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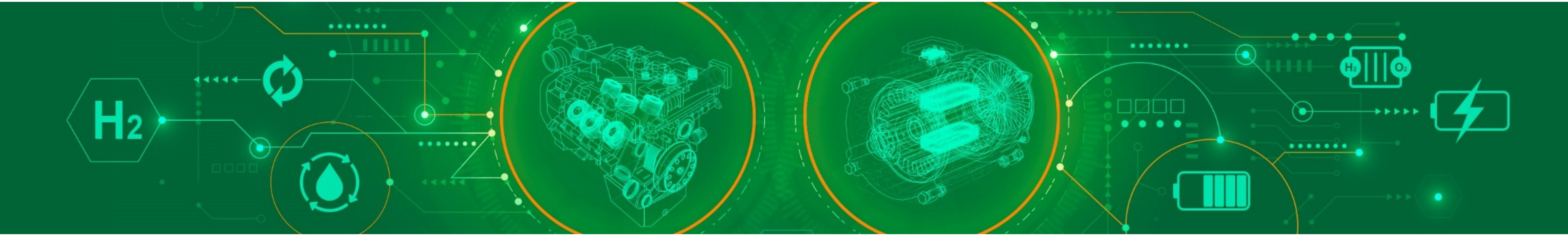
EU Omnibus VIII — Proposal 2025/0394 (COD) / COM(2025) 986 final as of 10 Dec 2025
amending Directives 2008/98/EC, 2010/75/EU, (EU) 2015/2193 and (EU) 2024/1785

Hydrogen combustion NO_x emissions

Gas blends with enhanced H_2 concentration and pure H_2 as fuel



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This is EUROMOT

The European Association of Internal Combustion Engine and Alternative Powertrain Manufacturers

Legal status

- International non-profit association under Belgian law (association internationale sans but lucratif, aisbl).
- Founded in **1991** in London.
- Registered in the **EU Transparency Register**, ID no. 6284937371-73 — legal and financial status, sources of income, staff and legal representatives all public.
- **Code of Conduct** based on the compliance provisions of Orgalime, the European Engineering Industries Association.

Mission and scope

- The interest representation for manufacturers of **industrial internal combustion engines and alternative powertrain systems**.
- Facilitate regulation for powering safe, reliable and environmentally friendly mobile machinery and stationary applications.
- Consolidate and communicate the combined knowledge of the industry to deliver sustainable innovation and the energy transition.
- Act as the **centre of excellence** for businesses, authorities, regulators and public stakeholders.

Sectors covered

- Nonroad mobile machinery · Petrol · Small diesel · Stationary · Rail
- Marine: seagoing, inland waterways and recreational craft
- Internal combustion engines, alternative powertrain and advanced energy sources
- Organised as **General Assembly** → **Board** → **General Secretariat**, with working groups, subgroups and task forces per sector.

Geographical outreach

- NGO in **consultative status** at UNECE (Geneva), UN IMO (London — representing engine manufacturers worldwide) and the CCNR.
- **Co-founder of IICEMA** (2012) with the lead associations of the US, China, Japan, India and Europe.
- Well-established bilateral networks into the world's key markets, and liaison with CEN and ISO.

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AGCO POWER
BRIGGS & STRATTON
CATERPILLAR
CNH
Cummins
DAIMLER TRUCK
DEUTZ
DUMAREY
Emak our power, your passion
Everllence
GENERAC
HATZ
HONDA
HORSE
Husqvarna
HD HYUNDAI INFRACORE
ISUZU
IVECO GROUP
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MOTEURS Baudouin
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Background: why hydrogen needs a different normalisation

- In Europe, the mass concentration of NO_x in flue gas is regulated by setting **Emission Limit Values (ELVs) in mg/Nm^3** at a reference condition of **15 vol-% O_2, dry**.
- The normalisation factors to the reference O_2 content of 15 vol-% are very similar for different hydrocarbons, **but significantly different for hydrogen**.
- Burning H_2 at the same thermal input as methane (CH_4) produces more H_2O and no CO_2 in the flue gas. Removing that H_2O for dry-basis measurement is equivalent to an **increased concentration** of the measured component — so a different normalisation, referring to **energy-specific units** rather than flue gas volumes, is required /3/.

Fuel	Natural gas[1]	Gas oil	Fuel oil	Hydrogen
Fuel factor (m^3/MJ) at 15 vol-% O_2, dry — unit conversion factor	0.845	0.859	0.873	**0.616**
ELV correction factor relative to natural gas	1.000	0.984	0.968	**1.372**

Table 1 — Flue gas volume correction factors for hydrocarbon and hydrogen fuels, case 15 vol-% O_2 /3/. [1] *Methane (CH_4) basis.*

Worked example: the penalty on hydrogen /1/

A NO_x ELV of 75 mg/Nm^3 at 15 vol-% O_2, dry, expressed on an energy basis

Natural gas — ELV 75 mg/Nm^3

63.38 mg/MJ

75 mg/Nm^3 × 0.845 m^3/MJ

Hydrogen — same ELV of 75 mg/Nm^3

46.2 mg/MJ

75 mg/Nm^3 × 0.616 m^3/MJ → **27 % stricter** in energy terms

To achieve parity, hydrogen needs an ELV of 102.9 mg/Nm^3 at 15 vol-% O_2, dry

- 102.9 mg/Nm^3 × 0.616 m^3/MJ = **63.38 mg/MJ** — the same energy-based emission as natural gas at 75 mg/Nm^3.
- In other words: an ELV set in mg/Nm^3 for pure hydrogen must be multiplied by a **correction factor of 1.372** to achieve parity with natural gas.

Proposal: Commission text vs. industry amendment

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Same recital, three substantive changes — industry changes shown in bold

Commission proposal

- Exemption applies only to plants firing gas with **more than 20 % (by volume)** of hydrogen.
- Member States ensure that the **overall load of NO_x released over one year is not increased** compared with the natural-gas ELV situation.
- "In such cases, monitoring and compliance should be adjusted accordingly."

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- Exemption applies to plants firing gas **blended with / or pure hydrogen — no 20 vol-% threshold**.
- The overall load of NO_x **in mg/MJ_{fuel}** is **on par / not increased** compared with the natural-gas ELV situation.
- The NO_x concentration limit set for natural gas is **corrected according to an inserted graph** when burning H_2–natural gas blends or pure H_2.
- NOx and O2 concentration measurement and correction to the reference O2 — compliance measurements exactly as today.

Full Commission recital: see previous slide and Annex I.

The Commission's proposal — and the problems it creates

Commission proposal — recital

… Therefore, to simplify the use of hydrogen as a fuel, the emission limit values set out in point 6 of Part 1 and point 6 of Part 2 of Annex V to Directive 2010/75/EU, as well as in Annex II of Directive (EU) 2015/2193, should not be applicable to combustion plants firing gas with **more than 20 % (by volume) of hydrogen***.*

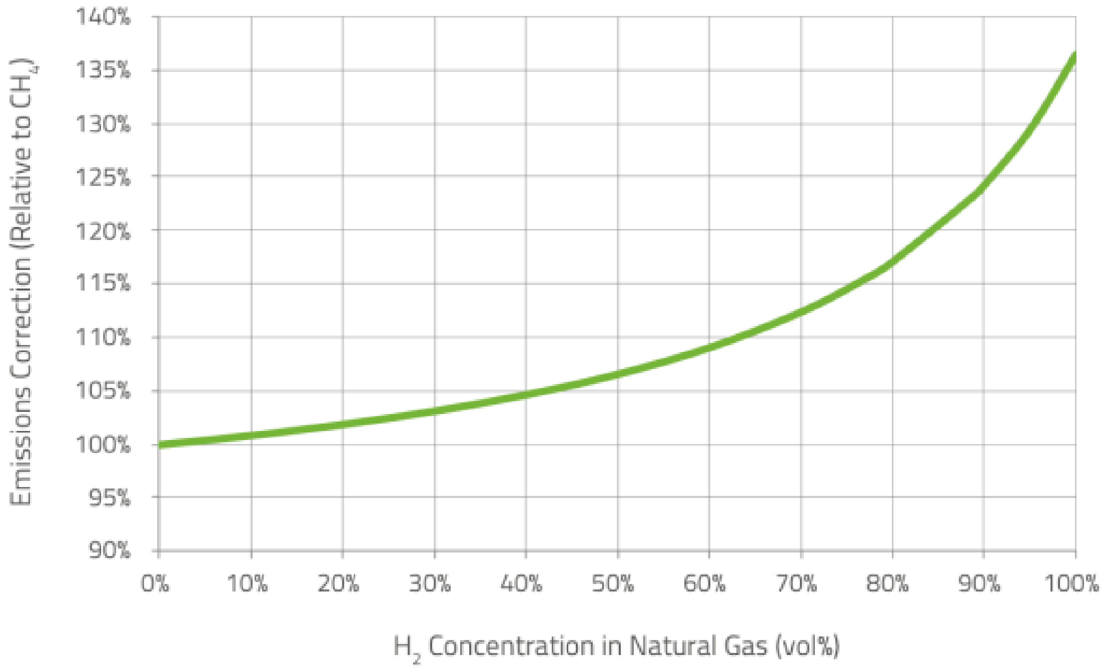
For such plants, Member States should ensure that the **overall load of NO_x eventually released into the air over one year is not increased** *compared to the situation where the emissions from the installation concerned would remain compliant with the emission limit values set out for NO_x for the combustion of natural gas, without prejudice to stricter measures required pursuant to Article 18 of Directive 2010/75/EU and Article 6(9) of Directive (EU) 2015/2193.*

In such cases, monitoring and compliance should be adjusted accordingly. …

Issues with the Commission's proposal

- It requires a **mass** emission calculation for NOx emission limit compliance.
- The "overall load (mass) of NO_x over one year" is **not defined**. Mass-flow measurements can carry large uncertainties.
- It adds unnecessary cost to emission measurements.
- It adds an additional burden to using hydrogen instead of natural gas in boilers, gas turbines and stationary engines.
- Possible NO_x non-compliances would only be **detected late** — after the annual assessment.

Energy-based H_2 correction curve /2, 3/



Graph 1, Correction factor for calculation of NO_x emission concentration with Hydrogen fuel compared to natural gas case (ETN Position Paper)

Note

- The correction curve is suitable for **all gas-fired prime mover technologies**:
  - stationary engines and gas turbines (15 vol-% O_2)
  - boilers (3 vol-% O_2)
- It therefore works with **varying reference oxygen contents**, because the correction is made on an energy basis.

Potential consequences vs. benefits

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Commission's proposal: Potential consequences

- Requires a mass emission calculation for NOx emission limit compliance.
- The “overall load (mass) of NO_x over one year” is not defined; mass-flow measurements can carry large uncertainties.
- Adds unnecessary cost to emission measurements.
- Adds an additional burden to using hydrogen instead of natural gas in boiler, gas turbine and stationary engine plants.
- Possible NO_x non-compliances would be detected late.

Industry proposal: Benefits

- No mass calculations required for NOx emission limit compliance.
- Same emission measurement procedure for natural gas and hydrogen (concentration based).
- No cost difference between natural gas and hydrogen emission measurements.
- Uses a simple **energy-based H_2 correction factor** — depending on the H_2 content of the fuel gas mix — in the compliance-checking procedure.
- The proposed “H_2-NO_x concentration” procedure applies to **all** gas-fired prime movers (boilers, gas turbines, stationary engines), enabling simplified measurement and cost savings.
- Possible NO_x non-compliances can be detected and remedied quickly.

References

/1/ EUROMOT Position, “Amendment proposals for 2025/0394 (COD) / COM(2025) 986 final (Annexes 1 and 2)”

2025_0394_COD-EUROMOT-Amendments-IED-MCPD-2026-03-10.pdf

/2/ EUROMOT Position Paper, “Power plant emission with hydrogen as energy carrier”, 19 November 2025

euromot.eu — position paper (PDF)

/3/ ETN Position Paper, “Proposed NOx emissions reporting for hydrogen-containing fuels”, March 2023

etn.global — position paper (PDF)

Back-up

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- **Annex I** — Commission proposal: background and note
- **Annex II** — Commission's overall-load approach (I) vs. H_2-NO_x concentration procedure (II)
- **Annex III** — Calculation example: comparison with the EU IED NO_x limit

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Annex I — Commission proposal

- Hydrogen combustion does not produce CO_2. However, when the hydrogen content of the fuel increases, NO_x emissions also increase, whereas the NO_x limit values currently set out in the **IED 2010/75/EU** and the **MCPD (EU) 2015/2193** do not take such an increase into account.
- Therefore, to simplify the use of hydrogen as a fuel, the emission limit values set out should not be applicable to combustion plants firing gas with more than 20 % (by volume) of hydrogen. For such plants, Member States should ensure that the overall load of NO_x eventually released into the air over one year is not increased compared with the situation where the emissions from the installation concerned would remain compliant with the emission limit values set out for NO_x for the combustion of natural gas. In such cases, monitoring and compliance assessment should be adjusted accordingly.

Note

- Current NO_x emission limits in the EU IED and MCPD are expressed as **concentrations** (ppm-v, or mg/Nm^3 at 15 vol-% O_2 for gas engines). This is practical and straightforward: NO_x and O_2 concentrations in the flue gas are measured and the measured NO_x is corrected to the prescribed O_2 reference condition, as is done today. The result is then compared with the energy-based, H_2-factor-corrected EU IED or MCPD natural gas NO_x limit.
- The Commission's proposed limit — “overall load over one year is not increased” — would unfortunately make the process **more complicated and more burdensome** than today's procedure.
- NO_x correction should start already at **low H_2 blend ratios (> 0 vol-%)** in the fuel gas, in order to spur the use of hydrogen also where only limited volumes are available — getting H_2 use started, so that it can later be expanded to a 100 vol-% H_2 ratio.
- The EUROMOT proposal maintains today's NO_x measurement simplicity and enables direct comparison with the NO_x emission limits set for natural-gas-fired plants in the EU IED and MCPD.

Annex II — Overall load (I) vs. concentration procedure (II)

I. Commission — overall load (total mass) over one year

- Required CEMS measurements for the annual total NO_x mass calculation as alternatives periodic measurements or calculations (estimates) praxis are not accurate enough:
  - NO_x and O_2 concentrations of the flue gas in the stack
  - **(additional) mass-flow measurement*** of the flue gas in the stack
- All “extra” CEMS measurement needs trigger additional, time-consuming and expensive calibration procedures under **EN 14181** — QAL1, QAL2 (AST) and QAL3.

II. H_2-NO_x concentration procedure

- NO_x and O_2 concentration measurement and correction to the reference O_2 — **exactly as today**.
- The natural gas NO_x limit in the EU IED / MCPD is corrected with the **energy-based H_2 factor** taken from the correction curve.
- Only one additional input is needed: the **H_2 content of the fuel gas**, from the fuel supplier.
- The same installed CEMS equipment or periodic measurement procedure is maintained.
- Applicable to all gas-fired prime movers: boilers, gas turbines and engines.

With Option II, time and money are saved and NO_x non-compliances are detected and remedied quickly compared with Option I. Current NO_x measurement practice is maintained — no investment in new skills or equipment — and the procedure is suitable for all gas-fired prime movers (boilers, gas turbines and engines).

** Exhaust gas flow measurement uncertainty in a flue gas duct typically ranges from ±3 % to over ±10 %, depending heavily on flow disturbances, duct geometry, etc.*

Annex III — Calculation example vs. the EU IED NO_x limit /2/

The Large Combustion Plants Directive (consolidated Industrial Emissions Directive, **IED 2010/75/EU**) specifies the following NO_x emission limits for new natural-gas-fired lean-burn engines:

LCP — large combustion plants > 50 MW_{th}

Natural gas	NO_x (mg/Nm³ at 15 vol-% O_2)	CO (mg/Nm³ at 15 vol-% O_2)
New plants	75	100

Table 2 — NO_x and CO emission limits for a new lean-burn engine operating on natural gas.

Applying the hydrogen correction factor

The Directive establishes an ELV for NO_x of **75 mg/Nm³ at 15 vol-% O_2 (dry)**. Applying the hydrogen emission correction factor of **1.372**, the corresponding limiting value for NO_x emissions under 100 % hydrogen operation is **102.9 mg/Nm³ at 15 vol-% O_2 (dry)** — allowing theoretically the same pollutant mass flow from the stack per unit of fuel energy used (mg/MJ_{fuel}).

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