

**Innovation and Government arrangements
of AE systems; a multi case analysis of
WaterWarmth pilots**

This report focuses on what we can learn from the Interreg North Sea WaterWarmth pilot projects. These pilots test how aqua thermal energy (AE) systems can be used and expanded in real-world situations. The goal is to understand how innovation and governance (decision-making and rules) help these projects succeed and grow.

To do this, we used a mixed-methods approach — meaning we combined different types of data, such as surveys, interviews, and workshops. This work also builds on earlier research from WP6 (see Deliverable 6.1), where different theories and models were used to study how heating systems like AE are governed and developed.

In this report, we use three key approaches from that earlier work:

1. Multi-Level Perspective (MLP) – looks at how new systems grow while interacting with existing ones.
2. Strategic Niche Management (SNM) – focuses on how small-scale, early innovations are supported and improved.
3. Governance Arrangements (GA) – looks at the role of governments, policies, rules, and authority.

Because this report focuses on local, small-scale AE developments, we especially look at ideas from SNM, such as how expectations are shaped, how networks are built, and how people and groups learn during the process.

These pilots happen in existing social and policy environments, which means they are affected by current heating systems (called "regimes"). These regimes often make it harder for AE systems to grow. We use the MLP to explore how these systems resist change. We also look at the role of governance — especially how regulations, permits, and subsidies affect the pilots.



How the research was done

We studied nine pilot projects using a multi-case study approach. Here's how the data was collected:

- In April 2024, the pilots answered an online survey.
- In May 2024, a workshop was held in Caen, France.
- During autumn 2024, we did in-depth interviews with key people from the projects.

Each project is analyzed separately in the report, followed by a combined summary, conclusions, and policy suggestions.

Key findings

- Not all pilots have a clear vision. Four pilots said they didn't have one yet, while five said they did. Four of them are in municipalities that already have a municipal heating plan.
- Networking plays an important role. It helps bring in the right stakeholders and build support. Some pilots had clear guidelines for choosing who to involve and held regular meetings. In two cases, this led to the creation of local heat coalitions.
- Networking also helped to build internal support within organizations and municipalities, which in turn helped influence regional policies and planning.
- Learning happened in several ways:
 - Through involving local people and listening to their experiences.
 - In some cases, through co-creation with citizens.
 - By learning from other, earlier projects.
 - By reflecting on their own processes, collecting data, and tracking progress to improve planning and decision-making.
- Governance and regulation varied across the pilots. In some areas, national or local climate agreements (like banning natural gas) helped push AE projects forward. But there are still many regulatory challenges, like permit systems, that need to be addressed.
- Overall, the pilots show there is a need for a national law (a "Collective Heat Act") to manage and regulate shared heating systems using AE sources.



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