING COVERAGE (%) • RENOVATION RATES (MONITORED NATIONALLY) • BEG FUNDING UPTAKE • HEATING SYSTEM REPLACEMENT RATES	• Heterogeneous assumptions on renovation depth across municipalities • Limited real-time heating system stock data • Vulnerability mapping not mandatory (tools exist, e.g. waermeguide.de) • No standardised cost-per-ton CO_2 metric

Data availability is relatively robust (Census, EPCs, statistics). Main constraint is regulatory and political uncertainty rather than data absence.

Results

- ✓ **First EU country with nationwide legally binding municipal HP framework.**
- ✓ **600+ published municipal heat plans** covering 1,341 municipalities (Dec 2025).
- ✓ **100+ municipalities completed plans** before federal obligation (notably Baden-Württemberg, Schleswig-Holstein).
- ✓ **Increasing renewable share in DH networks** (biomass, geothermal).
- ✓ **>1 million renovations** supported through BEG since 2020.

Data gaps remain the main constraint:

Lessons learned

Legal cross-linking works	Binding links between heat planning and building regulation support integration, but upcoming GEG changes may affect their scope.
Mandatory local plans create certainty	LHCPs guide decisions but are non-binding; only transformation planning has legal weight.
Technical support is critical	Länder-level advisory support is essential for smaller municipalities.
Funding alignment accelerates change	Subsidies incentivise decarbonised heating, though linking to LHCP zones is not yet implemented.
Data gaps remain the main constraint	Data exists, but political acceptance and multi-level integration remain challenges.

Pathways for replication

Interviews: Federal Office for Building and Regional Planning (BBR); Deutsche Energie-Agentur GmbH (DENA); IFEU – Institut für Energie- und Umweltforschung Heidelberg gGmbH; Lübeck University; Stuttgart Region

References: / BMWK – Heat Planning Overview / BEG – Bundesförderung für effiziente Gebäude / IFEU Report on 100 municipal heat plans / WPG Guidebook/ KfW 432 – Energy-efficient urban redevelopment

Building Decarbonisation

Activities

M1 – Case study mapping and analysis

Country	Feedback Received	Key Notes / Pending Actions
Denmark	Partial – National agency pending	Feedback from VARME will confirm national alignment; local-level feedback OK
Germany	Yes – validated	Fully reviewed
Netherlands	Yes – validated	Fully reviewed
Austria	Partial – feedback pending from City of Vienna	Local-level review pending
Belgium (Flanders)	Yes – validated	Fully reviewed
Finland	Yes – validated	Lessons learned and bottlenecks corrected per Ministry of Economic Affairs and Employment
Czech Republic	Yes – validated	Fully reviewed, ready for report
Italy	No formal feedback	Pending confirmation from ENEA and Milan's agency
Spain	Yes – validated	Fully reviewed
Hungary	Yes – validated	Fully reviewed, no changes needed

Activities

M2 –Data gaps for buildings and energy
M2 –Workshop to co-develop solutions for data gaps + Final Report

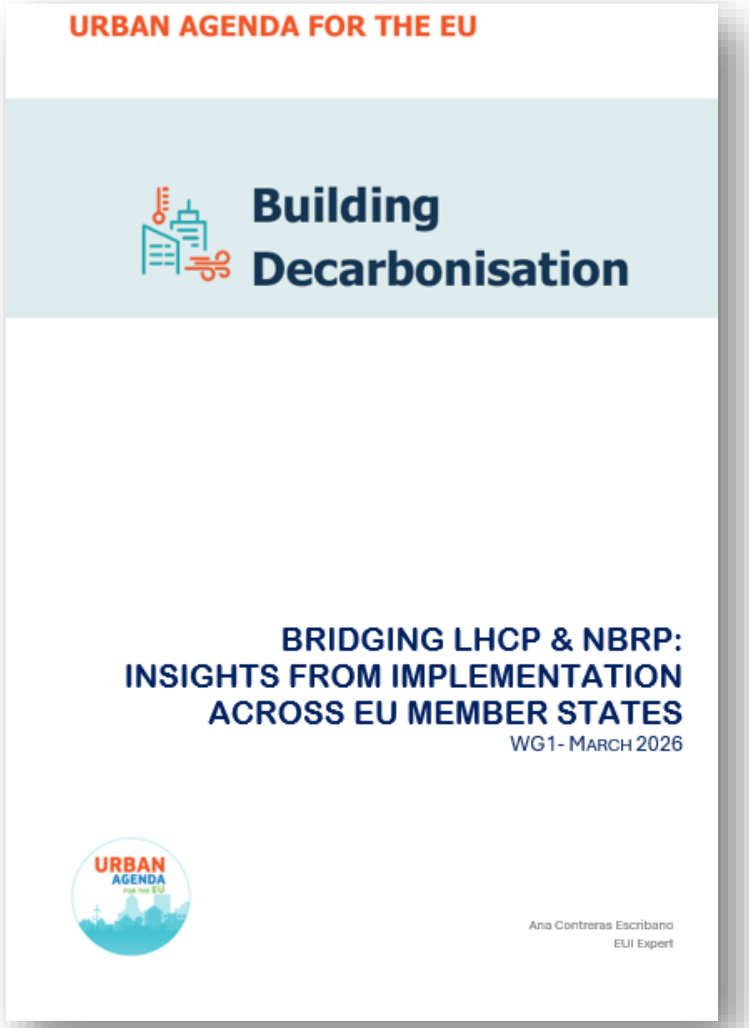


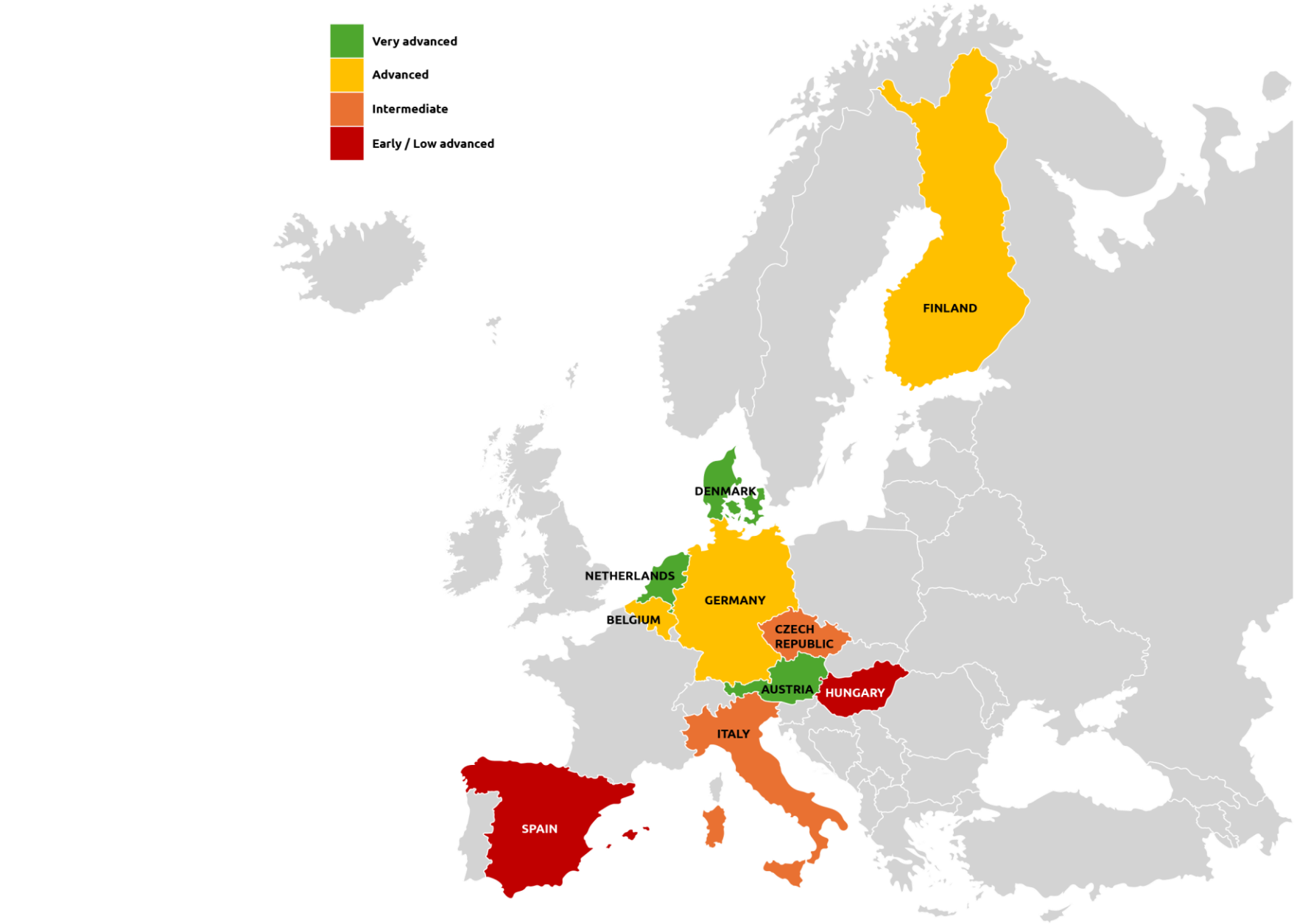
Table of contents

Analysis from the Case Studies

- ❑ Integration maturity between the two plans
- ❑ Alignment with EU Frameworks
- ❑ Integration mechanisms
- ❑ Key bottlenecks
- ❑ Drivers of integration
- ❑ Improvement Loops: how learning happens

Analysis from the Case Studies

- **Integration maturity between the two plans**

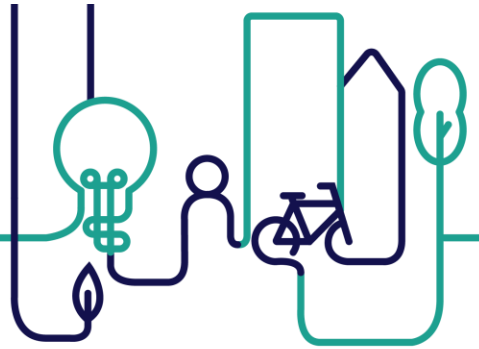


Analysis from the Case Studies

❑ Integration maturity between the two plans

Very advanced - Denmark, Netherlands, Austria

- Binding local heat planning frameworks.
- Clear national guidance for municipalities.
- Strong spatial zoning approaches.
- Funding conditionality linked to heat transition areas.
- Iterative improvement loops.
- Strong municipal technical capacity.

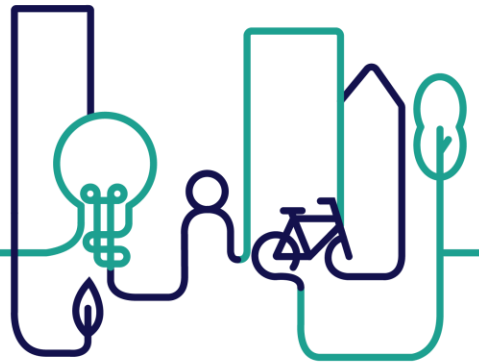


Analysis from the Case Studies

❑ Integration maturity between the two plans

Advanced – Germany, Finland, Belgium (Flemish Region)

- Formal transposition of EU directives.
- Growing heat planning requirements.
- Increasing alignment between renovation and heating strategies.
- Strong pilot cities or regions.
- Some fragmentation between ministries or funding schemes.

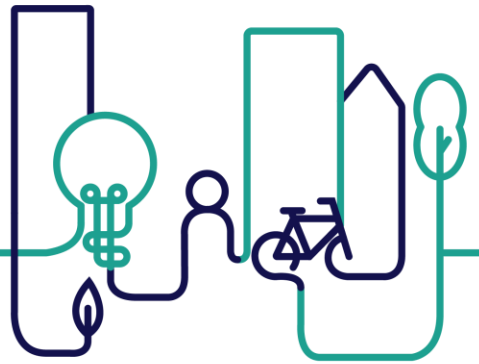


Analysis from the Case Studies

❑ Integration maturity between the two plans

Intermediate - Czech Republic, Italy

- Partial or evolving transposition of EU frameworks.
- Limited binding heat planning obligations.
- Renovation and heating policies often developed separately.
- Integration dependent on proactive municipalities.
- Limited national operational guidance.

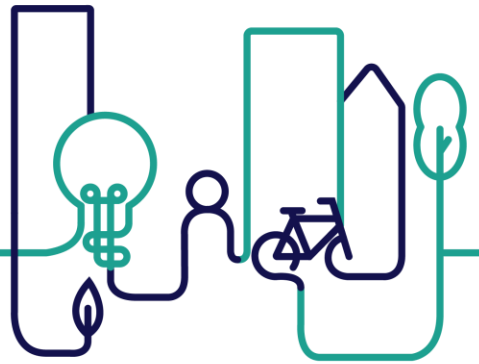


Analysis from the Case Studies

❑ Integration maturity between the two plans

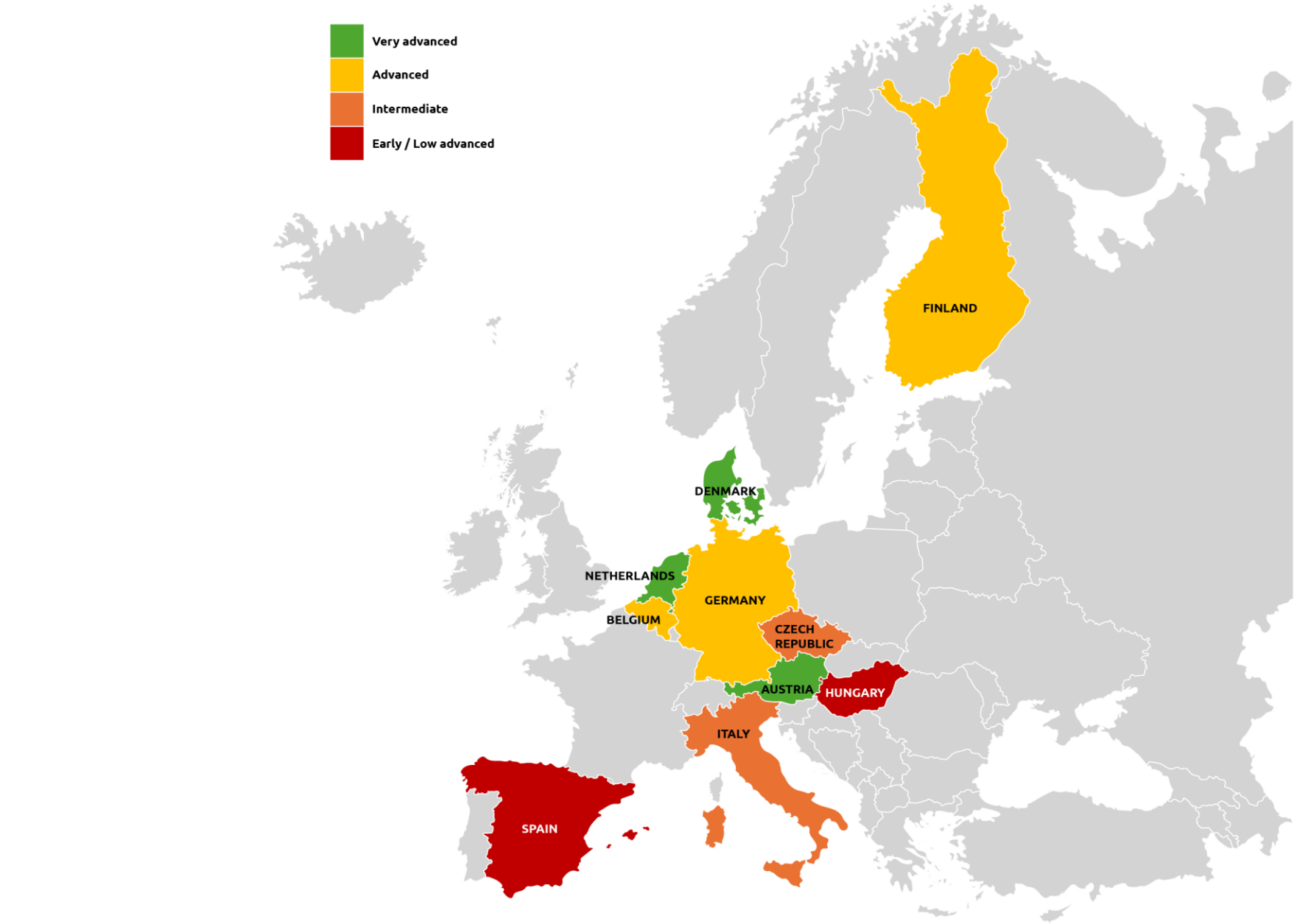
Early or Low-level integration - Spain, Hungary

- Formal EU alignment exists at regulatory level.
- Limited operational coupling between renovation and heating strategies.
- Funding schemes not consistently linked to spatial heat planning.
- Improvement loops still emerging.
- Capacity asymmetries across municipalities.



Analysis from the Case Studies

- **Integration maturity between the two plans**



Analysis from the Case Studies

❑ Observed patterns across maturity levels

- Binding heat planning requirements are a decisive accelerator.
- Funding conditionality is more powerful than strategic declarations.
- Spatial zoning mechanisms strongly enhance integration.
- Municipal technical capacity is a key differentiator.
- Improvement loops distinguish advanced systems from intermediate ones.

Analysis from the Case Studies

❑ EU policy framework alignment

Strong alignment

- National heat planning obligations.
- Dedicated national competence centres.
- Explicit guidance documents for municipalities.
- Financial schemes linked to heat transition zones.

Partial alignment

- National heat planning obligations.
- Formal compliance exists, but limited operational guidance / funding schemes not systematically conditioned.
- Dependence on proactive cities.

Emerging alignment

- Integration still consolidating.
- Coordination mechanisms dependent on interdepartmental cooperation rather than formalised joint frameworks.

Analysis from the Case Studies

❑ Key learnings from the cities

- The energy transition in buildings is primarily a **governance challenge**, not a technological one.
- Cities are responsible for implementation but often **lack the means.**
- **Data** is the foundation of planning, but **access** remains fragmented.
- **Financial viability** remains one of the largest barriers.
- **Citizen engagement** is essential for real implementation.
- Integration of plans must be driven by **real implementation.**
- There is **no one-size-fits-all** model across Europe.

Analysis from the Case Studies

❑ Integration mechanisms

1) Legislative coupling - Germany

Limitation: No defined coordination procedures -> integration declarative

2) Funding conditionality – The Netherlands

Limitation: nationally standardised -> difficulty to synchronise building upgrades with infrastructure planning

3) Spatial planning - Austria

Limitation: Smaller municipalities do not prioritise renovation funding

4) Technical tools and scenario modelling – The Netherlands

Limitation: Smaller municipalities often lack modelling tools.

5) Institutional coordination platforms – Flanders (VVSG)

Limitation observed: informal coordination -> weak integration

Analysis from the Case Studies

❑ Key bottlenecks

Institutional fragmentation	• Building renovation falls under housing ministries, • Heat planning under energy ministries, • Urban planning under regional authorities.
Misaligned planning cycles	Some LHCPs operate on shorter municipal cycles, while NBRPs are structured around national 2030–2050 trajectories.
Capacity gaps	• Lack of in-house energy modelling expertise, • Dependence on external consultants, • Limited data disaggregation.

Analysis from the Case Studies

❑ Drivers of integration

Strong national mandates	Mandatory heat planning legislation significantly accelerates integration.
Targeted Financial Instruments	Recovery and resilience funding in Spain created temporary but strong alignment between renovation and decarbonisation.
Leading Cities as Testbeds	Cities like Vienna, Barcelona, and The Hague function as experimental spaces, piloting neighbourhood-level integrated interventions, testing financing models, refining regulatory tools.

Analysis from the Case Studies

❑ Improvement Loops: how learning happens

Good examples	Weak or missing loops
✓ **Revision cycles linked to monitoring** • Germany: Municipal heat plans must be updated periodically.	➢ Monitoring data collected but not used to revise strategies.
✓ **Funding scheme adjustments** • Netherlands: Feedback from municipalities led to adaptation of subsidy structures	➢ Long delays between local feedback and national policy adaptation.
✓ **Pilot-to-policy translation** • Spain: Urban regeneration pilots inform broader national funding frameworks.	➢ Reporting obligations increasing administrative burden without improving integration.
✓ **Competence Centres** • National Energy Agencies collect local implementation feedback and refine guidelines.	

The importance of Data

Lessons from Case Studies

- **Germany:** Mandatory LHCPs, KPIs linked to heat plans, but NBRP integration still limited; lessons in top-down coordination and digital surveys.
- **Denmark & Finland:** Multi-level governance, co-creative stakeholder involvement, and integrated planning; Heat Plan roadmaps and workshops enable buy-in and data collection.
- **Belgium (Flanders):** Energy Houses help municipalities collect data, but fragmented governance and voluntary frameworks limit integration.
- **Czech Republic:** Digital monitoring of 2,500 buildings shows feasibility, but legal frameworks for data sharing lag.
- **Spain:** Cadastral-based estimates for building stock, but heating systems, renovation costs, and socio-economic vulnerability data are missing; regionalized governance limits standardization.
- **Netherlands:** NBRP and LHCP integration is hampered by competing priorities, voluntary approaches, and data standardization issues.

The importance of Data

❑ 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.

The importance of Data

❑ 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.

The importance of Data

❑ Improving Data collection and standardisation

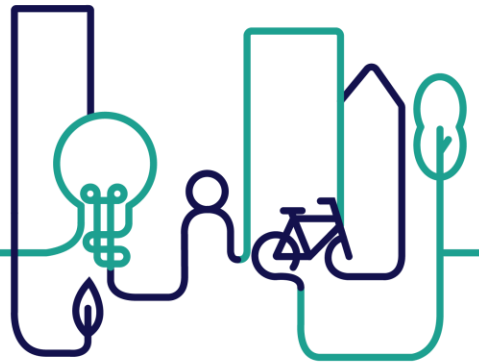
harmonised minimum dataset

interoperability between databases

clearer frameworks for data ownership and access

standardised methodologies for data collection and reporting

digital tools and building data platforms



The importance of Data

❑ Proposal for Minimum and Voluntary Data Sets

Minimum data set (core indicators):

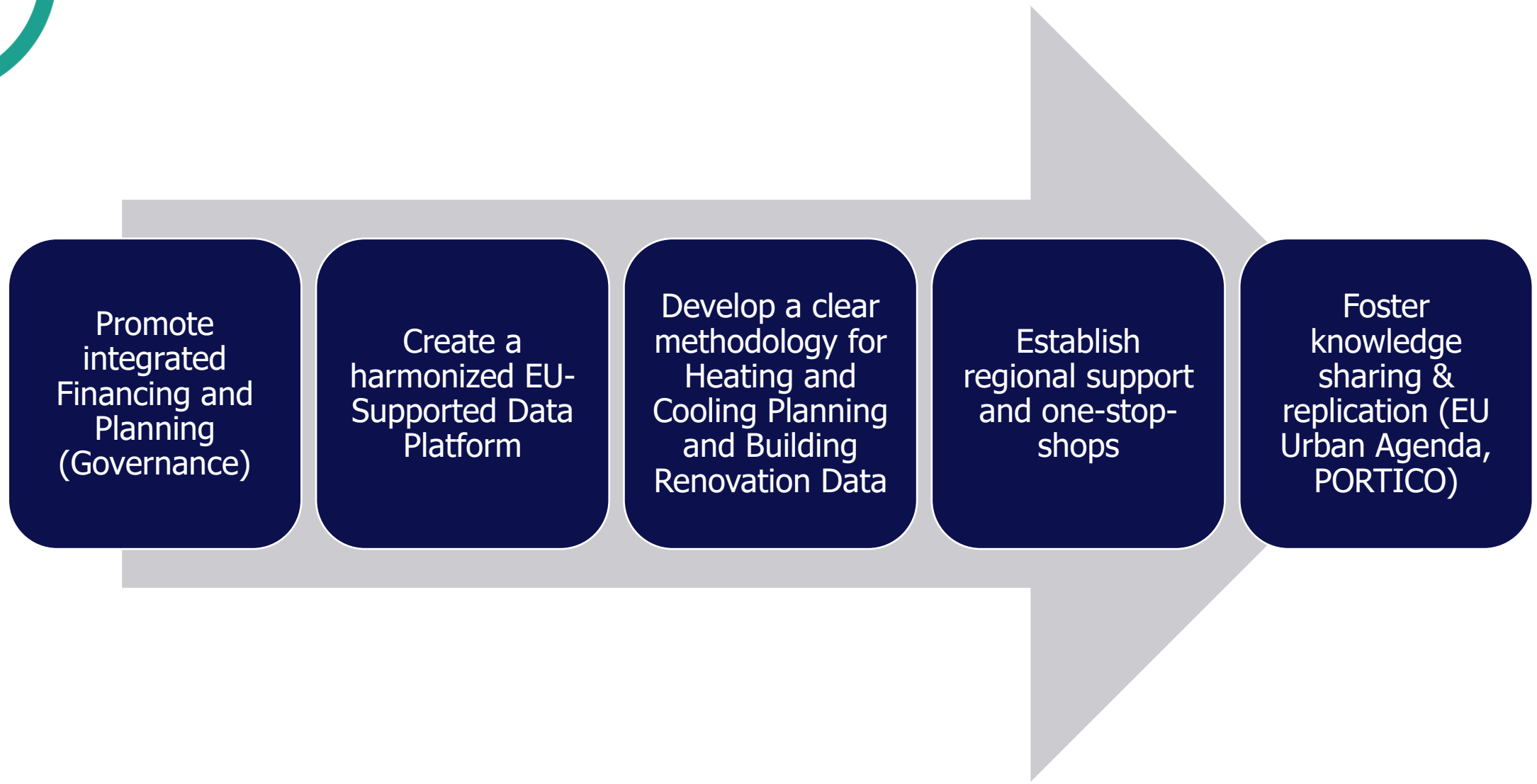
- Building age, typology, construction and renovation depth.
- Heating system type per building and connection to district heating.
- Energy demand and consumption (modeled or measured).
- EPC label (linked to actual energy performance where possible).
- Population and occupancy at building level.
- Socio-economic vulnerability (income, energy poverty).
- Infrastructure status: heating grids, energy sources, renewable potential.

Voluntary indicators (enhanced, context-dependent)

- Thermal comfort and indoor air quality improvements.
- Potential for renewable or waste heat integration.
- Job creation, skills development, and local investment linked to renovation projects.
- Participation of citizens and energy communities.
- Longitudinal tracking of renovation rates and energy efficiency gains.

Environmental – Social - Economic

Strategic steps for integration



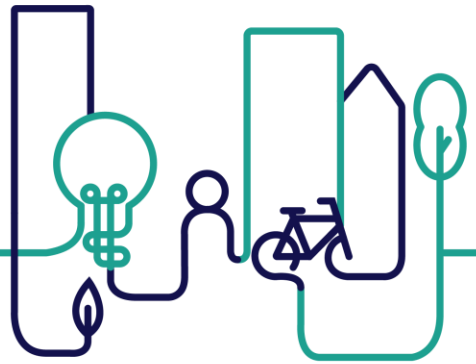
Key takeaways

- Valuable lessons emerge from all contexts
- Governance is the main driver of transformation
- Municipalities must be placed at the centre of implementation
- Data is essential, but so are mechanisms to use it
- Stakeholder engagement and behavioural change determine success
- Shared systems and common methodologies are urgently needed

World’s happiest city → EU best KPIs!

Q&A

Thank you!



Ana Contreras, EUI Expert

acontreras@ace-rta.com