

Recommendations on best practice for combustion plant operators

Guidance produced by Ricardo Energy & Environment for City of London Corporation

Operating combustion plant such as generators and boilers/Combined Heat and Power plant can give rise to air quality impacts. This short summary highlights some steps that can be taken to avoid these problems, and points to where more detailed information can be found.

Key points for planning and equipment selection

KP1. Alternatives to combustion-based technologies are available and should be considered at the early stages of project development.

KP2. A range of combustion technologies are available, of which diesel fired generators are among the most polluting. These should be avoided if possible.

KP3. Different regulatory regimes apply to plant with different capacities, fuels, combustion technologies, and proposed uses. This will affect the range of applicable controls, and enforceable emissions limits.

KP4. Plant is designed to achieve different emissions levels, and plant performance may degrade over time. It is important to select plant with appropriate emissions limits and assess potential impacts on a robust basis.

KP5. When selecting a contractor, its credentials, remote monitoring capabilities, helpline facilities, location of and ability to offer consistent engineers and charges, should be considered.

Key Points for maintenance, service and testing

KP6. Maintenance and monitoring should be planned.

KP7. If testing causes problems, neighbours should be contacted to warn of upcoming tests, and identify the least disruptive times for testing to be carried out.

KP8. Tests may need to be scheduled to avoid periods of adverse weather conditions and/or high pollution levels.

KP9. Proper maintenance is vital to ensure the system functions well and does not suffer frequent outages.

KP10. Appropriate training for all operating staff (direct employees or contractors) should be undertaken, regardless of how much or how little involvement with operation they may have.

KP11. Operators should be familiar with and follow the manufacturer's guidance for the individual components of the system, including the generator/boiler itself, the flue system, power/ heat metering, fuel handling equipment, safety procedures, and lubrication of key components.

Key Points for optimal management and operation

KP12. Standby and prime powered diesel generators are usually optimised to run at 50-80% of total load rating. Natural gas generator sets, regardless of application and rating, are almost always optimised to run between 70-100% of total load rating.

KP13. Although systems are available for directly measuring the concentrations of emissions from combustion processes, emissions from smaller scale generators or boilers/CHPs are normally monitored only indirectly via plant performance.

KP14. A remote monitoring and advisory service can help to achieve maximum performance and cost benefits.

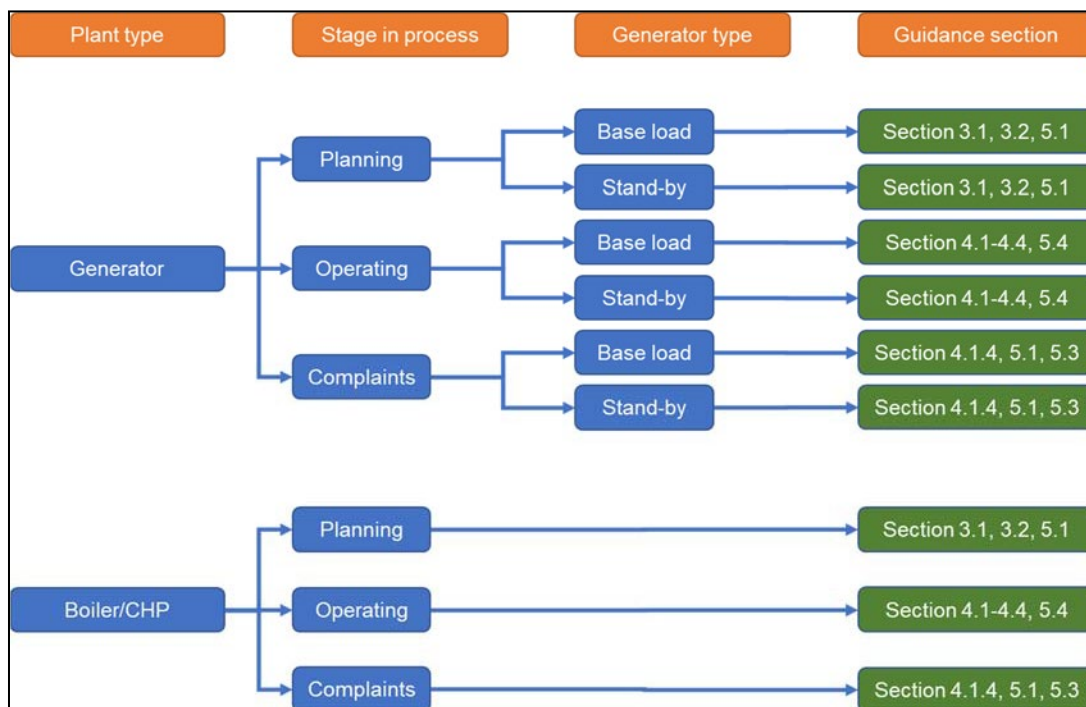
Key Points for flue heights and older / higher emitting plant

- KP15.** LAQM screening tools¹ (e.g. the D1 guidance²) provide a valuable first step in specifying a minimum stack height, however it may not be possible to meet all requirements, which may be an indication that the combustion-based solution should be reconsidered.
- KP16.** There is potential for higher emissions of air pollutants from older plant than for modern plant which may be subject to a higher standard of emission controls – either through type-approval or environmental permits.
- KP17.** It may be possible to retrofit an older plant with emissions abatement technology (e.g. particulate trap / filter or a catalyst), where the chimney height is not adequate to disperse emissions, however this will depend on the engine type.

Key Points for the regulation of combustion plant

- KP18.** An air quality assessment should be carried out to confirm compliance of any proposed combustion plant with requirements on location, stack height, emissions and the absence of significant air quality impacts.
- KP19.** Voluntary measures to minimise impacts on air quality may be at zero cost or low cost to the operator, and in some cases, improvements may result in an economic benefit – for example, resulting from improved plant efficiency or availability.
- KP20.** Clean Air Act controls cannot be applied to combustion plant with an environmental permit (see below) but most permits include a provision regarding dark smoke; if dark smoke is an issue for such a plant then the appropriate regulator can be asked to intervene.
- KP21.** Prior to 2019, generator engines >560kW output were not subject to Non Road Mobile Machinery controls and consequently existing machines, if used as a stationary engine may be subject to the Medium Combustion Plant Directive, and hence require a permit.

Decision tree to identify relevant guidance in full report ([available from City of London](#))



¹ <https://laqm.defra.gov.uk/review-and-assessment/tools/modelling.html>

² <https://laqm.defra.gov.uk/laqm-faqs/faq89.html>