

TECHNOLOGY GUIDE

Combined Heat & Power Guide

An accessible introduction to cogeneration, suitable applications, potential benefits and the checks required before proceeding.

Independent advice

Options explained around your property, usage and objectives.

Coordinated delivery

Qualified installation partners selected for the project.

Long-term value

Design decisions focused on performance, usability and aftercare.

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What is Combined Heat and Power?

Combined Heat and Power (CHP), also called cogeneration, produces electricity while recovering useful heat from the same fuel input. The recovered heat can support space heating, hot water or industrial processes instead of being rejected as waste.

- Electricity is generated on site.
- Heat from the engine and exhaust is recovered.
- The thermal output is transferred into the building or process.
- The system is controlled around the site's real energy demand.

CHP is most relevant where electricity and useful heat are required at the same time.

How CHP works

A prime mover - often a gas engine for building-scale applications - drives a generator. Heat exchangers recover energy from the engine cooling circuit and exhaust, and that heat is connected into the site's heating or process system.

- Possible technologies include gas engines, gas turbines, microturbines, fuel cells and steam turbines.
- Fuel options can include natural gas, biogas and other compatible fuels, subject to equipment and regulation.
- Electrical and thermal outputs must be matched to the site.

Potential benefits

- Higher overall fuel utilisation where recovered heat is consistently used.
- On-site electricity generation and reduced grid dependence.
- Potential energy-cost reduction in suitable operating conditions.
- Improved resilience when designed with the necessary controls and infrastructure.
- A route to lower emissions compared with separate heat and power in the right application.

Suitable applications

- Hospitals and healthcare facilities.
- Universities, schools and campuses.
- Hotels, leisure centres and swimming pools.
- Industrial and food-processing sites.
- Large commercial buildings and mixed-use developments.
- District or communal heating systems.

Key design considerations

- The site must have dependable and simultaneous heat and power demand.
- Oversizing can reduce utilisation and weaken the business case.
- Fuel price, electricity price and maintenance costs affect economics.
- Plant space, noise, ventilation, exhaust and grid connection require assessment.
- Emissions, permits, planning and local air-quality requirements must be reviewed.
- Maintenance strategy and downtime arrangements are essential.

CHP feasibility pathway

- Collect electricity and heat-consumption data.
- Map daily, weekly and seasonal demand.
- Identify the usable thermal load and return temperatures.
- Model system sizes and operating hours.
- Assess grid, gas, emissions, planning and plant-room requirements.
- Compare CHP with alternative efficiency, heat-pump and renewable options.

Important qualification

CHP is not automatically the lowest-carbon choice for every site. Its suitability depends on the fuel, operating pattern, heat utilisation, grid carbon intensity and available alternatives. A project-specific energy and carbon assessment is required.

Next step

Send your postcode, recent energy information and a short description of the project. We can then arrange an initial assessment and explain the most useful next stage.

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