

CASE STUDY | LOW CARBON TECHNOLOGY | DISTRICT HEATING

Mechanical installation for a low carbon district heating energy centre

Project overview

PROJECT DATA

PROJECT NAME **Low Carbon Energy Centre - Mechanical Installation**	LOCATION **UK**
SECTOR **Low Carbon Technology / Decarbonisation**	PROJECT DURATION **8 months core scope**
COMPLETION **August 2026**	PROJECT VALUE **Confidential**
CLIENT **Confidential**	DELIVERY **Turnkey mechanical installation**

01 Introduction

District heating networks are a core part of the UK's route to decarbonisation.

Large-scale low carbon energy centres use industrial heat pumps and associated plant to deliver low carbon heat to homes, offices and public buildings across dense urban areas.

Plant of this scale is safety-critical and must be built to protect the long-term integrity of the network. The mechanical installation requires precise fabrication, high-integrity welds, coordinated interfaces with existing services and a fully auditable QA record at handover.

This case study covers PEMEC's turnkey mechanical installation package inside a low carbon energy centre in the UK, including scope, challenges, solutions and outcomes.



02 Scope of work

The mechanical installation scope included:

01 Preconstruction and buildability input

02 Prefabrication of steelwork and pipework, leaving green ends for final site measure

03 Installation of heat pumps and associated equipment

04 Pipework and inline equipment installation

05 Fire-rated ductwork installation

06 Pipework support solutions coordinated around existing services

07 Controlled hydraulic testing with calibrated test equipment

08 Calibrated torque-wrench verification of flanged joints, to manufacturer-approved torque data

09 ITP, test certification and O&M handover



03 Engineering & design

Design and fabrication approach:

- Prefabrication used a green-end approach, with final connections site-measured to avoid rework
- All running lengths were site-welded in line with the client's Employer's Requirements, avoiding long-term flange maintenance
- A revised PRV design during construction required a controlled change from prefabricated to site-run pipework

04 Execution strategy

- Prefabrication of spools and steelwork, with green ends left for final site measure
- Staged site installation phased around upstream steelwork, power availability and material readiness
- Formal recording of programme dependencies and instructed changes throughout

Site team

The team included site management, welders, pipefitters, riggers and mates.

Health, safety & environment

No safety incidents recorded across the programme.

05 Challenges & solutions

CHALLENGE	SOLUTION
Upstream steel riser delay of approx. 40 days	→ Programme updated; dependencies formally recorded; site return re-planned once ready
Late revised design for PRV pipework	→ PRV prefabrication paused to prevent abortive work; switched to site-run fabrication after design review
Heat-meter design issues preventing immediate installation	→ Affected sections held and documented pending design resolution
Site readiness and power dependencies	→ Staged return planned once site power and readiness were confirmed
Long-lead specialist supports around existing services	→ Support solutions designed and coordinated around existing services
Historic snags and open quality records	→ Joint inspections completed; rectification carried out; QA re-certification issued

06 Testing & handover

- Controlled hydraulic testing on in-scope systems, using calibrated equipment with certificates
- Calibrated torque-wrench verification of flanged joints
- Joint inspections and QA re-certification of affected sections
- Test certificates, ITP records and O&M documentation submitted as part of the handover package



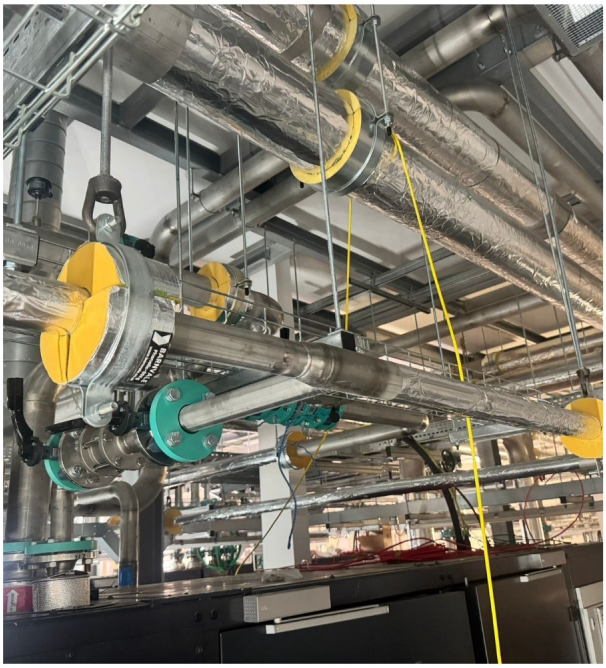
07 Key outcomes

- Delivered on budget, including variations agreed throughout the project
- All running lengths site-welded in line with the client's Employer's Requirements, avoiding long-term flange maintenance

08 Conclusion

This project demonstrated that a complex low carbon energy centre installation can be delivered safely and to a fully auditable quality standard, even when subject to upstream programme delays and mid-contract design change.

Turnkey mechanical delivery covered fabrication, installation, testing and QA close-out through to handover.



One accountable UK partner, from planning to site delivery.

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