The European Association of Internal
Combustion Engine Manufacturers

EUROMOT

EUROMOT POSITION

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Comments regarding proposals:

"Projet d'arrêté relatif aux prescriptions générales applicables aux installations classées pour la protection de l'environnement soumises à déclaration sous la rubrique # 2910-A: combustion"

and

"Projet d'arrêté relatif aux installations de combustion d'une puissance thermique nominale supérieure ou égale à 20MW"

EUROMOT welcomes this opportunity to provide input to the consultation on the changes regarding two French proposals concerning internal combustion engines legislation.

As an overall principal, the EUROMOT supports a harmonised and aligned internal combustion legislation in the European Union and internationally. For this reason, EUROMOT welcomes the proposal to harmonise the reference level of oxygen to 15 % O2 as is international practice.

In the following text, EUROMOT provides a comprehensive list of comments regarding the complex French proposals affecting internal combustion engines. From this list we would like to highlight two especially important items:

- The engine manufacturing industry needs hydrocarbon emission limit values such as for non-methane volatile organic compounds or formaldehyde, which are achievable with current best available technique while at the same time taking into account different existing gas qualities,

- EUROMOT strongly recommends retaining the present emission limit value for highspeed internal combustion engines running less than 500 hours per year. This is the lowest reasonable non-aftertreatment forcing standard used for non-road engines up to 5 MWth and functionally aligned with rules world-wide.

1. Combustion facilities with a thermal capacity between 2 - 20MW ("Projet Declaration")

- In **article 7** of the declaration, the emission limit values for carbon monoxide, non-methane volatile organic compounds and formaldehyde do not appear to have been converted to 15% O2. In the consultation meeting, the internal combustion engine industry has shown that a NMVOC limit of 150 mg/Nm3 at 15 % O2 is not achievable[1] with certain widely used natural gas qualities containing high proportions of ethane and propane, e.g. Algerian or Troll gas. The Large Combustion Plants BREF considers a formaldehyde limit of 23 mg/Nm3 at 15 % O2 to be a sufficient surrogate for hydrocarbon emission[2]. Some member states including Germany already follow this approach.

  EUROMOT urges France to set hydrocarbon emission limit values which are achievable with current best available technique while at the same time taking into account different existing gas qualities. EUROMOT recommends focussing on setting a formaldehyde emission limit value as a surrogate for hydrocarbon emissions.

- **Article 7** "Installations declared after 01 January 2013 should comply with the following limit values as from 01 January 2013":
  - **Footnote (2): EUROMOT is concerned with the proposed NOx limit for new liquid fuelled engines 2-20 MWth running less than 500 hrs/year (450 mg/m3 at 15%O2) for following reasons:**
    - In most cases, the proposed low emission limit value will force engine installations to install aftertreatment in the form of Selective Catalytic Reduction (SCR). For applications with low running hours, the cost of installation and operation of an aftertreatment system (i.e. SCR) to meet the proposed limit is not cost-efficient and does not represent best available technique.
    - The proposed emission limit value is not functionally equivalent or aligned to any other European or international legislation concerning internal combustion engines. In comparison, the current limit of 750 mg/m3 is not only similar to the old TALuft which is often commercially requested for low running hour applications but also to the currently used U.S. Tier 2 requirements which will continue to apply to emergency engines in the foreseeable future. Consequently, there are many different engines available to meet the current NOx limit without an aftertreatment system.

    EUROMOT strongly recommends retaining the present emission limit value for highspeed internal combustion engines running less than 500 hours per year which is the lowest reasonable non-aftertreatment forcing standard used for non-road engines up to 5 MWth and functionally aligned with rules in other areas: 750 mg/m3 at 15% O2. By this measure, the French authorities would avoid the introduction of SCR, a measure that should be restricted to continuous use.

[1] Secondary abatement of ethane and propane is an unsolved challenge for internal combustion engines installations. See Figure 5 in the section on ethane and propane of the ASME paper on oxidation catalyst. The paper shows the very low reduction of ethane and propane! Link: http://www.dcl-inc.com/images/stories/PDF/MediaCenter/Papers/16.pdf

[2] See LCP BREF, chapter 7.5.4 page 480 last paragraph http://eippcb.jrc.es/reference/BREF/lcp_bref_0706.pdf

- **Gas fuels – SO2/PM:** EUROMOT recommends deleting the SO2 and dust emission limit values. These represent an additional burden for operators without any significant environmental benefit as actual emission levels are very low.

  In this context, **EUROMOT supports regulating the sulphur** levels in the pipeline gas in order to maintain current low sulphur contents in natural gas and corresponding low SO2 and PM emission levels. Furthermore, EUROMOT supports using sulphur-free odorisation to lower the sulphur content in the natural gas.

- **Gas fuels – NOx:** Most spark-ignited (SG) type lean burn gas engines can fulfil the proposed limit by engine tuning. Nevertheless, EUROMOT would like to highlight that this low NOx emission limit value comes at a cost as fuel consumption increases and unburned emissions increase steeply (such as NMHC, CO, formaldehyde, etc). Furthermore, the flue gas temperature drops which is negative for performance of oxicat aftertreatment systems and heat recovery.

- **Liquid fuels - NOx**: Please note that diesel engines plants will require SCR in order to comply with the emission limit value of 225 mg/Nm3. Reagent consumption is the main cost impact of a SCR. Especially for remote installation the cost impact [3]will be big with the new stricter NOx limit! Euromot is of the opinion that in the Overseas Departments and Territories this strict Nox limit should be lowered.

- **Liquid fuels - Dust**: For dust, an emission limit value of 20 mg/Nm3 is proposed. For diesel engine plants running on HFO this does not represent BAT, as these plants can only comply with expensive aftertreatment systems (ESP). Please note that BAT also considers cost impact.

  For internal combustion plants operating on HFO, **EUROMOT therefore recommends** an emission limit value of 50 mg/m3 at 15% O2 (this value is also given in the Large Combustion Plant BREF).

- **Footnote 1** regarding low pressure gas dual fuel engines (DF). EUROMOT recommends raising the emission limit value to 187 mg/m3 at 15% O2 in order to avoid the use of SCR. Note also comment above for gas quality impact. Especially for grid peaking plants SCR is not BAT as is described in the Large Combustion Plant BREF. EUROMOT would like to highlight that for high pressure gas-diesel engines (GD type) the limit of 187 mg/Nm3 at 15 % O2 is only achievable with an SCR, the GD engine should be treated in pair with liquid fired diesels.

- Furthermore, **EUROMOT urges France** to consider the situation of remote areas (e.g. remote islands) with a restricted existing infrastructure. Remote islands should also be granted the possibility to comply with engine legislation using primary technique and not having to utilise SCR. EUROMOT recommends following the revised Gothenburg Protocol (not yet in force). Under the revised Gothenburg Protocol, new medium / slow speed stationary

[3] Table 3 shows that from source: http://www.unece.org/fileadmin/DAM/env/documents/2011/eb/wg5/WGSR49/Informal%20docs/17_EGTEI-Cost-stationary-engines-UNECE-06-04-2011.pdf

diesel engines (below 1,200 rpm) burning HFO situated in remote areas have to comply with an emission limit value of 1,300 mg/m³ at 15 % O2 for engine unit sizes 5-20 MWth.

- **Footnote 3**: DF engine in liquid mode will need a SCR to fulfil set NOx limit of 450 mg/Nm3 at 15 % O2. SCR is not BAT for engines with frequent start/stops, e.g. grid peaking as discussed above. A derogation from emission compliance should be given for liquid mode (as in current IED), if the liquid mode is only used as back-up for cases of sudden interruption of gas supply. A DF engine in light fuel oil mode can fulfil 1460 mg/Nm3 at 15 % O2 by primary abatement measures, for HFO level is 1850 - 2000 mg/Nm3 at 15 % O2 dependent on fuel consumption. Gas-diesel engine plants should be treated the same as liquid fired diesels.

- **Article 7:** "Installations declared between 01 January 1998 and 01 January 2013 should comply with the following limit values at the latest as from 01 January 2016":

  - **Gas fuels**: The proposed emission limit value for NOx is 130 mg/Nm3 (15 % O2). The current value is retained and this is achievable for lean burn spark ignited gas engines (SG type): EUROMOT would like to highlight that this low NOx emission limit value comes at a cost as fuel consumption increases and unburned emissions increase steeply (such as NMHC, CO, formaldehyde, etc) in comparison with engines tuned to NOx 187 mg/Nm3 at 15 % O2. Furthermore, the flue gas temperature drops which is negative for performance of oxicat aftertreatment systems and heat recovery. A DF type gas engine has to use SCR to achieve proposed limit. See also proposed gas quality dependent limits for DF by Euromot.

  - **Gas fuels – SO2/PM:** EUROMOT recommends deleting the SO2 and dust emission limit values. These represent an additional burden for operator without any significant environmental benefit as actual emission levels are very low.

    In this context, **EUROMOT supports regulating** the sulphur levels in the pipeline gas in order to maintain current low sulphur contents in natural gas and corresponding low SO2/PM emission levels. Furthermore, EUROMOT supports using sulphur-free odorisation to lower the sulphur content in the natural gas.

  - **Liquid fuels:** The limit requires all liquid fired engines to install SCR. Due to the lowering of NOx emission limit values a higher reagent consumption and thus higher electricity price. Existing SCRs might also need to be extended due to higher reduction performance, is room available ? Modification cost might thus be high in an existing compact plant.

  - **Footnote 2:** For other engine types (such as medium speed) than non-road other emission limits is neded, see above.

  - **Footnote 3** In the case of motors using a pilot injection ignition system (dual fuel motor) when they are used in liquid fuel mode, the limit value is set to 710 mg/m3. This will make it necessary for dual fuel engines to use SCR in liquid fuel mode. In EUROMOT's opinion dual fuel engines should not be required to use an SCR just for the back-up mode. A derogation from emission compliance should be allowed for sudden interruption gas supply cases.

Therefore **EUROMOT recommends** raising the emission limit value for dual fuel engines in back-up mode to following values:

- In light fuel mode: 1460 mg/Nm3
- In HFO mode: 1900 mg/Nm3

- **Article 7**: "Up to 31 December 2015 at the latest, installations declared between 01 January 1998 and 01 January 2013":

  - **Gas fuels**: The proposed emission limit value for NOx is 130 mg/Nm3 (15 % O2). The current value is retained and this is achievable for lean burn spark ignited gas engines (SG type). Nevertheless, EUROMOT would like to highlight that this low NOx emission limit value comes at a cost as fuel consumption increases and unburned emissions increase steeply (such as NMHC, CO, formaldehyde, etc). Furthermore, the flue gas temperature drops which is negative for performance of oxicat aftertreatment systems and heat recovery.

  - **Gas fuels – SO2/PM:** EUROMOT recommends deleting the SO2 and dust emission limit values. These represent an additional burden for operator without any significant environmental benefit as actual emission levels are very low.

    In this context, **EUROMOT supports regulating** the sulphur levels in the pipeline gas in order to maintain current low sulphur contents in natural gas and corresponding low SO2 emission levels. Furthermore, EUROMOT supports using sulphur-free odorisation to lower the sulphur content in the natural gas.

  - **Footnote 2**: DF engine in liquid mode have to be equipped with SCR to fulfil limit pf 710 mg/Nm3 at 15 % O2. The same applies for GD). As commented above, EUROMOT recommends a derogation for back-up operation in the case of sudden fuel interruption.

  - **Footnote 3:** When the installation's period of operation is less than 500h/year, the limit value is set to 750 mg/m3. This emission limit value is not achievable for medium-speed engines and they will have to install SCR. In EUROMOT's opinion this does not represent Best Available Technique (BAT) for medium speed engines as there are problems with heating the SCR when operating less than 500 h/year.

    EUROMOT recommends setting a limit value of 1460 mg/Nm3 at 15 % O2. SCR is not BAT for plants with less than 500 operating hours as the SCR needs to heat up.

  - **Footnote 5**: As commented above, please note that DF engine are sensitive to fuel gas quality. Gas-diesel engines (GD) will have to use SCR with the proposed. EUROMOT recommends treating similar to liquid-fired diesels.

- **Article 7** "Installations declared before 01 January 1998 should comply with the following limit values at the latest as from 01 January 2016":

  - **Gas fuels - NOx**: The proposed emission limit value for NOx is 130 mg/Nm3 at 15 % O2. The current value is retained and this is achievable for lean burn spark ignited gas engines (SG type): EUROMOT would like to highlight that

this low NOx emission limit value comes at a cost as fuel consumption increases and unburned emissions increase steeply (such as NMHC, CO, formaldehyde, etc). Furthermore, the flue gas temperature drops which is negative for performance of oxicat aftertreatment systems and heat recovery. Dual-fuel (DF) and gas-diesel (GD) types have to apply SCR for compliance with proposed limit value. Euromot recommends that DF and GD engine types have their own emission limits such as 187 mg/Nm3 for DF running on good gas quality (MN > 80 gases), GD should be treated the same as liquid-fired diesels.

- **Gas fuels – SO2/PM:** EUROMOT recommends deleting the SO2 and dust emission limit values. These represent an additional burden for operator without any significant environmental benefit as actual emission levels are very low.

  In this context, **EUROMOT supports regulating** the sulphur levels in the pipeline gas in order to maintain current low sulphur contents in natural gas and corresponding low SO2 emission levels. Furthermore, EUROMOT supports using sulphur-free odorisation to lower the sulphur content in the natural gas.

- **Footnote 1 – Low pressure gas dual fuel engines** in gas mode can achieve an emission limit value of 185 mg/Nm3 (at 15 % O2) NOx, however, this is only possible when operating on good gas quality with a MN (Methane Number) greater than 80.[4] In this context, EUROMOT is very concerned about discussions surrounding proposals in Europe to significantly reduce the gas quality in the gas pipeline. If the gas quality is reduced emissions will increase and the current NOx limit needs to be maintained.

- **EUROMOT would like to highlight** that for high pressure gas diesel engines (GD type) the limit of 185 mg/Nm3 at 15 % O2 is achievable only by SCR. GD should be treated the same as liquid-fired diesels.

- **Footnote 2:** A DF engine needs SCR to fulfil the requirements. Please also note EUROMOT's recommendations regarding a derogation in case of interruption of gas supply.

- **Article 7:** "Up to 31 December 2015 at the latest, installations declared before 01 January 1998 should comply with the following limit values:"

  - **Gas fuels:** EUROMOT recommends deleting the SO2 and dust emission limit values. These represent an additional burden for operator without any significant benefit as actual emission levels are very low. In this context, EUROMOT supports regulating the sulphur levels in the pipeline gas in order to maintain current low sulphur contents in natural gas and corresponding low SO2 emission levels. Furthermore, EUROMOT supports using sulphur-free odorisation to lower the sulphur content in the natural gas.

  - **Liquid fuels:** The emission limit value for internal combustion engines with a rotation speed below 1200 rpm (medium speed engine) is set at 1060mg/Nm3.

[4] For further details on dual fuel engines:
http://www.unece.org/fileadmin/DAM/env/documents/2011/eb/wg5/WGSR49/Informal%20docs/10_UNECE_WGSR49_EUROMOT_Dual_Fuel_Engine_2011-08-15.pdf
and Euromot Position paper on EEASE Gas proposals http://www.euromot.org/download/3efba876-3c46-48db-9569-426a64461432/GAS%20QUALITY%20euromot%20position%202011_05.pdf

Please note that at this low NOx emission limit value internal combustion engines will have to be equipped with SCR in order to comply. SCR impact cost might be considerable (see texts above).

- **Footnote 2**: A DF engine needs SCR to fulfil the requirements. Please also note EUROMOT's recommendations regarding a derogation in case of interruption of gas supply.

- **Footnote 3:** EUROMOT would like to highlight that that if the emission limit value is set at 1,100 mg/m3 large stationary engine plants running on liquid fuel will need SCR to comply. In EUROMOT's opinion this does not represent BAT.

  EUROMOT recommends setting the NOx emission limit value for remote areas at 1460 mg/Nm3 at 15 % O2. This will allow existing internal combustion engine plants in remote areas to use the latest primary abatement technique to reduce NOx emission levels without having to resort to SCR.

- **Footnote 5** regarding installation's operating less than 500h/year. The emission limit value is set at 1,120 mg/m3. For medium-speed liquid fired diesel engines, SCR would be the only option to comply with all the NOx limits < 1120 mg/Nm3 at 15 % O2!

- **Article 11:** The Industrial Emission Directive (2010/75/EU) requires continuous emission measurement and monitoring only for combustion plants of 100 MWth or more.

  EUROMOT recommends aligning French legislation to the rules set in the Industrial Emissions Directive. Requiring small combustion plants to apply continuous emission measurement is a disproportionate burden for operators of small combustion plants resulting in high costs with little or no environmental benefit.

2. Combustion facilities with a thermal capacity above 20MW ("Projet Autorisation")

- For plants equal to or greater than 50 MWth, EUROMOT recommends aligning closely to the Industrial Emissions Directive (2010/75/EU).

- **Definitions:** EUROMOT recommends adding a definition of gas-diesel engine (GD) and correcting the definition of dual fuel engines (DF). EUROMOT proposes following definitions:

  Gas-diesel (GD) engines (High pressure gas injection, possibility of combusting different liquid (pure liquid mode) or gaseous fuels (with a liquid pilot) or at different mixtures of both (liquid /gaseous) (in gas mode) fuels i.e. associated gases can be utilized. GD is operating according to the diesel cycle.)
  Dual-fuel (DF) engines (Low pressure gas injection, possibility of running either in pure liquid mode (operates according to diesel cycle) or in gas mode (operating according to the Otto cycle with ignition by a small amount of diesel pilot injection)).

- **Article 3**: Emergency gensets should be added to the list of exceptions. According to law, emergency engines have to be checked regularly and in this context test runs and testing is required. This testing should also be exempted from strict emission limit values. Emergency engines should not be equipped with secondary abatement techniques, as this increases the risk that the emergency genset will not function properly in its crucial, potentially lifesaving, function when necessary.[5]

- **Article 8**: EUROMOT recommends exchanging the word "gas" in front of "gas engines" by "stationary reciprocating" in order to make it clear that reference point is 15 % O2 for gas and liquid fired engine plants.

- **Article 7, IV:** The question of how to treat different loads of combustion plants are also being discussed in the current review of the Large Combustion Plants Best Available Techniques Reference Document (LCP BREF). For this reason EUROMOT recommends waiting for the outcome of the current LCP BREF review before setting any such requirements. This would allow France to adopt a European approach in future. Instead a requirement could be inserted that if the plant is constantly during excessive times operating below 70 % of rated capacity the plant operator/owner has to fulfil this emission limit in order to avoid "frauds" of the lower threshold and in order not to have to fulfil any emission limits.

Article 11, I:

- **Article 11, I, New plants** page 15-16. Stricter NOx limits are proposed for existing plants than for new plants proposed (please compare with part II). It is EUROMOT's understanding that the two tables have been swapped by mistake. In the following comments EUROMOT has taken this into account.

- **Article 11, I:** EUROMOT understands the term "Fioul domestique" to mean light fuel oil (LFO < 0.1 wt-% S) and "Autres combustibles liquids" to refer to liquid bio fuel or HFO. For sake of clarity this should be clearly stated.

[5] See Annex II for a typical SCR heat up in following Euromot Position paper: http://www.euromot.org/download/ce243a5b-ed8f-4fea-a9cb-06ebe1205dc9/EU%20IED%20start-up%20-%20shut-down%20definition%202011-09-13.pdf

- **Article 11, I** "Fioul domestique" and "Autres combustibles liquids": Internal combustion engines will have to use SCR to comply with the low NOx emission limit values proposed regardless of whether it is a 20 MWth power plant or a large plant bigger than 300 MWth. Particularly for smaller plants below 50 MWth the proposal will be a big burden as reagent consumption is a big cost with a SCR and reagent consumption will increase with lower limits. The cost analysis[6] prepared by EGTEI for the LRTAP Convention shows the high costs of SCR usage which are mainly due to reagent cost. This becomes especially clear when considering the additional cost calculated in Euro/MWhe.

  EUROMOT therefore urges France to reconsider the low NOx emission limit values and to consider maintaining the current already comparatively strict emission limits for plants below 50 MWth in this review of French legislation.

- **Article 11, I "Autres combustibles liquids"**: In order to comply with the proposed SO2 emission limit value of 275 mg/Nm3 (15 % O2) the HFO can have a maximum sulphur content of 0.47 wt-% Sulphur.

  EUROMOT strongly recommends aligning with common international fuel grades:

  - In continental Europe the SO2 emission limit values should be set at 300 mg/Nm3 at 15 % O2 in order to align with HFO fuel with a maximum sulphur content of 0.5 wt-% S.
  - In the territories outside continental Europe, this fuel quality may not be available. Therefore, EUROMOT recommends setting an emission limit value of 590 mg/Nm3 at15 % O2 for the overseas territories which corresponds with a maximum sulphur content in HFO of 1.0 wt-% S – a fuel quality more common in remote areas[7].

- **Article 11, I "Dust":** The French Overseas Territories need a higher emission limit value for PM due to the available HFO quality found in these regions. ESP is needed to comply with the strict PM value. This would involve high costs for existing plant and in many cases problems with space availability will exist. EUROMOT recommends following emission limit values
  - For HFO a slightly higher limit than the proposed 40 mg/m3 at 15% O2 is needed to avoid the need of installing ESP: 50 mg/Nm3 at 15 % O2 in the Overseas Territories. For large stationary engine plants, this emission limit value is BAT (Best Available Technique) according to the EU LCP BREF[8]. Please also note the engine loading specified in the LCP BREF.
  - LFO: The proposed PM limit of 30 mg/Nm3 at 15 % O2 in all areas is achievable and in line with the LCP BREF[9]

- **Article 11, I "Gaz naturel":**
  - The SO2 and PM limits should be deleted. Stationary engine plants running on natural gas emit very little SO2 and PM and requiring the measurement of these emissions would be an unnecessary burden on operators. This would also be in line with the IED as the IED does not set any emission limit values for

[6] http://www.unece.org/fileadmin/DAM/env/documents/2011/eb/wg5/WGSR49/Informal%20docs/17_EGTEI-Cost-stationary-engines-UNECE-06-04-2011.pdf

[7] According to EU Directive 1999/32/EC at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1999:121:0013:0018:EN:PDF the maximum allowed S-content of HFO for plants not regulated by the EU LCPD is 1.00 wt-%.

[8] LCP BREF Table 6.47 on page 405 http://eippcb.jrc.es/reference/BREF/lcp_bref_0706.pdf

[9] LCP BREF Table 6.47 on page 405 http://eippcb.jrc.es/reference/BREF/lcp_bref_0706.pdf

SO2 and PM for gaseous fuel. In order to ensure that a low level emission levels, natural gas suppliers should be required to fulfil strict gas specification ensuring a high gas quality.

- NOx limits for engine plants below 50 MWth should remain at the current limit. This is important as currently the European Commission and CEN TC 234 WG 11 are discussing future lower gas qualities. These lower gas qualities are likely to increase NOx emissions from combustion plants[10].

- A small plant has very different possibilities than big plants for investments and operations of abatement techniques (skilled personnel present or not, etc.). The NOx emission limit values for existing plants >= 50 MWth is at 100 mg/Nm3 at 15 % O2 in line with the IED. The proposed emission limit value of 75 mg at 15% O2 would make it necessary to install SCR in all new spark-ignited and gas-diesel engine plants. A SG type engine can be tuned to 100 mg/Nm3 (15 % O2) but at the expense of higher fuel consumption and corresponding higher CO2 emissions as well as higher CO, NMHC, formaldehyde emissions. Furthermore, the lower flue gas temperature is negative for CHP and for oxicat emission reduction).

- Smaller dual fuel and gas diesel engine types below 50 MWth will also have to install SCR for compliance with the 130 mg/m3 at 15 % O2 proposed for new plants. For dual fuel engines, EUROMOT recommends maintaining the current 190 mg/m3 at 15% NOx limit which is achievable without SCR.

- **Article 11, I "Autres combustibles gazeux":** The IED does not have separate rules for other gas fuels. EUROMOT therefore recommends following the approach outlined for natural gas, except regarding CO. For CO a different approach is needed as oxidation catalysts are sensitive to impurities in the flue gas. Therefore we recommend a CO emission limit value of 250 mg/Nm3 at 15 % O2 for all sizes.

- **Article 11, I engine plants operating less than 500 hr/year:** Engine plants will require SCR to be compliant with the proposed NOx limit of 450 mg/Nm3 at 15 % O2). Engine plants with less than 500 operating hours per year, especially when running intermittently or at variable load below70% nominal power, should not be required to use SCR. A SCR will not function cold and typically it can take up to 30 minutes before the SCR is heated up enough.[11] Emergency engines should not be equipped with secondary abatement techniques, as this increases the risk that it will not function in its crucial, potentially lifesaving, function when necessary[12]. Therefore the emission limit values achievable with the best primary methods should be used[13].
  - EUROMOT recommends an emission limit value of 1500 mg/m3. At a later stage this value could be aligned to the revised Gothenburg Protocol which is not yet in force:
    - Bore < 400mm: 1300 mg/Nm3 NOx at 15 % O2
    - Bore >= 400 mm: 1850 mg/Nm§ NOx at 15% O2

[10] See e.g. http://www.euromot.org/download/44105f7a-c832-4dac-ad8b-4829231aac1d/UNECE%20Gothenburg%20Dual%20Fuel%20Engines%20WGSR49%202011-08-15.pdf for more information
[11] For example with LFO a minimum of 320 degree C temperature is needed. For low sulphur HFO minimum 340 degree C for a properly functioning SCR is needed in order to avoid clogging of ammoniumbisulfate
[12] See e.., Annex II for a typical SCR heat up in Euromot Position paper at http://www.euromot.org/download/ce243a5b-ed8f-4fea-a9cb-06ebe1205dc9/EU%20IED%20start-up%20-%20shut-down%20definition%202011-09-13.pdf
[13] Gothenburgh Protocol Annex V at http://www.unece.org/fileadmin/DAM/env/documents/2012/EB/ECE_EB_AIR_2012_7_E.pdf flexibility b) page 7 – 8 emissions

- However this is not suitable for existing medium speed engine. We propose following “BAT” limits for existing plants:
  - 1460 mg/Nm3 (15 % O2) NOx can be reached, bore < 400 mm (to be checked with engine supplier, if possible on older engines or not)
  - 1850 – 2000 mg/Nm3 (15 % O2) NOx can be reached, bore >= 400 mm (to be checked with engine supplier, if possible on older engines or not)

- **Article 11, I (3) Engine operating for less than 500 hours per year or engine using gas fuel making use of a pilot fuel injection system (dual fuel engine), natural gas plants in the range of 20-50 MWth:** This means that a SCR is mandatory. As commented above this is not recommended for emergency use. EUROMOT recommends applying following limits:
  - In gas mode the NOx limit for dual fuel to be at least 190 mg/Nm3 (15 % O2).
  - For Gas diesel in gas mode: The same limits as for liquid fired engines should be applied.

  Please add gas diesel (GD) to the emission table with a specific emission limit as this is a different engine technique separate from spark-ignited and dual fuel.

Article 11, II:

- Stricter NOx limits are proposed for existing plants than for new plants proposed (please compare with part I). It is EUROMOT’s understanding that the two tables have been swapped by mistake. In the following comments EUROMOT has taken this into account.

- **Article 11, II NOx emission limit values for liquid fuels:** In order to comply with the new emission limit value for diesel plants a SCR is needed. For plants below 50 MWth EUROMOT recommends a stepwise approach to achieve these very low limits

- **Article 11, II “Autres combustibles liquids”**: In order to comply with the proposed SO2 emission limit value of 275 mg/Nm3 (15 % O2) the HFO can have a maximum sulphur content of 0.47 % Sulphur.

  EUROMOT strongly recommends aligning with common international fuel grades:
  - In continental Europe the SO2 emission limit values should be set at 300 mg/Nm3 at 15 % O2 in order to align with HFO fuel with a maximum sulphur content of 0.5 wt-% S.
  - In the overseas territories outside continental Europe, this fuel quality may not be available. Therefore, EUROMOT recommends setting an emission limit value of 590 mg/Nm3 at 15 % O2 for the territories which corresponds with a maximum sulphur content in HFO of 1.0 wt-% S – a fuel quality more common in remote areas[14].

- **Article 11, II ”Dust”:** The French Overseas Territories need a higher emission limit value for PM due to the available HFO quality found in these regions. ESP is needed to comply with the strict PM value. This would involve high costs for existing plant and in

[14] According to EU Directive 1999/32/EC at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1999:121:0013:0018:EN:PDF the maximum allowed S-content of HFO for plants not regulated by the EU LCPD is 1.00 wt-%.

many cases problems with space availability will exist. EUROMOT recommends following emission limit values:

- For HFO: 50 mg/Nm3 at 15 % O2 in the Overseas Territories. For large stationary engine plants, this emission limit value is BAT (Best Available Technique) according to the EU LCP BREF[15].
- LFO: The PM limit should be raised to 30 mg/Nm3 at 15 % O2 in all areas. This emission limit value represents BAT for LFO according to the LCP BREF[16]

- **Article 11, II "Gaz naturel":** The SO2 and PM limits should be deleted. Stationary engine plants running on natural gas emit very little SO2 and PM and requiring the measurement of these emissions would be an unnecessary burden on operators. This would also be in line with the IED as the IED does not set any emission limit values for SO2 and PM for gaseous fuel.

- **Article 11, II NOx:** For dual fuel engine plants below 50 MWth Euromot recommends following NOx emission limit values for dual fuel engine as the currently proposed emission limit values would make SCR installation necessary:
  - For low pressure dual fuel engines operating on good quality gas (methane number above 80): 190 mg/Nm3 at 15 % O2. This is the emission limit value already proposed for existing dual fuel engines. This value should not only apply to existing but also to new dual fuel engine plants.
  - For low pressure dual fuel engines operating on other gas quality: 380 mg/Nm3 at 15 % O2), which is the current limit (see also above Euromot Position paper link)
  - For high pressure gas-diesel engines the same limits as for diesel engines should apply.

- **Article 11, II "Autres combustibles gazeux":** The IED does not have separate rules for other gas fuels. EUROMOT therefore recommends following the approach outlined for natural gas, except regarding CO. For CO a different approach is needed as oxidation catalysts are sensitive to impurities in the flue gas. Therefore we recommend a CO emission limit value of 250 mg/Nm3 at 15 % O2 for all sizes.

- **Article 11, II (3) Engine operating for less than 500 hours per year or engine using gas fuel making use of a pilot fuel injection system (dual fuel engine):** For a low pressure gas DF engine type this is achievable with a good gas quality. For DF engines running on other gases, EUROMOT recommends applying the NOx-limit of 375 mg/Nm3 at 15 % O2. For high pressure gas diesel (GD) in gas mode EUROMOT recommends applying the same limits as for diesel engines.

- Please add gas engine types as in present ruling SG, DF and (add) GD to the emission table with a specific emission limits. These are different engine techniques and today's trend is technique specific emission limits!

- **Article 11, II (4):** This NOx emission limit value is technically achievable for existing spark-ignited gas engines. A low pressure gas DF engine operating on good quality gas can achieve this but for gas quality with a methane number lower than 80 the higher emission limit value of 375 mg/Nm3 at 15 % O2 is needed. A gas fired GD gas fired engine should be treated as a diesel engine.

[15] LCP BREF Table 6.47 on page 405 http://eippcb.jrc.es/reference/BREF/lcp_bref_0706.pdf
[16] LCP BREF Table 6.47 on page 405 http://eippcb.jrc.es/reference/BREF/lcp_bref_0706.pdf

- **Article12, III: VOC (NMHC) and formaldehyde limits:** In the consultation meeting, the internal combustion engine industry has shown that a NMVOC limit of 150 mg/Nm3 at 15 % O2 is not achievable with certain natural gas qualities containing high portions of ethane and propane, e.g. Troll or Algerian. The Large Combustion Plants BREF considers a formaldehyde limit of 23 mg/Nm3 at 15 % O2 to be a sufficient surrogate for hydrocarbon emission[17]. Some member states including Germany already follow this approach.

  EUROMOT urges France to set hydrocarbon emission limit values which are achievable with current best available technique while at the same time taking into account different existing gas qualities. EUROMOT recommends focussing on setting a formaldehyde emission limit value as a surrogate for hydrocarbon emission.

- **Article 17:** The former Directive 2001/80/EC does not cover internal combustion engines neither does Directive 2008/1/EC. Clarification is needed regarding the treatment of internal combustion engines.

- **Article 22:** The rule regarding minimum stack height seems unnecessarily complicated. EURMOT proposes aligning the rules for plants below 50 MWth input to the IFC approach [18]

- **Article 24:** HFO users should have the option to follow the sulphur content and no need of measurements as allowed according to IED if FGD not used.

- **Article 27:** The CO measurement in stationary RICE plant < 100 MW once every three months is too frequent. EUROMOT recommends prolonging this twice a year in order to avoid excessive measurement costs.

- **Article 37:** To be stated that the measurement result is an average of the measurement series

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[17] See LCP BREF, chapter 7.5.4 page 480 last paragraph http://eippcb.jrc.es/reference/BREF/lcp_bref_0706.pdf
[18] IFC is part of the World Bank Group. Please GIIP or GEP page 16 for further details: http://www1.ifc.org/wps/wcm/connect/532ff4804886583ab4d6f66a6515bb18/1-1%2BAir%2BEmissions%2Band%2BAmbient%2BAir%2BQuality.pdf?MOD=AJPERES

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