



RESULTS AND LESSONS LEARNED

PUBLISHABLE REPORT
SEPTEMBER 2025



Co-funded by
the European Union



Published by the COHEAT Consortium, August 2026

LIFE21-CET-PDA-COHEAT2 - Grant Agreement no.101076568

<https://coheat.eu>

COHEAT Consortium

1. Region of Southern Denmark (RSD)
2. Danish District Heating Association (DDHA)
3. ProjectZero (PZ)
4. Nyborg Municipality (NM)
5. Middelfart Municipality (MM)
6. EC Network (ECNet)
7. PlanEnergi (PIE)

Disclaimer

Co-funded by the European Union. Views and opinions expressed are, however, those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

Table of Contents

Executive Summary	5
Project Context and Objective	5
The Project Development Unit Approach	5
Investment Mobilisation.....	5
Energy and Climate Impact.....	6
Organisational and Structural Effects.....	6
European Relevance	7
Conclusion	7
1 From Climate Ambition to Real Investments	8
1.1 The Heating Transition: From Policy to Implementation.....	8
1.2 The Investment Gap	9
1.3 Why Project Development Assistance?	9
1.4 The Regional Context	10
1.5 From Planning Tool to Governance Innovation	11
2 The Project Development Unit Model	11
2.1 From Fragmentation to Structured Facilitation	11
2.2 The Role and Function of the PDU	12
2.3 The Enabling Logic.....	13
2.4 The Three PDU Platforms.....	14
2.5 Solution Portfolio	15
2.6 Interaction with Financial Actors	16
2.7 Institutionalisation and Replicability.....	17
2.8 Strengths and Limitations of the Model	17
3 Investment Results and Performance Analysis.....	18
3.1 Scaling Private Capital Mobilisation.....	18
3.2 Distribution Across Solution Types	19
3.3 Performance by PDU Platform	21
3.4 Overachievement Explained	24
3.5 Attribution and Documentation Robustness	25

3.6	Beyond Numbers: Structural Effects	25
4	Energy and Climate Impact Assessment	26
4.1	Quantified Energy and CO ₂ Impact	26
4.2	Contribution to Fossil Fuel Phase-Out	27
4.3	Structural and Medium-Term Impact	28
5	Organisational Innovation and Structural Learning	28
5.1	Institutional Effects and Investment Acceleration	28
5.2	Beyond Investment: Institutional Effects	29
5.3	Organisational Innovation	30
5.4	Triggering Large-Scale Investment	31
5.5	Consumer Empowerment as a Strategic Lever	31
5.6	Structural Barriers Identified	32
5.7	Replicability and Transferability	32
5.8	Viability Beyond Project Funding	33
5.9	Governance Implications	34
6	Replication and European Scaling	34
6.1	From Pilot to Regional Diffusion	34
6.2	Structured Learning and Knowledge Exchange	35
6.3	Consolidation of Tools and Workflows	36
6.4	Alignment with National Frameworks	36
6.5	European Relevance	36
6.6	European Relevance in the Context of EU Legislation	37
6.7	Lessons for Scaling	38
6.8	Communication as Enabler of Exploitation	38
7	Overall Conclusions and Policy Implications	40
7.1	What COHEAT Demonstrates	40
7.2	The Central Insight	40
7.3	Structural Constraints Identified	40
7.4	Policy Implications for Scaling	41
7.5	Sustainability Beyond the Project Period	41
7.6	Final Reflection	42

Executive Summary

Project Context and Objective

The decarbonisation of residential heating is a key component of EU and national climate strategies. While strategic heat planning and technological solutions are widely available, implementation at local level remains constrained by coordination challenges, fragmented decision processes and limited facilitation capacity.

COHEAT (LIFE21-CET-PDA-COHEAT2) was implemented to address this implementation gap. The project aimed to strengthen municipal capacity to facilitate investment in green heating and energy renovation through the establishment of Project Development Units (PDUs) in the Region of Southern Denmark.

The objective was to mobilise private and collective investment by reducing non-technical barriers and improving coordination among municipalities, utilities, financial institutions and homeowners.

The Project Development Unit Approach

Three sub-regional PDUs were established, covering seven investing municipalities and engaging fifteen additional municipalities in replication-oriented activities.

The PDUs functioned as structured facilitation platforms. Their activities included:

- Alignment of municipal heat planning and infrastructure roll-out
- Structured citizen engagement
- Coordination with district heating companies and solution providers
- Dialogue with financial institutions
- Systematic documentation of enabled investments

The PDUs did not provide financial subsidies or act as infrastructure owners. Their role was to support investment readiness and reduce implementation friction.

Investment Mobilisation

The project set a target of mobilising EUR 31.9 million in green heating and energy renovation investments during the implementation period (November 2022 – October 2025).

By project completion, documented and attributable investments amounted to:

- **EUR 44.57 million**, corresponding to approximately 140% of the initial target.

Investments were realised in:

- District heating expansion

- Energy renovation of private residential buildings
- Individual heat pump installations

District heating projects constituted the largest share of mobilised investment. Energy renovation investments contributed significantly, particularly in areas targeted through structured outreach activities.

Preparatory work on local collective heating (thermonet) progressed to advanced stages but did not reach final investment decisions within the project period due to regulatory and structural constraints.

All investments reported were documented through conservative attribution methodologies consistent with LIFE Clean Energy Transition requirements.

Energy and Climate Impact

The investments enabled under COHEAT result in measurable and recurring reductions in final energy consumption and greenhouse gas emissions.

Emission reductions derive primarily from:

- Replacement of oil and gas boilers
- Expansion of district heating networks
- Uptake of electrically driven heat pumps
- Energy efficiency improvements in residential buildings

The project applied conservative assumptions in calculating energy savings and emission reductions, and no extrapolation beyond verified investments was included.

In addition to direct impacts, the project strengthened local implementation capacity, thereby improving conditions for continued investment mobilisation beyond the project period.

Organisational and Structural Effects

The establishment of PDUs contributed to:

- Improved coordination across municipal departments
- Alignment between heat planning and citizen engagement
- Structured cooperation with utilities
- Integration of financial actors into local transition processes
- Transparent documentation practices

Fifteen additional municipalities participated in thematic learning activities and gained access to tools and workflows developed under the project.

The experience indicates that structured facilitation mechanisms can complement financial support schemes and contribute to more predictable investment processes.

European Relevance

The COHEAT approach supports the implementation of recent EU legislative frameworks, including:

- Energy Efficiency Directive (EU) 2023/1791
- Energy Performance of Buildings Directive (EPBD recast 2024)
- Renewable Energy Directive (EU) 2023/2413
- Regulation (EU) 2023/955 establishing the Social Climate Fund

By strengthening local facilitation capacity, the PDU model contributes to the operationalisation of EU targets at municipal level. The approach is compatible with LIFE Clean Energy Transition objectives and may inform future deployment of capacity-building instruments under EU climate and energy programmes.

Conclusion

COHEAT demonstrates that strengthening municipal facilitation capacity can contribute to increased investment mobilisation in green heating and energy renovation.

By reducing coordination barriers and improving alignment between planning, infrastructure and citizen engagement, the project supported the mobilisation of EUR 44.57 million in verified investments.

The experience suggests that structured local implementation mechanisms can play a relevant role in accelerating the clean heating transition in line with EU and national objectives.

1 From Climate Ambition to Real Investments

The Strategic Context of COHEAT

1.1 The Heating Transition: From Policy to Implementation

The decarbonisation of residential heating is central to achieving European and national climate objectives. The European Green Deal, the Renovation Wave, and national climate frameworks all recognise that buildings — and particularly fossil-based heating systems — represent a major source of greenhouse gas emissions.

Across Denmark, municipalities have adopted ambitious climate plans aligned with national targets. Detailed heat planning has identified where district heating can be expanded, where individual heat pumps are preferable, and where alternative collective solutions may be viable. Technical solutions are available, mature, and widely tested. Financing mechanisms exist. Public awareness of climate issues has increased significantly.

Yet the pace of implementation has not matched the level of ambition.

The key obstacle is no longer technological readiness. It lies in the translation of strategic planning into thousands of individual and collective investment decisions. This structural implementation gap formed the starting point for COHEAT.



Sønderborg Combined Heat and Power Plant. The plant produces district heating and electricity through the energy recovery of non-recyclable residual waste. It is an important component of Sønderborg's collective heat supply, which COHEAT helped expand to additional households and communities, thereby supporting the replacement of individual oil and gas heating systems (Photo: Sønderborg Varme)

1.2 The Investment Gap

At project launch in November 2022, municipalities in the Region of Southern Denmark had already established strong planning frameworks. However, planning alone did not ensure that households replaced fossil heating systems or undertook energy renovation.

The gap between intention and action was shaped by several interrelated barriers:

Fragmented responsibilities across municipalities, utilities, homeowners, financial institutions, craftsmen, and national authorities.

Decision complexity for homeowners, involving long-term financial commitments, technical uncertainty, and regulatory considerations.

Coordination challenges for collective solutions requiring high participation rates and structured maturation processes.

Limited operational facilitation capacity within municipal administrations to guide projects from planning stage to final investment decision.

In practice, this meant that even socio-economically sound projects often stalled in preparatory phases. Households hesitated. Collective projects struggled to reach commitment thresholds. Dialogue between financial actors and municipal planning processes remained insufficiently structured.

The heating transition was not blocked by a lack of ambition — but by insufficient coordination and facilitation.

1.3 Why Project Development Assistance?

COHEAT was designed as a LIFE Clean Energy Transition Project Development Assistance (PDA) action. Unlike investment subsidy programmes, PDA intervention does not finance infrastructure directly. Instead, it strengthens the conditions under which investments can materialise.

The project was built on a clear hypothesis:

If non-technical barriers are reduced and coordination is structured, private capital will mobilise.

COHEAT therefore focused on institutional innovation rather than technological deployment. The objective was to develop a structured municipal facilitation model capable of:

- Translating heat planning into operational action
- Reducing uncertainty for homeowners
- Supporting collective decision-making processes
- Engaging financial institutions in a systematic way

- Tracking and documenting realised investments

This approach positioned COHEAT not as a subsidy scheme, but as a governance intervention.



Stakeholder meeting

1.4 The Regional Context

The Region of Southern Denmark provided a diverse and representative testbed. The region includes:

- Dense urban areas suitable for district heating expansion
- Medium-density municipalities with mixed solution profiles
- Rural villages beyond conventional district heating networks
- A high share of privately owned single-family homes
- Significant numbers of oil and gas boilers at project start

Seven municipalities committed to operate Project Development Units under the project, while fifteen additional municipalities participated as replication partners. This structure ensured both practical implementation and regional learning.

The territorial diversity meant that the intervention could not rely on a single technological pathway. Instead, it



required a flexible facilitation model capable of operating across varying settlement patterns and market conditions.

1.5 From Planning Tool to Governance Innovation

COHEAT did not seek to invent new heating technologies or replace national regulatory frameworks. Its ambition was structural.

The project introduced a new municipal governance mechanism: the **Project Development Unit (PDU)**. These units were conceived as integrated facilitation platforms that bridge the gap between strategy and implementation.

The PDUs were designed to function as:

- Coordinators between municipalities, utilities and financial actors
- Trusted intermediaries for homeowners
- Structured facilitators of collective heating initiatives
- Institutional mechanisms for investment tracking and attribution
- By strengthening alignment across the investment chain, the PDUs aimed to reduce friction in the transition process.

The initial quantitative target was to mobilise EUR 31.9 million in green heating and energy renovation investments. However, the broader ambition was to demonstrate that structured municipal facilitation can accelerate the clean heating transition in a scalable and replicable way.



COHEAT was initiated in response to a clear structural challenge: the heating transition had moved beyond planning, yet lacked the operational mechanisms required for large-scale implementation. The project addressed this gap by introducing structured Project Development Units at municipal level. Rather than focusing on technology deployment, COHEAT concentrated on coordination, facilitation, and institutional capacity.

2 The Project Development Unit Model

A Governance Innovation for the Heating Transition

2.1 From Fragmentation to Structured Facilitation

The starting point of COHEAT was the recognition that the heating transition is primarily a coordination challenge. While municipalities possess planning authority and strategic

direction, the realisation of investments depends on a complex interaction between multiple actors operating at different levels.

Traditional implementation models often rely on either:

- Market-driven individual decisions, or
- Utility-led infrastructure roll-out.

Both approaches have limitations. Market-driven transitions may suffer from slow uptake due to information asymmetry and perceived risk. Utility-driven expansions can be constrained by participation thresholds and coordination challenges in low-density areas.

COHEAT introduced a third approach: structured municipal facilitation through Project Development Units (PDUs).

The PDU model was designed to bridge the space between planning and execution. It does not replace market actors or utilities. Instead, it aligns them.

2.2 The Role and Function of the PDU

A Project Development Unit functions as an integrated, place-based facilitation platform embedded within municipal structures.

It does not act as:

- Investor
- Utility operator
- Technology provider
- Subsidy administrator

Instead, it operates as an enabling mechanism.

The core functions of the PDU can be summarised as follows:

Strategic Alignment

- Translating municipal heat planning into operational pathways
- Prioritising solution types based on local socio-economic criteria

Citizen Facilitation

- Structured outreach and communication
- Organisation of citizen meetings
- Targeted engagement of specific building segments

Collective Process Support

- Supporting maturation of district heating expansions
- Facilitating dialogue in villages exploring collective solutions
- Clarifying participation requirements and timelines

Financial Coordination

- Engaging banks and financial institutions
- Strengthening advisory capacity
- Aligning financing dialogue with municipal heat plans

Documentation and Attribution

- Establishing transparent methods for tracking enabled investments
- Structuring verification and conservative attribution logic

Through these functions, the PDU reduces non-technical barriers and lowers transaction costs for all actors involved.



Citizen Meetings

2.3 The Enabling Logic

The PDU model operates through a cumulative enabling effect rather than direct causality.

The intervention logic can be understood as a chain:

Planning → Facilitation → Informed Decision → Investment → Climate Impact

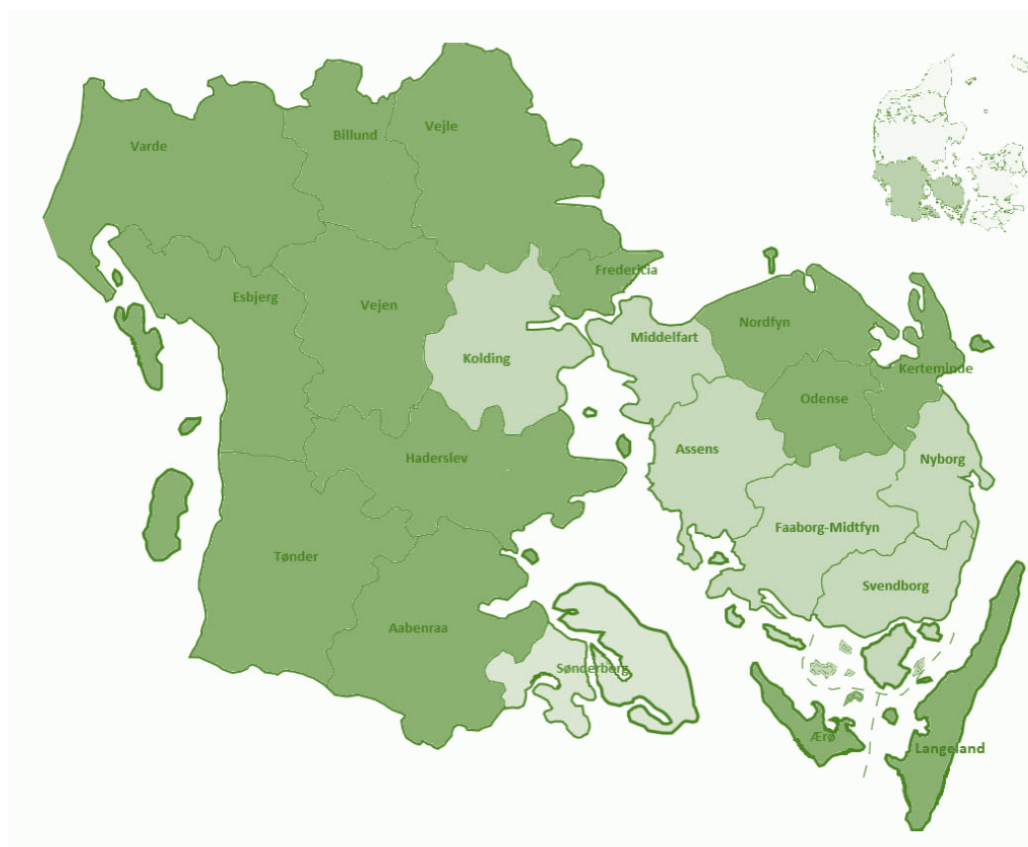
The PDU does not directly cause investments. Instead, it improves the quality and clarity of the decision environment. It reduces uncertainty, increases transparency, and strengthens coordination.

This distinction is important. As a Project Development Assistance action, COHEAT was designed to catalyse private investment rather than replace it. The effectiveness of the model

therefore depends on whether improved facilitation leads to increased investment volumes — a question addressed in later chapters.

2.4 The Three PDU Platforms

COHEAT operationalised the PDU model through three sub-regional platforms, each adapted to its territorial context.



PDU Funen

PDU Funen operated across four municipalities: Nyborg, Svendborg, Assens, and Faaborg-Midtfyn.

The platform addressed:

- Large volumes of fossil-heated single-family homes
- Expansion of district heating networks
- Preparation of thermonet solutions in villages
- Structured energy renovation campaigns



A defining feature of PDU Funen was its multi-municipal coordination structure, allowing knowledge sharing and economies of scale in facilitation efforts.

PDU Triangle Region

The Triangle Region platform covered Middelfart and Kolding municipalities.

The focus here was strongly linked to:

- District heating expansion in alignment with regional transmission systems
- Use of digital screening tools to prioritise building segments
- Structured communication strategies targeting specific neighbourhoods



The platform demonstrated how the PDU model can operate in medium-density municipalities with mixed heating profiles.

PDU Sønderborg

PDU Sønderborg was embedded within the municipality's broader ProjectZero climate masterplan.

The intervention combined:

- District heating roll-out
- Promotion of individual heat pumps
- Strong behavioural and community engagement
- Close cooperation with local stakeholders, including financial actors



The Sønderborg model illustrates how a PDU can integrate into an already advanced climate governance framework and strengthen implementation capacity.

2.5 Solution Portfolio

Across the three platforms, PDUs promoted four main solution categories:

1. District heating expansion
2. Local collective heating systems (thermonet / 5th generation district heating)
3. Individual heat pumps
4. Energy renovation of private housing

The choice of solution was not uniform. It depended on local density, infrastructure conditions, socio-economic assessments, and regulatory frameworks.

A key strength of the PDU model lies in its flexibility. Rather than prescribing a single technology, it aligns the most rational solution with local conditions.

2.6 Interaction with Financial Actors

An important dimension of the PDU model was structured engagement with financial institutions. Rather than treating financing as an external afterthought, PDUs facilitated:

- Dialogue between banks and municipal planners
- Upskilling of financial advisors regarding heat plans
- Segmentation of homeowner groups
- Alignment between climate objectives and lending practices



This integration of financial actors into the facilitation ecosystem represents a critical governance innovation, particularly relevant for scaling under future Social Climate Fund frameworks.



COHEAT Workshop with the financial sector

2.7 Institutionalisation and Replicability

The PDU model was not conceived as a temporary project structure. From the outset, the ambition was institutional embedding.

The model was designed to:

- Operate within existing municipal administrative frameworks
- Align with DK2020 and national heat planning obligations
- Provide transferable tools and workflows
- Enable replication across additional municipalities

Fifteen municipalities participated as replication partners during the project period, attending learning events and gaining access to methodologies and tools.

This diffusion process indicates that the PDU model has relevance beyond the original seven investing municipalities.

2.8 Strengths and Limitations of the Model

The experience of COHEAT highlights both the strengths and boundaries of the PDU approach.

Strengths include:

- Reduction of coordination gaps
- Increased clarity for homeowners
- Improved alignment between planning and financing
- Structured documentation of enabled investments

Limitations include:

- Dependence on national regulatory frameworks
- Need for professional operators in collective solutions
- Continued sensitivity to market and policy shifts
- Homeowner risk tolerance as a limiting factor

The PDU can reduce friction — but it cannot override structural regulatory barriers. This distinction is crucial for future policy design.



The Project Development Unit represents the central innovation of COHEAT. It reframes the heating transition as a governance and facilitation challenge rather than a purely technical deployment task.

By introducing structured municipal platforms that align planning, citizen engagement, utilities, and financial actors, the PDU model provides an operational bridge between strategy and investment.

3 Investment Results and Performance Analysis

From Facilitation to Mobilised Capital

3.1 Scaling Private Capital Mobilisation

The primary quantitative objective of COHEAT was to mobilise EUR 31.9 million in green heating and energy renovation investments over the project period (November 2022 – October 2025).

By the end of the action, investments triggered through the three Project Development Units amounted to **EUR 44.57 million against EUR 31.87 million**, based on the project's consolidated documentation and estimation methodology.

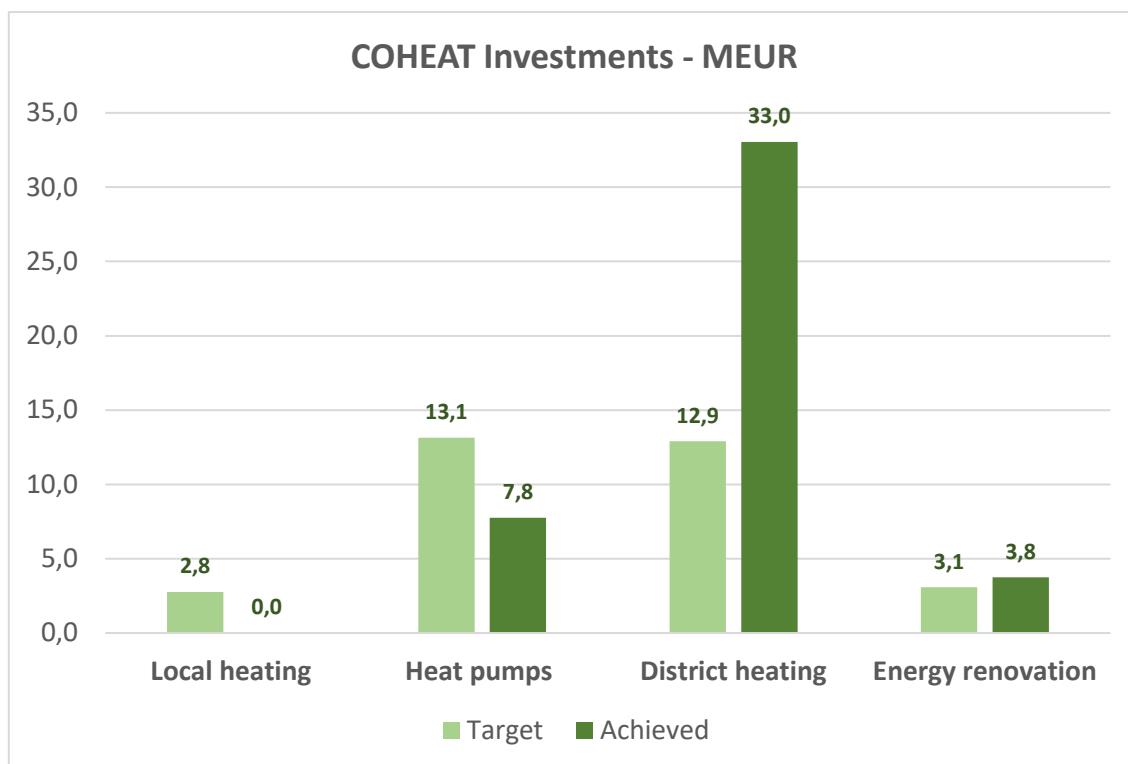
This corresponds to approximately **140% of the original target**.

Overachievement is significant not only in numerical terms, but also in structural terms. As a Project Development Assistance action, COHEAT did not provide direct capital subsidies for infrastructure deployment. The investments were undertaken by:

- Private homeowners
- District heating companies
- Collective project structures

The PDU model functioned as an enabling catalyst rather than a financing instrument.

The result confirms the project's central hypothesis: when coordination barriers are reduced and decision processes are structured, private capital mobilises.



3.2 Distribution Across Solution Types

COHEAT promoted four categories of investment solutions:

1. District heating expansion
2. Local collective heating (thermonet / 5th generation systems)
3. Individual heat pumps
4. Energy renovation of private housing

The realised investment distribution reflects both local adaptation and external policy dynamics.

District Heating

District heating emerged as the strongest performing investment category.



Expansion projects progressed to final investment decisions in several municipalities, supported by:

- Structured citizen engagement
- Municipal guarantees

- Close coordination between utilities and PDUs
- Alignment with national policy prioritisation

In dense and medium-density areas, district heating provided a clear and economically robust pathway for fossil fuel phase-out. The PDU model accelerated decision processes by ensuring early information, coordinated outreach, and alignment of planning and communication timelines.

Energy Renovation

Energy renovation investments also exceeded expectations. Targeted campaigns, structured communication strategies, and collaboration with local stakeholders reduced uncertainty among homeowners.

The combination of:

- Data-driven identification of low-performing buildings
- Personalised outreach
- Citizen meetings
- Integration of financial dialogue

proved effective in triggering household-level decisions.



Energy renovation investments demonstrate that behavioral and informational barriers can be reduced through structured facilitation — even in the absence of direct subsidy control by the project itself.

Individual Heat Pumps

Individual heat pump investments progressed, though more moderately than initially anticipated. The explanation lies partly in external policy dynamics.



During the project period, national and municipal prioritisation strongly favoured district heating expansion in areas deemed socio-economically suitable. This influenced both communication strategies and homeowner expectations. In areas scheduled for district heating roll-out, households often postponed individual investments.

Where district heating was not feasible, heat pumps remained a rational and promoted solution. However, the broader policy environment shaped uptake patterns.

Local Collective Heating

Local collective solutions, including thermonet systems, reached advanced preparatory stages in several villages. Technical feasibility studies were conducted, citizen engagement processes were initiated, and organisational models were explored.



Despite this progress, no thermonet projects reached final investment decision within the project timeframe.

The decisive barriers included:

- Regulatory uncertainty regarding ownership and operation models
- Limited homeowner risk acceptance at the point of financial commitment
- Absence of professional operators willing to assume long-term responsibility
- Financing complexity in small-scale collective systems

The experience underscores a key lesson: facilitation can mature projects, but final investment decisions require stable regulatory and institutional conditions.

The thermonet case therefore represents not a failure of facilitation, but a demonstration of structural constraints beyond the control of municipal-level intervention.

3.3 Performance by PDU Platform

The overall mobilisation of EUR 44.57 million was achieved through three distinct territorial platforms. While operating under a shared governance model, each PDU demonstrated differentiated performance patterns shaped by local conditions, infrastructure readiness, and regulatory dynamics.

The differences in target achievement do not reflect differences in implementation quality. Rather, they illustrate how the common PDU model adapted to varying territorial conditions, investment opportunities, and local implementation contexts across Southern Denmark.

The following profiles summarise the contribution and distinctive performance characteristics of each platform.

PDU Funen

Across the four main investment categories, the total investment triggered amounted to EUR **19.98 million**, corresponding to approximately **121% of the target (EUR 16.51 million)**.

PDU Funen, covering Nyborg, Svendborg, Assens and Faaborg-Midtfyn municipalities, contributed a substantial share of the overall investment mobilisation. The platform operated

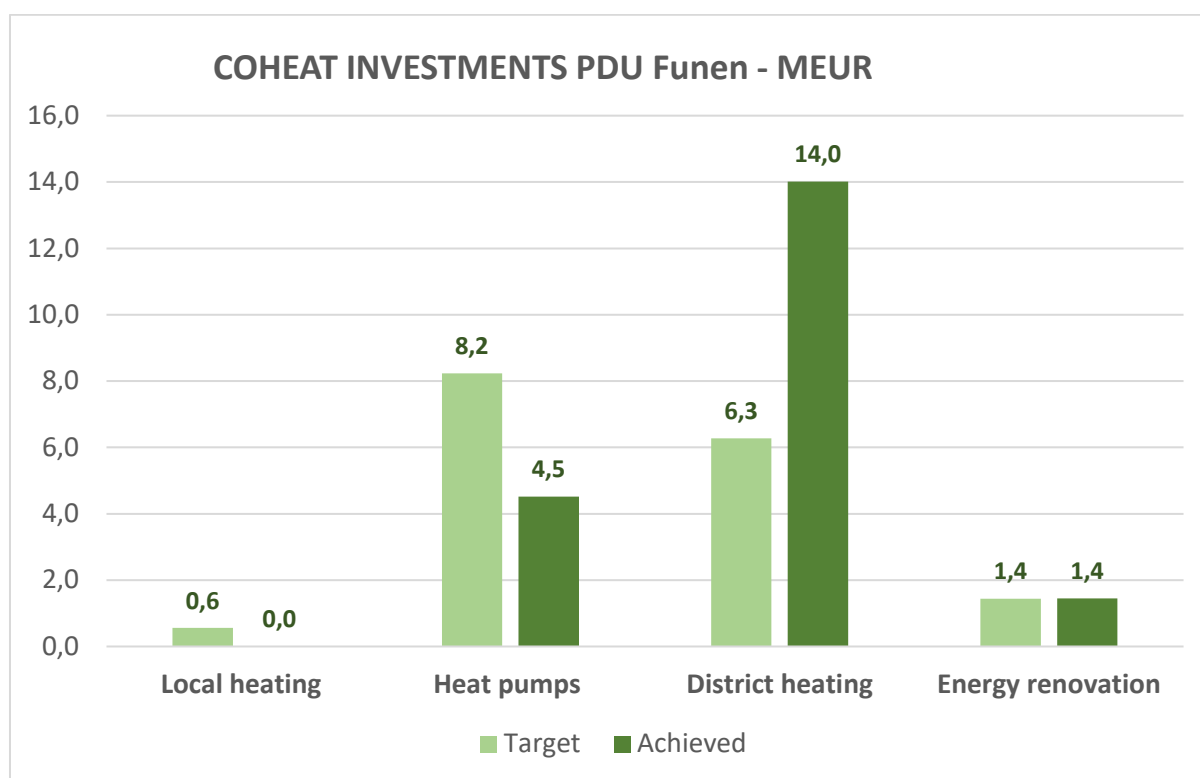
across a territorially diverse area characterised by both district heating expansion zones and rural settlements with fossil-based heating systems.

District heating constituted the dominant investment category, supported by structured citizen engagement and coordinated communication strategies across municipalities. In parallel, targeted energy renovation campaigns triggered household-level investment decisions, particularly in buildings with low energy performance ratings.

Preparatory work for local collective heating (thermonet) advanced to technical maturity but did not reach final investment decision within the project period, reflecting structural regulatory constraints rather than facilitation gaps.

PDU Funen demonstrated the value of cross-municipal coordination in scaling facilitation capacity. By aligning outreach, screening, and documentation processes across four municipalities, the platform reduced fragmentation and accelerated district heating conversion in priority areas.

Key Contribution: Large-scale mobilisation driven by coordinated district heating expansion combined with targeted renovation activation.



PDU Triangle Region

Across the four main investment categories, the total investment triggered amounted to **EUR 13.50 million** corresponding to approximately **139% of the target (EUR 9.69 million)**.

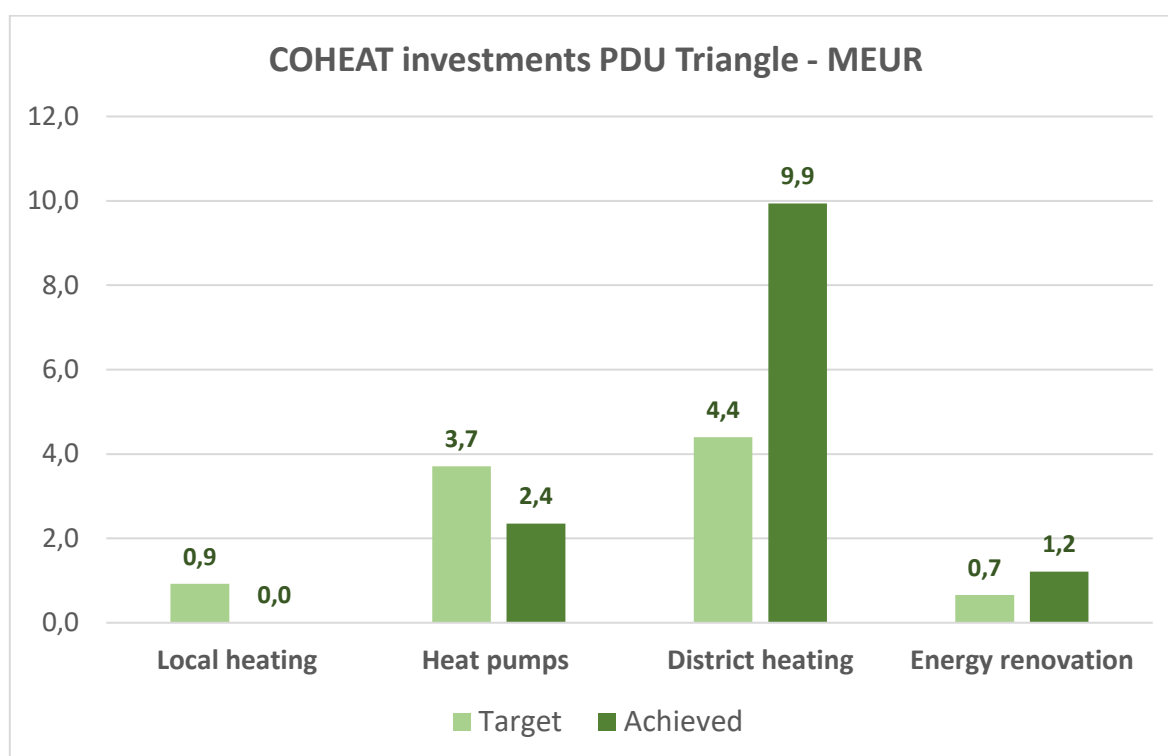
Operating in Middelfart and Kolding municipalities, PDU Triangle Region generated investment primarily through structured district heating expansion aligned with regional transmission infrastructure.

The platform applied data-driven screening methodologies to prioritise neighbourhoods with high conversion potential. Citizen engagement activities were synchronised with infrastructure roll-out phases, improving predictability and reducing homeowner hesitation.

Energy renovation investments were present but secondary to district heating mobilisation. The regulatory environment during the project period further reinforced prioritisation of collective heating solutions in socio-economically viable zones.

PDU Triangle Region illustrated the effectiveness of sequenced implementation and timing alignment. By linking communication efforts directly to infrastructure readiness, the platform increased conversion efficiency and shortened decision cycles.

Key Contribution: High-impact district heating mobilisation through precise targeting and coordination.



PDU Sønderborg

Across the four main investment categories, the total investment triggered amounted to **EUR 11.09 million** corresponding to approximately **195% of the target (EUR 5.68 million)**.

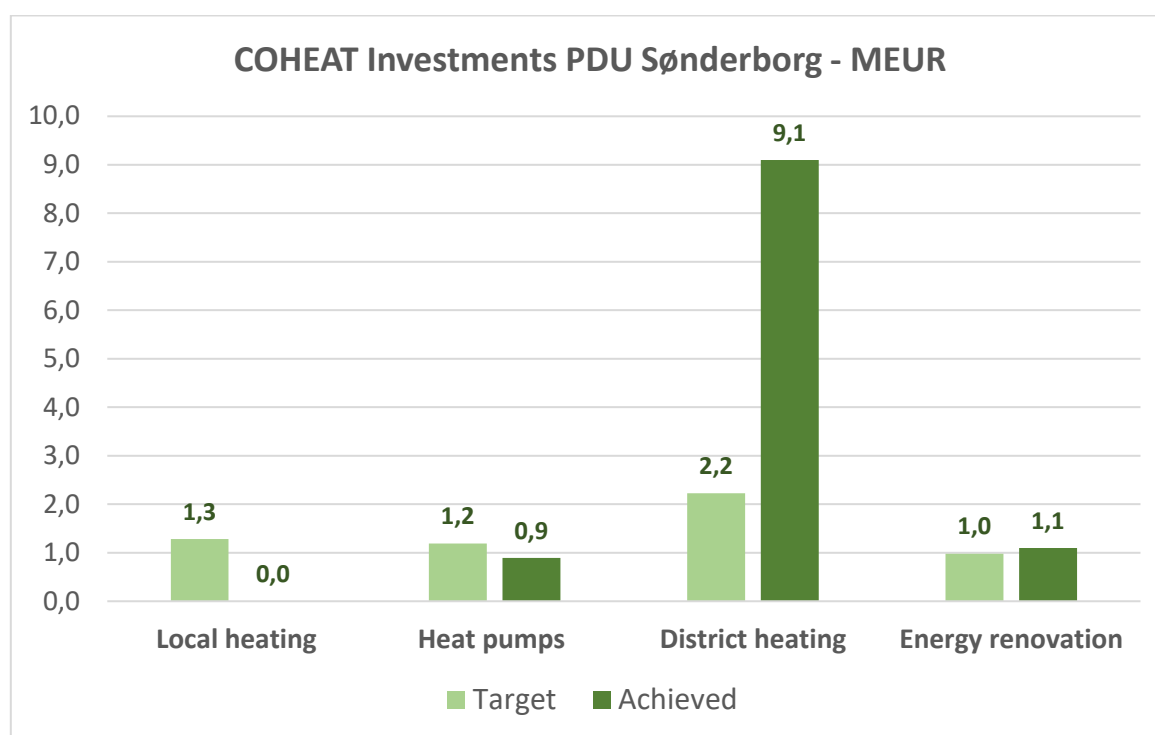
PDU Sønderborg operated within an established climate governance framework and contributed investment across multiple solution categories.

District heating expansion represented a significant component, complemented by measurable uptake of individual heat pumps in non-district heating areas. Energy renovation activities were integrated into the broader heating transition narrative and supported through stakeholder engagement and financial dialogue.

The diversified solution portfolio reflects both territorial conditions and the maturity of the municipality's long-standing climate strategy.

Sønderborg demonstrated the strength of deep institutional integration. The PDU functioned as an operational extension of existing climate governance structures, reinforcing implementation continuity and stakeholder trust.

Key Contribution: Balanced investment mobilisation across collective and individual solutions, supported by strong institutional embedding.



3.4 Overachievement Explained

The overall investment overperformance was primarily driven by:

- Strong uptake of district heating projects
- Successful mobilisation of energy renovation investments

These categories more than compensated for the absence of realised thermonet investments and the moderate progression of heat pumps.

The results illustrate an important characteristic of the PDU model: adaptability. Rather than rigidly pursuing equal volumes across all solution types, PDUs aligned their efforts with evolving regulatory signals, feasibility assessments, and citizen preferences.

This adaptive governance approach proved decisive under volatile policy and market conditions.

3.5 Attribution and Documentation Robustness

As a PDA action, COHEAT required a transparent and conservative approach to attribution. Investments were not automatically attributed to the project merely because they occurred within participating municipalities.

Instead, documentation relied on structured evidence, including:

- Contracts and invoices for collective infrastructure
- Municipal verification statements
- Declarations of Honour from homeowners
- Registry-based cross-checking
- Conservative causality assessments

This methodology ensured that reported investments reflect credible enabling contributions rather than coincidental developments.

The conservative approach strengthens the reliability of the results and reinforces the integrity of the PDU model as a measurable governance intervention.

3.6 Beyond Numbers: Structural Effects

While the headline figure of EUR 44.57 million is central, the structural effects extend beyond investment volume.

The PDU platforms contributed to:

- Improved alignment between heat planning and implementation
- Increased homeowner awareness and readiness to act
- Strengthened cooperation between municipalities and utilities
- Institutionalised dialogue with financial actors
- Development of transferable workflows and tools

These structural effects form the foundation for continued investment mobilisation beyond the project period.

COHEAT demonstrates that structured municipal facilitation can mobilise substantial private investment without direct capital subsidy. The project exceeded its quantitative target by 40%, primarily driven by district heating expansion and energy renovation uptake.

At the same time, the experience highlights the importance of stable regulatory frameworks for emerging collective solutions such as thermonet systems.

The results confirm that the heating transition is not solely dependent on technology deployment, but on effective coordination and governance structures capable of reducing decision friction.

4 Energy and Climate Impact Assessment

Translating Investment into Measurable Climate Outcomes

4.1 Quantified Energy and CO₂ Impact

The resulting annual impact from the triggered investments represents recurring primary energy savings, reduced fossil-fuel dependency and greenhouse-gas emission reductions.

Energy savings arise from:

- Replacement of oil and gas boilers with district heating or heat pumps
- Improved building envelopes through insulation and window upgrades
- More efficient heat distribution systems

CO₂ emission reductions were calculated by comparing baseline fossil heating systems with the emission profiles of the new solutions. District heating emissions were assessed using current and projected fuel mixes, while heat pump performance was calculated based on national electricity emission factors.

The assessment applies conservative assumptions and excludes extrapolation beyond documented investments. Only verified and attributable projects are included.

The resulting annual impact represents recurring reductions in:

- Primary energy savings
- Reduced fossil fuel dependency

- Greenhouse gas emission reductions

These reductions contribute directly to municipal climate targets and national decarbonisation pathways.

Primary energy savings	28,297 against 37,477 MWh/year
Greenhouse gas emission reductions	5,544 against 6,742 tonnes/year



Showcasing district heating solutions

4.2 Contribution to Fossil Fuel Phase-Out

A central objective of both Danish and European climate policy is the phase-out of fossil heating in residential buildings. The COHEAT-enabled investments accelerate this transition through:

1. Conversion from gas to district heating in designated expansion zones
2. Replacement of oil boilers in rural areas
3. Transition to electrically driven heat pumps
4. Integration of heating replacement with energy renovation measures

Beyond emission reductions, these investments strengthen energy security and reduce household exposure to fossil fuel price volatility.



The coordinated facilitation provided by the PDUs ensured that infrastructure roll-out, citizen engagement, and investment decisions were aligned, thereby accelerating conversion in priority areas.

4.3 Structural and Medium-Term Impact

The quantified impact reflects investments realised within the project period. However, the structural contribution of COHEAT extends beyond immediate results.

By strengthening municipal facilitation capacity, institutionalising coordination mechanisms, and integrating financial actors into the transition process, the PDU model improves the conditions for continued investment mobilisation.

The climate impact of COHEAT therefore has two dimensions:

1. Direct annual reductions resulting from verified investments.
2. Structural enabling effects supporting additional future investments.

This distinction is central to understanding the role of Project Development Assistance actions: their primary function is to reduce implementation friction and catalyse private capital, thereby accelerating systemic decarbonisation.



The energy and climate impact assessment confirms that the investments enabled under COHEAT deliver measurable and recurring reductions in energy consumption and greenhouse gas emissions.

More importantly, the project demonstrates that structured municipal facilitation can function as a climate instrument in its own right. By aligning planning, infrastructure, finance and citizen engagement, the PDU model accelerates fossil fuel phase-out and strengthens the implementation capacity required for long-term decarbonisation.

5 Organisational Innovation and Structural Learning

Strengthening Municipal Capacity for the Heating Transition

5.1 Institutional Effects and Investment Acceleration

While the mobilisation of EUR 44.57 million represents a tangible outcome of COHEAT, the project's structural impact extends beyond financial volume. The establishment of Project Development Units strengthened municipal implementation capacity and accelerated investment processes through institutional alignment.

The qualitative evaluation shows that the PDU model contributed to:

- More systematic coordination across municipal departments
- Stronger alignment between heat planning and citizen engagement
- Improved cooperation between municipalities and utilities
- Structured integration of financial actors
- Transparent documentation and attribution practices

These institutional effects reduced fragmentation in the heating transition process and created a more predictable decision environment for homeowners and infrastructure providers.

Importantly, investment acceleration did not result from direct financial intervention by the project. Instead, mobilisation occurred through cumulative enabling mechanisms, including:

- Reduction of information asymmetry
- Improved sequencing of communication and infrastructure roll-out
- Increased transparency regarding long-term heating pathways
- Strengthened trust between municipalities, utilities, and citizens
- Enhanced clarity in financing dialogue

By lowering transaction costs and decision uncertainty, the PDUs shortened maturation periods for district heating expansion and supported household-level investment decisions.

The experience demonstrates that facilitation structures embedded within municipal governance can function as catalytic mechanisms for private capital mobilisation. Institutional capacity-building therefore emerges as a climate policy instrument in its own right.

5.2 Beyond Investment: Institutional Effects

While the mobilisation of EUR 44.57 million in green heating and renovation investments represents a significant achievement, the structural impact of COHEAT extends beyond financial figures.

The project introduced and tested a new municipal implementation mechanism — the Project Development Unit — which strengthened local capacity to operationalise climate targets.

The qualitative evaluation indicates that the PDU model contributed to:

- More systematic coordination between municipal departments
- Stronger alignment between heat planning and citizen engagement
- Improved dialogue with district heating companies
- Institutionalised cooperation with financial actors

- Structured investment tracking and verification

These institutional effects represent a shift from project-based action toward embedded governance practice.

5.3 Organisational Innovation

The PDU model constitutes a governance innovation in three distinct ways.

1 ► Integration Across Administrative Silos

Traditionally, municipal climate planning, energy advisory services, and infrastructure coordination operate in separate administrative domains. COHEAT encouraged integrated workflows that aligned:

- Strategic heat planning
- Communication strategies
- Financial dialogue
- Monitoring and documentation

This integration reduced internal fragmentation and improved implementation coherence.

2 ► Structured Citizen Facilitation

Rather than relying on passive information dissemination, PDUs applied targeted engagement strategies based on building data, neighbourhood segmentation, and planned infrastructure timelines.

This structured approach increased clarity for homeowners and improved the timing of decision processes. It moved municipal engagement from reactive advisory to proactive facilitation.

3 ► Formalised Cooperation with Financial Institutions

COHEAT demonstrated that financial actors can be integrated into municipal transition governance. Through dialogue and knowledge exchange, banks improved their understanding of:

- Municipal heat plans
- Regulatory developments
- Technology pathways
- Risk profiles of heating investments

This alignment supports long-term scaling of green finance at local level.

5.4 Triggering Large-Scale Investment

The experience of COHEAT confirms that the PDU model contributes to investment mobilisation through cumulative enabling rather than direct intervention.

The mechanisms observed include:

- Reduction of information asymmetry
- Increased predictability of transition pathways
- Strengthened trust between actors
- Improved timing of outreach relative to infrastructure roll-out
- Lowered perceived risk among homeowners

The results suggest that structured facilitation can accelerate investment cycles and reduce the maturation time of collective projects.

5.5 Consumer Empowerment as a Strategic Lever

Homeowners are central actors in the heating transition. However, they often face technical, financial, and regulatory complexity.

COHEAT's structured engagement model contributed to:

- Improved clarity regarding solution options
- Increased understanding of long-term cost implications
- Better alignment between heating replacement and renovation timing
- Enhanced confidence in collective decision processes

By positioning municipalities as trusted facilitators rather than prescriptive authorities, the PDUs supported informed homeowner decision-making without distorting market dynamics.



Citizen Meeting

5.6 Structural Barriers Identified

The project also generated valuable learning regarding structural constraints.

Thermonet projects illustrate that:

- Regulatory clarity is essential for collective ownership models
- Long-term operational responsibility must be institutionally secured
- Financing small-scale collective systems remains complex
- Homeowner risk tolerance is a decisive factor at commitment stage

Similarly, shifts in national policy prioritisation influenced the relative uptake of solution types, particularly between district heating and individual heat pumps.

These findings underline a key conclusion: facilitation can reduce friction, but stable regulatory frameworks are necessary to enable final investment decisions.

5.7 Replicability and Transferability

The PDU model has demonstrated adaptability across diverse municipal contexts.

During the project period:

- Fifteen additional municipalities engaged in replication-oriented activities
- Four thematic learning events facilitated structured knowledge exchange
- Tools and workflows were consolidated in a transferable format

The model does not depend on a specific territorial condition or single technology pathway. Instead, it provides a flexible governance structure adaptable to local characteristics.

Its replicability lies in:

- Institutional embedding within municipal administration
- Alignment with existing heat planning obligations
- Compatibility with national and EU funding frameworks



Citizen Meeting

5.8 Viability Beyond Project Funding

A central question for any PDA action concerns sustainability beyond project funding.

In the case of COHEAT, several factors support continued viability:

- PDUs are embedded in existing municipal structures
- Workflows have been internalised
- Stakeholder relationships are established
- Financial dialogue mechanisms remain active
- Tools and documentation methods are operational

While dedicated funding strengthens capacity, the core facilitation approach can be maintained within regular administrative functions.

This suggests that the PDU model is not dependent on continued project financing, but rather on institutional prioritisation.

5.9 Governance Implications

COHEAT reframes the heating transition as a governance issue. The project demonstrates that:

- Institutional capacity-building is a climate instrument
- Structured coordination reduces implementation delays
- Municipal facilitation can unlock private capital
- Financial actors can be integrated into local transition governance

These insights have implications for national and EU-level climate policy design, particularly in the context of scaling clean heating transitions across Member States.



COHEAT's qualitative evaluation confirms that the Project Development Unit model strengthened municipal capacity and improved coordination mechanisms across the heating transition ecosystem.

While quantitative results demonstrate mobilisation success, the organisational learning and institutional innovation provide the foundation for long-term structural impact.

6 Replication and European Scaling

From Regional Implementation to Transferable Model

6.1 From Pilot to Regional Diffusion

COHEAT was implemented through seven investing municipalities. However, the ambition from the outset was broader: to create a model capable of replication across the entire Region of Southern Denmark and beyond.

Fifteen additional municipalities participated as replication partners during the project period. These municipalities did not operate full PDUs but engaged in structured learning processes, attended thematic events, and gained access to tools and methodologies developed under the project.

This two-tier structure — investing municipalities and replication municipalities — created an environment for controlled testing and parallel diffusion. It ensured that the PDU model was

not confined to isolated pilot cases, but exposed to diverse administrative contexts within the region.

Replication therefore began during implementation, not after project closure.

6.2 Structured Learning and Knowledge Exchange

Four thematic learning events were organised during the project period, bringing together municipal planners, utilities, financial actors, and technical experts. In total, more than one hundred participants attended these events, including representatives from replication municipalities.

The learning events served multiple functions:

- Exchange of practical experience between PDUs
- Discussion of regulatory developments
- Presentation of tools and screening methodologies
- Reflection on barriers and enabling factors
- Exposure of replication municipalities to operational models

Importantly, these events were not promotional in character. They functioned as structured peer-learning arenas, where both successes and limitations were openly discussed.

This approach strengthened the credibility of the PDU model and supported informed adaptation rather than simple replication.



Exchange Workshop with the Danish District Heating Sector

6.3 Consolidation of Tools and Workflows

A key component of the replication strategy was the consolidation of operational tools.

COHEAT developed and refined:

- Structured citizen engagement formats
- Screening methodologies for building stock
- Documentation and attribution systems
- Templates for cooperation with financial actors
- Logbook and monitoring practices

These elements were assembled into a transferable toolbox, enabling other municipalities to adopt or adapt specific components of the PDU approach.

The value of the toolbox lies not in technical complexity, but in organisational clarity. It provides practical guidance on how to structure facilitation rather than prescribing specific technologies.

6.4 Alignment with National Frameworks

COHEAT operated in alignment with existing national initiatives, including municipal DK2020 climate plans and national heat planning obligations.

This alignment is crucial for replication. The PDU model does not require new regulatory frameworks to function. Instead, it strengthens the operational capacity required to implement existing policy commitments.

By embedding facilitation structures within established planning obligations, the model avoids parallel governance systems and supports institutional coherence.

6.5 European Relevance

While COHEAT is regionally anchored, its core challenge — translating heat planning into investment — is shared across Europe.

Many Member States face similar structural barriers:

- Ambitious climate targets
- Technically feasible solutions
- Fragmented implementation structures
- Slow uptake in residential heating transitions

The PDU model offers a replicable governance mechanism addressing these barriers.

Its European relevance lies in several characteristics:

- Compatibility with LIFE Clean Energy Transition objectives
- Alignment with Renovation Wave priorities
- Potential integration into Social Climate Fund deployment
- Scalability within regional and municipal governance frameworks
- Non-distortion of market mechanisms

The model demonstrates that local facilitation capacity is a critical component of the clean heating transition.

6.6 European Relevance in the Context of EU Legislation

The relevance of the COHEAT model extends beyond programme alignment. It responds directly to implementation challenges embedded in recent European energy and climate legislation.

The Project Development Unit model supports the operationalisation of key provisions under:

Energy Efficiency Directive (EU) 2023/1791 (EED recast): The strengthened energy savings obligations and increased renovation targets require systematic activation of private building owners. The PDU model provides a structured local mechanism for translating national energy efficiency targets into household-level investment decisions.

Energy Performance of Buildings Directive (EPBD recast 2024): The introduction of national renovation pathways, minimum energy performance standards, and enhanced renovation requirements increases the need for local facilitation structures capable of guiding homeowners through complex regulatory transitions. The PDU model supports implementation by aligning municipal planning, citizen outreach and financial dialogue.

Renewable Energy Directive (EU) 2023/2413 (RED III): The accelerated deployment of renewable heating and cooling technologies depends on reducing non-technical barriers. By coordinating district heating expansion, heat pump uptake and collective solutions, the PDU model contributes to renewable heating integration at territorial level.

Regulation (EU) 2023/955 establishing the Social Climate Fund (SCF): The SCF emphasises targeted support for vulnerable households affected by the extension of emissions trading to buildings (ETS2). The PDU approach demonstrates how local facilitation capacity can complement financial support schemes, ensuring that subsidies translate into realised investments.

Beyond alignment with individual directives, the model contributes to broader objectives under the European Green Deal and REPowerEU by accelerating fossil fuel phase-out and strengthening energy security at local level.

Its European relevance therefore lies in five structural characteristics:

- Operationalisation of binding EU targets at municipal level
- Compatibility with LIFE Clean Energy Transition objectives
- Integration potential within Social Climate Fund deployment frameworks
- Scalability across regional and local governance systems
- Preservation of market-based investment dynamics through facilitation rather than subsidy distortion

The experience of COHEAT demonstrates that legislative ambition alone is insufficient without local implementation capacity. Structured municipal facilitation emerges as a critical enabling layer between European targets and realised decarbonisation.

6.7 Lessons for Scaling

The experience of COHEAT suggests several considerations for scaling at national or European level:

1. Facilitation structures must be embedded within municipal administration rather than externally imposed.
2. Stable regulatory frameworks are necessary for emerging collective solutions.
3. Financial actors should be systematically integrated into local transition governance.
4. Conservative documentation strengthens credibility and policy relevance.
5. Replication should prioritise adaptation over uniform duplication.

Scaling the PDU model therefore requires institutional commitment as much as financial support.

6.8 Communication as Enabler of Exploitation

Dissemination under COHEAT was designed to support exploitation rather than publicity.

Communication activities included:

- Structured newsletters and policy briefs
- Case study publications
- Learning event summaries
- Engagement with national and European networks

The emphasis was on transferring knowledge and practical experience rather than brand visibility. In local citizen outreach, the COHEAT brand was deliberately downplayed to maintain municipal trust and clarity of communication.

This distinction between B2B strategic dissemination and local B2C facilitation reflects the dual character of the project.

COHEAT has moved beyond pilot experimentation toward institutional diffusion. The PDU model has demonstrated adaptability across diverse municipal contexts and alignment with national planning frameworks.

Its European relevance lies not in technological novelty, but in governance innovation. By strengthening local facilitation capacity, the model addresses a structural bottleneck common to many heating transitions.



COHEAT Learning Event

7 Overall Conclusions and Policy Implications

A Governance Blueprint for Accelerating the Heating Transition

7.1 What COHEAT Demonstrates

COHEAT addressed a structural implementation gap in the heating transition: the disconnect between strategic heat planning and realised investment.

The project mobilised EUR 44.57 million, exceeding its target by approximately 40%. More importantly, it validated a structured municipal facilitation model capable of accelerating investment without direct capital subsidy.

The Project Development Unit (PDU) model proved effective in:

- Translating heat plans into operational pathways
- Reducing decision uncertainty among homeowners
- Aligning infrastructure roll-out and citizen engagement
- Integrating financial actors into local transition governance
- Establishing transparent documentation practices

The results confirm that institutional capacity-building can catalyse private capital mobilisation at scale.

7.2 The Central Insight

The heating transition is not constrained by technological availability. It is constrained by coordination and decision friction.

Heat planning provides direction. Infrastructure provides technical feasibility. But without structured facilitation, implementation remains slow and fragmented.

COHEAT demonstrates that reducing transaction costs, aligning actors, and strengthening local governance capacity can significantly accelerate investment decisions.

Municipal facilitation should therefore be recognised as a climate instrument — not merely an administrative support function.

7.3 Structural Constraints Identified

The project also clarified systemic barriers that require policy attention.

The limited realisation of thermonet projects highlights the importance of:

- Clear regulatory frameworks for collective ownership models

- Defined long-term operational responsibility
- Financing structures suited to small-scale collective systems

Similarly, shifting national prioritisation between district heating and individual solutions influenced local investment patterns.

These findings underline that facilitation models depend on stable and coherent regulatory environments.

7.4 Policy Implications for Scaling

The experience of COHEAT suggests five key directions for national and European scaling:

1. Institutionalise Municipal Facilitation Platforms. Structured local implementation capacity should be embedded within municipal administration.
2. Align Financial Systems with Heat Planning. Financial institutions must be systematically integrated into transition governance.
3. Provide Regulatory Clarity for Emerging Collective Solutions. Stable frameworks are essential for investment confidence.
4. Support Capacity Building alongside Subsidy Schemes. Financial incentives are more effective when paired with implementation structures.
5. Maintain Conservative and Transparent Attribution. Credible documentation strengthens policy legitimacy and replicability.

These lessons are directly relevant for future LIFE Clean Energy Transition actions and the deployment of the Social Climate Fund.

7.5 Sustainability Beyond the Project Period

The durability of the PDU model lies in its institutional embedding. Workflows, stakeholder relationships and coordination mechanisms established under COHEAT remain operational beyond project funding.

The project has therefore contributed not only to short-term investment mobilisation but to long-term implementation capacity.

7.6 Final Reflection

COHEAT confirms that accelerating the heating transition requires governance innovation alongside technological deployment.

By structuring facilitation at municipal level, the project reduced implementation friction and unlocked private capital in support of fossil fuel phase-out.

The Project Development Unit model provides a transferable governance blueprint for regions and Member States seeking to operationalise clean heating transitions at scale.