

WHAT IS THE MEDIUM COMBUSTION PLANT DIRECTIVE (MCPD)

The Medium Combustion Plant Directive (MCPD) sets out to bridge the regulatory gap for plants that were not covered by the Large Combustion Plant Directive (LCPD) ≥ 50 MWth. It entered into force in 2015 as part of the clean air policy package, with the aim to reduce emissions that are harmful to human health and the environment.

The MCPD regulates emissions of SO₂, NO_x and dust to air from plants ≥ 1 MWth - < 50 MWth. It also requires monitoring of carbon monoxide (CO) emissions.

Who is affected by the MCPD?

Most stationary combustion plants are in scope of the MCPD, including boilers, engines and turbines. MCPs are used to generate heat for large buildings (such as hotels, offices, hospitals, universities, schools, prisons), industrial processes and agricultural facilities (e.g. greenhouse and livestock building heating), as well as for power generation. It is estimated that around 143,000 MCPs will be affected across Europe with an estimated 35,000 in the UK alone.

It is important to note that any MCP located on an IED regulated site, will fall within the scope of the IED general provisions, creating a regulatory overlap. However, it is clear that any MCPs in this category will be permitted under the IED with MCPD emission limit values also applying as a minimum requirement.

What is the timeline for implementation?

A new plant is defined as an MCP that is put into operation on or after 20 December 2018 whilst an existing plant is an MCP operating before that date. ELV compliance is required from the start of operation for a new plant and from 1 January 2025 for an existing plant (> 5 to < 50 MWth) or from 1 January 2030 (≥ 1 to ≤ 5 MWth). See also Table 6.

Emission Limits Values (ELVs)

EU Member States may apply certain ELV compliance exemptions to different classes of MCP. Gas fired MCPs that suffer a fuel supply interruption may be exempted when firing alternative fuels that would require secondary abatement to comply with the applicable ELVs (for ten days interruption unless the operator can demonstrate to the Competent Authority that a longer period is justified). MCPs that normally fire low sulphur fuel may similarly be exempted from their SO₂ ELVs for a maximum of six months if there is an interruption in the supply of low sulphur fuel due to a serious shortage.

There are a number of other optional exemptions that a Member State may or may not adopt. For existing plants, the main provision is an exemption from ELVs for plants operating ≤ 500 hours per annum, as a rolling average over five years, subject to meeting

a dust ELV of 200 mg/m³ for plants firing solid fuels. This may optionally be extended to 1000 hours for heating plants during exceptionally cold weather events.

There are also time limited derogations for Isolated Systems (applicable to island communities), district heating systems and gas compressor stations within national transmission systems noting that, in some cases, less stringent ELVs are imposed.

For new plants, the main optional exemption is again available for plants operating ≤ 500 hours per annum, as a rolling average over three years, subject to meeting a dust ELV of 100 mg/m³ for MCPs firing solid fuels. There is also an optional series of derogations, specifying less onerous NO_x ELVs, for engines operating between 500 and 1500 hours per annum dependent upon engine type and fuelling. This provision for new engines is surprising given that there is no equivalent provision for existing engines.

The most important ELV provisions are described below by technology type.

Gas turbine Emission Limit Values are given in Table 1 for new plants and Table 2 for existing plants in mg/m³ at 15% O₂, dry, 273K, 101.3 kPa. NO_x ELVs are only applicable over 70% load and there are higher SO₂ ELVs for biogas and higher dust ELVs for small MCPs.

Table 1 Gas Turbine ELVs for NEW plants (mg/m³)

	Natural Gas	Other Gaseous	Gas Oil	Other Liquid
NO _x	50	75	75	75
SO ₂	-	15	-	120
Dust	-	-	-	10

Table 2 Gas Turbine ELVs for EXISTING plants (mg/m³)

	Natural Gas	Other Gaseous	Gas Oil	Other Liquid
NO _x	150	200	200	200
SO ₂	-	15	-	120
Dust	-	-	-	10

Combustion plants - other than gas turbines and engines - have Emission Limit Values as shown in Table 3 for new plants and Table 4 for existing plants in mg/m³ at 3% O₂, dry, for natural gas and liquid fuel firing and at 6% O₂, dry at 273K, 101.3 kPa for solid fuels. There are various SO₂ derogations for plants firing woody biomass, straw, biogas, coke oven gas, blast furnace gas and other solid fuels and also for Heavy Fuel Oil (HFO) firing on existing small MCPs until 2030, noting that secondary abatement

would be required to meet the HFO ELVs. There are also various dust derogations for existing plants firing biomass, other liquid and other solid fuels.

Table 3 Boiler/Other Combustion Plant ELVs for NEW plants (mg/m³)

	Natural Gas	Other Gaseous	Gas Oil	Other Liquid	Solid Biomass	Other Solid
NO _x	100	200	200	300	300	300
SO ₂	-	35	-	350	200	400
Dust	-	-	-	20	20	20

Table 4 Boiler/Other Combustion Plant ELVs for EXISTING plants (mg/m³)

≥ 1 MWth to ≤ 5 MWth

	Natural Gas	Other Gaseous	Gas Oil	Other Liquid	Solid Biomass	Other Solid
NO _x	250	250	200	650	650	650
SO ₂	-	200	-	350	200	1100
Dust	-	-	-	50	50	50

> 5 MWth to < 50 MWth

	Natural Gas	Other Gaseous	Gas Oil	Other Liquid	Solid Biomass	Other Solid
NO _x	200	250	200	650	650	650
SO ₂	-	35	-	350	200	400
Dust	-	-	-	30	30	30

Engine Emission Limit Values are subject to complex derogations. In broad terms, the NO_x ELVs for new plants are 95 mg/m³ for natural gas firing and 190 mg/m³ for liquid fuel firing at 15% O₂, dry, 273K, 101.3 kPa. For existing plants, the NO_x ELV is 190 mg/m³ for all fuels. There are SO₂ ELVs for engines firing liquid fuels other than Gas Oil and gaseous fuels other than natural gas. Also, dust ELVs for engines firing liquid fuels other than Gas Oil.

In geographical zones that are not compliant with the EU's Ambient Air Quality Directive, Member States must assess the need to apply stricter ELVs provided that these would contribute to a 'noticeable improvement in air quality'. The emission levels associated with best available and emerging technologies must be taken into account when assessing the need for stricter ELVs, following an information exchange with Member States, industry and non-governmental organisations (note that this information

exchange report is currently in draft).

The MCPD does allow Competent Authorities to specify continuous monitoring, as an alternative to periodic monitoring, although this would require calibration according to EN 14181 using Standard Reference Methods.

Operators with abatement equipment are expected to define how they will demonstrate that this equipment continues to operate effectively which could, for example, include continuous indicative dust monitoring.

Specified Generator controls in the UK

The UK government has implemented additional controls (except in Scotland) on electricity generating plants of less than 50 MW_{th}. Different regulatory regimes apply to generator plants based on the criteria set out in Table 5. For the specified generator arrangements, the thermal capacities in Table 5 are based on the aggregated capacity at installation level, i.e., the total site thermal input capacity.

Table 5 Classifications under the Specified Generator requirements

Class	Definition
Tranche A 1 – 50 MW _{th}	<ul style="list-style-type: none"> Put into operation before 1st December 2016 or Subject of a capacity market agreement from 2014 or 2015 or For which feed-in tariff preliminary accreditation was received before 1st December 2016
Tranche A < 1 MW _{th}	<ul style="list-style-type: none"> Subject of a capacity market agreement from 2014, 2015 or 2016 or For which feed-in tariff preliminary accreditation was received before 1st December 2017 or Which is the subject of an agreement to provide balancing services entered into before 31st October 2017
Tranche B	<ul style="list-style-type: none"> Anything that does not meet any of the requirements of a Tranche A generator
Back-up plant Exemption	<ul style="list-style-type: none"> Back-up generators (operated for the sole purpose of maintaining power supply at a site during an on-site emergency) operated for the purpose of testing for no more than 50 hours per year
Other relevant exemptions	<ul style="list-style-type: none"> Generators subject to the provisions of Chapter II or Chapter III of the Industrial Emissions Directive

The requirements for specified generators are as follows:

- Compliance with a NO_x emission limit value of 190 mg/m³ (at 15% O₂)
- Compliance with the above requirement within 20 minutes for Tranche A plants and 10 minutes for Tranche B plants where secondary abatement is used
- No persistent emission of dark smoke

There is also a general requirement (for Tranche A and B generators) that the regulator must include stricter measures in the permit where this is required to comply with air quality standards.

The Environment Agency has published supporting documentation covering the permit application process and dates for MCPs and specified generators, including standard rules permits, monitoring guidance and air quality modelling guidance. Existing Tranche B specified generators will require a permit by 1 January 2019, whilst Tranche A generators on sites of greater than 5 MW_{th} with emissions of greater than or equal to 500 mg/m³ (at 15% O₂) which operate for more than 50 hours per year will require a permit by 1 October 2019.

Specified generators must also comply with the MCPD requirements where they are in scope.

Table 6. Timeline for MCP and specified generator permitting requirements.

20/12/2018	New MCPs must be permitted from the start of operations. Emissions tested within 4 months and comply with ELVs
01/01/2019	Tranche B generators must be permitted and comply with standard permit conditions
01/10/2019	Tranche A 5-50 MW _{th} generators with NO _x emissions greater than 500 mg/m ³ which operate for more than 50 hours per year must be permitted
01/01/2024	Existing MCPs above 5 MW _{th} must apply for a permit and test emissions within 4 months of permit issue
01/01/2025	Existing plant above 5 MW _{th} must comply with ELVs Remaining Tranche A 5-50 MW _{th} generators must be permitted
01/01/2029	Existing MCPs 5 MW _{th} and below must apply for a permit and test emissions within 4 months of permit issue
01/01/2030	Existing MCPs 5 MW _{th} and below must comply with ELVs Tranche A 1-5 MW _{th} generators must be permitted

Monitoring requirements

Periodic monitoring of the pollutants for which ELVs are defined is required every three years for MCPs ≥ 1 to ≤ 20 MW_{th} and every year for MCPs > 20 MW_{th}. Monitoring is always required for carbon monoxide (CO) even though this is not subject to an Emission Limit Value. Plants that operate for ≤ 500 hours per annum with an ELV exemption are not exempted from the monitoring requirements but the frequency at which monitoring is required, which is based on cumulative operating hours, is not entirely clear.

The first measurement is required within four months of the plant being permitted/registered, for existing plants, or prior to starting operation, for new plants. If early registration is not allowed then all of the required monitoring for existing plants would be limited to a four month window and would need to be repeated in the same time frame either one or three years later. This is clearly unworkable, given the likely number of MCPs within Europe (hundreds of thousands). Early registration/permitting should therefore be encouraged.

With regards to test methods: 'Sampling and analysis ... shall be based on methods enabling reliable, representative and comparable results ... EN standards shall be presumed to satisfy this requirement ... the plant shall be operating under stable conditions at a representative even load ... start-up and shut-down periods shall be excluded'

There is therefore not an absolute requirement to use ISO 17025 accredited test laboratories or CEN standards (the Standard Reference Methods for NO_x, SO₂, CO and dust are defined by individual CEN standards). However, if these are employed they will automatically satisfy the MCPD monitoring requirements. In any case, the equipment specified for manual dust measurement, and some of the detailed test procedures within the relevant CEN standard, are not suitable for application on plants that are smaller than 20 MW_{th} and further guidance is required. In the UK, MCERTS accredited monitoring is required for plants that are deemed to pose a significant environmental risk.

In many EU Member States, boiler emissions are already measured during annual or six-monthly service visits using equipment that is certified to appropriate CEN standards that apply to boiler testing. Provided that the procedures, staff training and quality systems that underpin these measurements are robust and can satisfy the MCPD requirements, it may be possible to use such an approach, at least for plants ≤ 20 MW_{th}. This would also share the burden with regards to the scheduling of test work.

In the UK, a simplified monitoring approach for MCPs that are considered to pose a low environmental risk is defined in the Environment Agency's Technical Guidance Note M5.

UK MCPD Monitoring requirements

≥1MW - ≤20MW) (NO _x , SO ₂ & CO)	Handheld Emission Monitoring System (HEMS) <ul style="list-style-type: none"> Portable monitoring systems must be selected that have met the requirements of MCERTS certification for emissions monitoring systems (this includes the MCERTS schemes for T-CEMs and HEMS) As an interim, existing systems that have been assessed to EN 50379-2 may be used, provided the assessment has been made by an organisation accredited for the performance tests (e.g. TÜV). When HEMS are replaced they shall be replaced by analysers that have MCERTS certification. From 01/01/2025 all HEMS shall be MCERTS certified.
>20MW - <50MW & biomass ≥1MW - <50MW (NO _x , SO ₂ & CO)	MCERTS accredited organisation – Transportable (T-CEMS) Emission monitoring system certified to EN 15267-4, More information available at www.mcerts.net or www.s-t-a.org
≤1MW - <50MW (Particulate)	Where Particulate monitoring is required it shall be carried out by an organisation with MCERTS accreditation for EN 13284-1

The Source Testing Association (STA)

A specific training course has been developed by the STA on the monitoring and permitting requirements for the MCPD.

The (STA) is a non-profit making organisation providing technical support, knowledge transfer and training to industry established in 1995.

The STA is committed to the advancement of the science and practice of emission monitoring and to develop and maintain a high quality of service to customers.

Its aims and objectives are to:

- contribute to the development of industry standards, codes, safety procedures and operating principles;
- encourage the personal and professional development of practicing source testers and students;
- maintain a body of current sampling knowledge;
- assist in maintenance of a high level of ethical conduct;
- seek co-operative endeavours with other professional organisations, institutions and regulatory bodies, nationally and internationally, that are engaged in source emissions testing.

The Association offers a package of benefits to its members which include:

- Technical advice relating to emission monitoring
- Conference and exhibition opportunities
- Seminars and training on a variety of related activities
- Representation on National, European and International standards organisations
- Training in relation to many aspects of emission monitoring
- Liaison with regulators, UK and International, many of whom are members.

Website; www.s-t-a.org, Technical support line, 01462 457535 ext. 2

Uniper

Uniper have been involved with the MCPD from the early stages, providing technical support to the energy sector and industry through the European legislative process and through UK implementation. We can provide a range of supporting services for operators of MCPs and specified generators including:

- Interpretation of the legislation and guidance
- All aspects of permit applications
- Air Quality Assessments
- MCERTS accredited emission testing for permit compliance
- Part B BAT and CHP cost-benefit assessments
- Advice on emission reduction and abatement techniques

Website; <https://www.uniper.energy/services/solutions/power/compliance-risk-and-safety/MCPD>

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