CCWaSte4NetZero

Cities as a Test Bed for Climate Neutrality:
Implementing CCS in Waste-to-Energy for a Net-Zero City

TRONDHEIM, NORWAY

Emissions domains addressed by the Pilot Activity

- Consumption of non-electricity energy for thermal uses in buildings & facilities
- Multi-sector waste management & disposal
- Industrial process emissions

Key Terms

WtE-CCS | Carbon capture | Business model development | Climate City Contract | Citizens' assembly | Value chain analysis | Just transition | Stakeholder engagement

Levers of Change

Data and Digitalisation | Democracy and participation | Financing and funding | Governance and policy | Learning and capabilities | Procurement | Social innovation | Technology/infrastructure

Description of the Pilot Activity

Trondheim's pilot addresses one of the city's most critical emissions sources — the waste-to-energy (WtE) plant that accounts for nearly 25% of direct GHG emissions while providing essential urban infrastructure for both waste management and energy supply. CCWaSte4NetZero advances carbon capture and storage (CCS) solutions for this facility, recognising that WtE CCS requires all levers of change: technological, financial, political, and social interventions. The project operates as a quadruple-helix partnership: Lunera Energi AS (Statkraft Varme AS before 1 Dec 2025) (the plant owner who takes final investment decisions), Trondheim Municipality (responsible for climate policymaking), and SINTEF (providing insight on CCS technology and project development across Europe).

Year One Highlights

Trondheim's Year 1 was focused on establishing the technical, financial, and governance foundations for a decision on waste-to-energy carbon capture and storage — a technology with significant decarbonisation potential but requiring alignment across investment, policy, and research before it can advance.

Business model and value chain assessments were completed by Lunera Energi AS and SINTEF, covering technology status, market conditions for carbon removals, financial viability, and regulatory pathways. The project was formally integrated into Trondheim's Climate City Contract, delivered in October 2024, and included as measure R8 in the Climate Budget 2025 — giving it direct policy anchoring. Planning advanced significantly for a Citizens' Assembly scheduled for June 2025, designed to enable structured public and political participation in decisions about WtE CCS implementation, with support from The Democratic Society. The project was presented at the European Week of Regions and Cities in Brussels, the CCUS Midt-Norge conference, and a cross-cutting internal workshop bringing together three work packages and multiple municipal departments.

Innovation Highlights

The quadruple-helix partnership — plant owner, local government, and research institution working together — reflects the reality that WtE CCS cannot advance without simultaneous alignment across investment authority, policy responsibility, and technical expertise. The business model assessment treats the full value chain from capture through transport to storage, rather than evaluating the WtE plant in isolation — essential for identifying where financial viability actually breaks down. The Citizens' Assembly is designed as a governance mechanism, not a communications exercise: its recommendations will feed directly into the next iteration of the Climate City Contract.

Twinning with Tomar (Portugal)

Tomar identified three key interests for learning: CCS, climate governance, and citizen engagement. Two representatives from Tomar visited Trondheim in April 2025, with a site visit to the waste-to-energy plant, a workshop on climate governance and climate budgeting, and a walk-and-talk tour to five different neighbourhoods. Trondheim visited Tomar in autumn 2025 and learned about governance and engagement.

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