



MCPD Transition Team

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Response to: Consultation on reducing emissions from Medium Combustion Plants and Generators to improve air quality: consultation document

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Uniper is an experienced international energy company focused on power generation, energy trading, transportation, and storage, as well as a provider of specialist power engineering services. In the UK we own seven power stations comprising over 6GW of flexible installed capacity, as well as Holford gas storage site. As such Uniper is the fifth largest generator in the UK. Our employees, our experience and our assets make us a well-established business that makes an important, tangible contribution to Britain's security of supply and contributes to a cost-effective transition to a low carbon society.

We are pleased to take part in the consultation process. Our views in summary:

Compliance with the environmental standards set out in the Medium Combustion Plant Directive (MCPD) is achievable and improvement in air quality is paramount, therefore the grounds for any exemptions or flexibility must be rigorously challenged:

- inconsistent application of environmental standards skews the market in the favour of those who do not meet the costs to comply and therefore facilitates the growth of more polluting technologies / operators;
- certain special arrangements, as proposed, allow new build to meet lower standards than existing plant;
- allowing planning applications, in which impacts have been assessed on the basis of limited annual operating hours, to proceed without any such restrictions, reporting requirements or, monitoring, is poor regulation and opens the door to uncontrolled emissions adversely impacting local air quality: and
- effective abatement technology to meet the MCPD emission standards is available and proven;

Uniper has a number of plants that would be subject to the requirements of MCPD and we understand the challenges that compliance will bring. However we would like to see environmental standards consistently applied and enforced. This will ensure that plant are treated consistently regardless of the side of the installation boundary they are located.



Uniper supports the transition to a low carbon economy and the development of a regulatory framework to improve air quality standards. Environmental standards should be applied consistently and appropriately across all technologies, sizes and types ensuring that emissions are reduced and electricity generation is procured on an equivalent basis. We have seen the recent increase in diesel engine arrays where gaps in environmental regulation allow generation costs to be minimised, providing a competitive advantage.

Currently the UK Government is consulting on phasing out coal-fired power generation by 2025 for environmental reasons. Therefore, it is important that DEFRA ensures that the transposition of Medium Combustion Plant (MCPD) prevents coal being replaced with more polluting technologies and facilitates investment in new build plant which delivers a reduction in UK emissions.

Air quality is one of the biggest challenges facing the UK. Air pollution is linked to the early deaths of around 40,000 people a year in the UK¹. The UK currently exceeds the annual mean NO₂ objective across the majority of designated zones. Recent government projections (submitted under the Convention on Long-Range Transboundary Air Pollution) indicate UK compliance with the National Emissions Ceiling Directive² (NECD) mandated 2020 target for oxides of nitrogen, (NO_x) look marginal. It is therefore important to prevent further upward pressure arising from NO_x emissions associated with the rapid growth of liquid and gas fuelled reciprocating engines seeking to operate in the energy and capacity market in coming years. Plant should not be able to continue to operate without meeting environmental performance standards comparable with those required of the larger plant that it displaces. The NO_x performance of gas reciprocating engines is better than diesel but still well below that of gas fired CCGTs.

Operators who entered into Capacity Market Agreements for a 15 year period in 2014 and 2015 would reasonably be expected to foresee some regulation change over that time. The European Commission draft of the MCPD was published in December 2013 and much of the detailed requirements on existing and new plant were known prior to final publication. Operators of Large Combustion plant have over the last 15 years been subject to many changes in legislation, with no "Grandfathering" applied regardless of contracts or agreements. This is true for other industries including waste, refineries, and steel manufacturing. Therefore, this effectively places two sets of rules or regulations on otherwise similar businesses, which will create unfair competitive advantages for grandfathered companies.

Operation solely for testing may be worthy of special treatment however testing at peak periods to offset costs is commercial operation and should be treated as such. Operators of back up plant should not be at an unfair commercial advantage to other operators who have invested to meet compliance with environmental legislation. Plant competing in the same markets should do so on consistent terms.

Small scale generators such as reciprocating engines tend to run at periods of peak electricity demand, generally winter evenings, coinciding with traffic peaks and pollutant trapping weather conditions. This consultation comes at a time when many cities in the UK are experiencing continued poor air quality due to high emissions. At a time when the auto industry is under renewed pressure to improve standards by reducing NO_x emissions and Local Authorities in our largest cities are considering restricting access to diesel vehicles, DEFRA should not allow unchecked

¹ Royal College of Physicians report February 2016: Every breath we take the lifelong impact of air pollution.

² <http://www.unece.org/environmental-policy/conventions/envlrtapwelcome/guidance-documents-and-other-methodological-materials/gothenburg-protocol.html>

growth of polluting diesel fuelled generation plant. Every 1GW of diesel engines is approximately equivalent to an additional half a million diesel cars on the road³.

Our review of recent planning applications⁴, has shown there are usually no constraints on running even when the operator has assessed impacts based on limited operating hours. There are no requirements to monitor operating hours or emissions. It is essential therefore, as a minimum, to see strict assessment of environmental impacts and mitigating measures through the current planning process and retrospective action taken when this has been neglected.

We want to see smaller generators competing alongside other technologies on a level playing field to provide the energy services required for the UK. However, this must be on a consistent basis that takes the UK towards a cleaner, reliable low carbon energy supply.

Response to Consultation Questions

Q1. Do you agree with the general approach to permitting that is proposed?

We support the general approach of using the Environmental Permitting regulations. We believe it is essential that regulatory clarity is provided on the regulation of MCPs on sites subject to the Industrial Emissions Directive (IED) as these are potentially subject to double regulation.

The Environment Agency (EA) has produced draft regulatory guidance for plant operating in the balancing market with IED permits with an emphasis on energy efficiency⁵. The EA have proposed that this guidance is extended to include plant within the MCPD size range. If taken forward, this proposal would set stricter standards for plant within the MCPD range that operates on IED regulated sites simply by virtue of it being inside the site boundary. We do not agree with this inconsistency in approach; MCPD should set the compliance requirements for plant that is permitted under IED but not subject to the Large Combustion Plant BREF.

Q2. Do you agree with the proposed approaches set out in Table 1? If not, why not?

We do not agree with proposal to increase the NO_x emission limits value (ELV) for new engines operating between 500-1500 hours (Table 1 flexibility option 9) provided they are applying primary abatement measures. It would be illogical to set less stringent limits for new engines than those applicable to existing engines. This would allow increased NO_x emissions of over 1000 mg/Nm³ for some new diesel engines, whereas existing diesel engines operating > 500 hours per year cannot emit more than 250mg/Nm³. Using the information presented within the AQMAU modelling report accompanying this consultation, it can be shown there could be a substantial air quality risk associated with the proposed flexibility.

Investment in new build plant should lead to an improvement in emissions, rather than significant deterioration. The MCPD regulations should be applied to ensure that replacement generation is cleaner than older technology thereby helping the UK meet its obligations under the Gothenburg Protocol, the NECD and the Ambient Air Quality Directive⁶.

³ Supporting information vehicle comparison calculation

⁴ Taken from planning applications submitted to local authorities submitted in 2015 and held on local authority websites

⁵ Regulatory Guidance for regulating Part A(1)>50MWth gas and liquid fuel fired combustion plants operating for <1500hours pa under the Industrial Emissions Directive – in draft

⁶ <http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32008L0050>

Q3. What are the practical problems with applying the 3-year and 5-year rolling averages? Should a yearly maximum be applied?

The application of rolling averages introduces a number of risks, as operators may operate without meeting any emission standards for up to 2500 hours (existing plant) and 1500 hours (new plant) in any year. Yet still meet the 500 hours limit as an average over the 3-year or 5-year period. It would be unreasonable to allow the entire 2500 hours (allowed under the 5 year average) to be used in any single individual year as this could clearly result in an immediate adverse impact on local air quality.

Our emissions performance review has shown that liquid fuel reciprocating engines without secondary abatement can have NO_x emissions per MWhr significantly greater than the best performing, high efficiency new and existing CCGTs. Natural gas fired reciprocating engines are also substantially higher NO_x emitters than natural gas fired gas turbine (GT) plant⁷.

An approach that limits the impact on air quality would be to apply the 500 hour derogation without the rolling average as the default position, but require plants which wish to take advantage of the flexibility to demonstrate no adverse effects on air quality under their proposed maximum potential annual operation. This approach would be in line with other comparative legislative requirements such as the Industrial Emissions Directive and ensure a level playing field with other operators. Under the IED, large combustion plants are only excluded from ELV compliance where operation is limited to 500 hours per year, with no rolling average applied. Large combustion plant that wishes to operate for 1500 hours as a rolling average over a 5 year period still has to comply with emission limits.

If the principle of a rolling average is to be implemented then it is very important a balance is achieved which allows sufficient but not excessive flexibility, while protecting air quality. In practice this means setting a yearly maximum on the number of operating hours that is greater than the long term rolling average, but below the total number of hours that can be operated over the averaging period. It would have to be demonstrated that operating for these additional hours would not result in a negative impact on air quality.

There is an existing precedent for managing a rolling average in practice, from the implementation by the Environment Agency of the 1500 hours derogation from the Industrial Emission Directive Annex V limits for existing plants. This precedent established that the hours limit for each individual year can be derived from two guiding rules:-

- Operation in any individual year should not exceed 1.5 times the rolling average value (750 hours for the case of a 500 hours rolling average).
- If operation has reached 1.5 times the rolling average in one year, then the average operation across the other years should not exceed 1.1 times the rolling average value (550 hours), until the 3 year or 5 year period is completed and a full rolling average (of no more than 500 hours) is established.

We do not support applying a rolling average; however the above should inform the approach if one is applied. It is important that whichever option is chosen air quality and consequently public health must be protected.

⁷ Supporting information: NO_x intensity graph

Q4. Do you have specific examples where applying the extension to exempted hours in exceptionally cold weather is justified?

We have no specific examples. However if DEFRA intends to allow this exemption then provision should be made to protect air quality, by applying a stricter exempted hours limit once the cold spell is over. The recent spell of cold weather, low wind and high emissions has resulted in a number of air quality warnings being issued by DEFRA.

Q5. For biomass and district heating plants which qualify for later application of Annex II emission limits, do you have views on how emission limits should be set which ensure that no significant pollution is caused and that a high level of protection of the environment as a whole is achieved?

Biomass plant may be derogated from the dust emission limit in MCPD if they operate less than 500 hours per year (Article 6 (8)). The dust ELV applicable under this derogation (100mg/Nm³) is higher than the IED limit for large coal plant (20mg/Nm³). In order to take advantage of this derogation, an air quality assessment should be required and the Regulator should set permit conditions accordingly to ensure that air quality is protected.

Q6. What are the practical difficulties with applying the MCPD to compression ignition engines within the MCPD size range which are not used in the propulsion of a vehicle, ship or aircraft and are not subject to 'placing on the market' emission standards under the Non-Road Mobile Machinery Directive?

We have no evidence of any practical difficulties with applying the MCPD to NRMM not subject to NRMM 2019 emission standards. We believe that this plant should be subject to MCPD to ensure that no MCP is allowed to operate without Regulation.

Existing NRMM generator engines > 560kW are not subject to emission limits under either the revised or previous NRMM and are hence currently unregulated. We support the Defra contention that existing mobile plant should be subject to the requirements of the MCPD. To ensure a level playing field and to prevent any loopholes allowing mobile plant to compete with stationary plant they should be subject to the same requirements as stationary plant, including the additional proposals to control emissions from generators. We do not see any reason for excluding mobile plant from the same regulatory requirements as stationary plants, either from a practical or air quality perspective. The MCPD standards should therefore be applied regardless of any uncertainty regarding the precise scope of the NRMM Directive in relation to existing plant within this size range.

Q7. What approach for compliance checks do you support, and why:

- a) Random compliance checks as described above*
- b) Scheduled compliance checks as described above*
- c) Other – please describe*

Whilst, we recognise the regulatory burden associated with compliance checking, we believe that emissions reporting would have multiple benefits:

- allows some level of automated checking,
- an effective deterrent to non-compliance,
- supports the compilation of UK emission inventory reporting under Gothenburg & NECD and;
- supports the collation of emissions data to meet MCPD Articles 6(10), 11, 12.



We therefore propose an alternative approach where operators are mandated to submit data following the annual or three yearly periodic emission measurements required under Annex III of the MCPD. The regulator would carry out random spot checks on the reported data and carry out site inspections if issues of concern were identified. Compliance assessment by means of emissions reporting would avoid the need for a costly, impractical and burdensome plant inspection regime, noting that, in many cases, MCP installations are unmanned.

This would ensure the best balance between operators demonstrating compliance with emission limits, operating hours, and optimising the effort required by the Regulator. This approach is consistent with the practice for sites currently regulated under EPR.

In the case of the few medium combustion plant that are fitted with abatement equipment, the report submitted to the Regulator should include any failures of abatement equipment (total duration and the number of failures) which would inform the regulator of the need for an improvement programme.

There are already automated data processes employed, or under development, by the Regulator that could be utilised for reporting. An example of this is the ETSWAP system currently employed by the all UK regulators for compliance with EUETS permits.

To ensure that this process is providing sufficient feedback on emissions and is not overly onerous DEFRA should schedule a review of the arrangements after the first three years, once there is some experience of the new regime.

Q8. Do you agree with the proposed approach for monitoring of plants? If not, what are your concerns?

We believe that the approach set out is reasonable and proportionate. However, further guidance regarding plant operation at the time of testing is required. In particular, provision should be made for plant that operates limited hours to ensure plant is not run just to carry out monitoring.

In the situation where abatement equipment is employed to ensure compliance with emission limits then the operator should be required, at registration, to propose how they will demonstrate that: i) the abatement equipment continues to operate effectively; ii) a system is in place to record the frequency and duration of abatement failures and iii) records of malfunction will be held on site for inspection. There could be generic requirements and guidance depending on plant category and size, e.g., full MCERTS monitoring requirements and full mandatory continuous monitoring for units identified as high risk in relation to air quality impacts. It could also be a standard requirement to install a continuous indicative dust monitor for all solid fuel fired appliances and for all diesel engines to be fitted with particulate filters. Similarly it should be a requirement to install process monitors for the continuous indicative measurement of NO_x and/or SO₂ when these species are abated, noting that it would not be reasonable or proportionate to require full MCERTS calibration of these process monitors.

Q9. Do you have any suggestions for monitoring methods which could be applied to MCPs as an alternative to MCERTs?

MCERTS is a long established Monitoring Certification Scheme that helps ensure compliance with European Directives and the production of reliable data. MCERTS achieves this by specifying the use of certified monitoring equipment, suitable test standards, trained and competent personnel. While we accept MCERTS may not be appropriate for all plant subject to MCPD, any alternative should provide the same level of assurance. The public and Government needs to be confident that data provided by sites is accurate and of a high standard.

As noted in our response to Q7, this would enable compliance to be assessed based on a reported emission rather than a costly and burdensome plant inspection regime.

In relation to Table 2 of the consultation document, that lists the minimum monitoring requirements differing monitoring requirements for plant that operate for a reduced number of operating hours is potentially confusing and may result in a greater environmental impact. The same set of monitoring and reporting requirements should therefore apply to all plant of a given type.

For example, most of the cost of monitoring is associated with the mobilisation of the test or service personnel to measure CO. A simultaneous NO_x measurement is no more expensive and provides useful information. If NO_x is not measured, it provides an incentive to tune the engine for the lowest CO (highest NO_x) with no regard to air quality impacts. More generally, there should also be measures in place to avoid tuning of the engine prior to NO_x test point and then re-tuning to give high NO_x, and low CO, prior to the CO test point (which would give high NO_x for ongoing operation of the engine).

For plant with limited operating hours, monitoring is required very infrequently and it is not unreasonable to expect monitoring to be conducted for the same species, and to the same standards, as required for other plant. This will make it simpler to specify and implement the requirements.

We believe the requirements for monitoring methods should be developed by industry experts through the existing Defra MCPD monitoring sub-group. The UK should also collaborate with EU partners in terms of developing these approaches to ensure they are recognised as compliant with the requirements of MCPD Annex III Part 1, point 7.

EMISSIONS FROM GENERATORS

Q10. Do you agree with the proposed definition of “generators”? If not please explain your reasons and propose an alternative definition.

MCPD plant on IED sites

In the case of plant within the MCPD size range situated on IED regulated sites, we would propose for consistency and to avoid conferring a competitive advantage, these plants should be subject to the same standard requirements as medium combustion plant not located on IED sites.

However as identified in our answer to question one, this approach would only be practical if the EA’s proposed guidance on Best Available Techniques for “balancing plant” operating for <1500 hours per year are not applied to such plant. The most straightforward way to implement the same requirements is to provide guidance, to regulators of IED sites, that this category (of MCP generation plant on IED regulated sites and subject only to Chapter II of the IED) should be subject to the combination of:

- the applicable limits specified under the MCPD for that size and technology, and
- the emission controls for generators, where applicable.

For MCP plants that are not generators and are subject to Chapter II of the IED only, the guidance should apply the applicable limits specified under the MCPD.

Aggregation

We are of the opinion the aggregation rule should be applied for the definition of a single generator in reference to the proposed regulation of generators, including aggregation of sub-1MWth units, as (i) from an air quality perspective, the impacts from arrays are on an aggregated basis and (ii) the risk mitigation approach set out is based on AQMAU modelling which aggregates generator units. However, the precise meaning of at the 'same site' and 'for the same purpose' needs defining, to provide regulatory clarity.

In addition, either the definition or guidance should specify that a generator that qualifies as an MCP in its own right (i.e. is >1MWth itself, applying the aggregation rules in the MCPD) should be regulated as a single plant, rather than included in any grouping. This could be achieved by amending the definition as follows:

"The term generator applies to:

- any single stationary electricity generating plant with a thermal input of between 1 and 50MWth or;
- any single stationary electricity generating plant within a group of stationary electricity generating plant located at the same site and providing electricity for the same purpose where the aggregated thermal input of that group of plants is between 1 and 50MWth.

For sites where the aggregated thermal rating of the generators is 5MWth or greater, the standard requirements for Tranche A generators will apply from 2025."

Mobile Plant

We are concerned that the terms "mobile plant" and "stationary plant" are not clearly defined in the consultation document. This lack of a clear definition could provide a potential loophole where operators use mobile plant in one place for a significant amount of time generating electricity to supply the grid, while at the same time avoiding the controls on emission for generators simply by the virtue of being classified as a 'mobile' plant.

There are a number of complexities associated with the definition of mobile plant and the range of scenarios in which they may be operating. We believe that it would be more practical to deal with this through separate guidance drawn up by the regulator with input from operators and we would be happy to provide input. Two important issues which should be addressed through the guidance are:

- mobile generation plant with commercial contracts to provide capacity or electricity should not be subject to less stringent emission standards than the equivalent permanent plant
- There should be a clear demarcation of who has responsibility for compliance with the MCPD or NRMM for plant that has been brought onto industrial sites temporarily.

In relation to the second point above, a possible solution is to follow the well-established process for mobile plant used to treat waste. It would be the responsibility of the unit provider to ensure the equipment meets the requirements of MCPD and the organisation hiring the equipment should be able to obtain proof of this from the hiring company. When the plant is deployed to an area a deployment form is completed which sets out the location where the plant will be used and the duration it will be used for. This form is then submitted to the local area regulator who would apply any additional local restrictions that may be required for air quality, noise etc.

Q11. Do you agree with the emissions limits proposed and that where secondary abatement is applied it must abate emissions to the required Emission Limit Value within five minutes?



We support the principle that the emission level should be delivered promptly within the period of operation, particularly given that some generator plant may be operating for relatively short durations. We believe that this principle should be consistently applied (i.e. it should not be specific to plant using secondary abatement).

Controlling NO_x emissions from small scale diesel fired engines is important to ensure the UK meets its obligations under the Gothenburg protocol and NECD. The NO_x ELV standard of 190mg/Nm³ should be the minimum compliance requirement for generators. A review of information available from engine suppliers indicates that this emission performance can be achieved by unabated gas plant and abated diesel plant.

The UK Government has a desire to close out coal-fired power generation by 2025 and it is important to ensure that new technology is cleaner than the technology it replaces; therefore MCPD transposition and the accompanying proposals for generators should prevent coal being replaced with more polluting generation. The NO_x intensity of a reciprocating engine fuelled with diesel or biodiesel is greater per MWh of electricity generated than a coal fired power station with Selective Catalytic Reduction (SCR) technology.

Technology is available that allows small scale generators such as reciprocating engines to reduce their NO_x emissions; however the 5 minute time limit needs further development as DEFRA admit there is no basis for this time limit. Therefore further discussion between DEFRA, generator and abatement equipment manufacturers should be undertaken on secondary abatement and the timescales for reaching the required emission performance established. Given these plant may be operating for short duration, it is important that the emission level should be delivered promptly within the period of operation.

Conventional NO_x SCR catalysts for small plant applications have restrictions on the rate of temperature increase when heating from cold due to the risk of damage to the ceramic catalyst substrate; however, there are alternative catalysts using metal substrates which may suit this application. Automotive catalysts designed to withstand very high thermal transients without damage, and to deliver abatement of exhaust emissions quickly, have been in use for many years. Euro VI compliant truck diesel engines emit approximately one quarter of the NO_x emissions of their stationary counterparts, demonstrating what is achievable⁸.

An alternative to a metallic substrate based catalyst would, for example, be pre-heating of the SCR thereby ensuring that it is available within the shortest time possible. Diesel reciprocating engines that are able to start quickly have engine block pre-heating to ensure a rapid response. Therefore, integrating the design of the catalysts with the preheating arrangement may be feasible and warrants further investigation. System suppliers may also develop alternative approaches when the requirements are clearly defined.

We have experience of larger scale dual fuelled reciprocating engines fitted with SCR being able to achieve emissions of 115mg/m³ (15% O₂) within 15 minutes of start-up, and where no special pre-heating or other arrangements were made to achieve this. It is reasonable to assume that well engineered smaller plant could achieve substantially faster abatement.

⁸ Supporting information: Comparison of emission standards for diesel engines



It is important that compliance with the standard requirements is not seen as negating the need to assess the impacts on local air quality, particularly for larger plant and generator arrays. We therefore propose that demonstration of air quality compliance should be a mandatory part of the standard requirement for generator plant, allowing the regulator to set site-specific permit conditions to safeguard air quality where appropriate.

Q12. Do you agree with the proposed timescales for implementation, which reflect those specified in the Medium Combustion Plant Directive?

We strongly disagree with the proposal that generators who operate for a CM contract only, Short Term Operating Reserve contract only, or Firm Frequency Response only will not be required to apply the standard requirements or any additional requirements to safeguard local air quality until the date the contract/agreement expires.

The existence or otherwise of a pre-existing supply contract or agreement does not exempt operators from compliance with environmental legislation. Where these contracts are of a long duration, the requirement to upgrade plant performance on this timescale is a risk which operators would have taken into account at the project scoping stage. In relation to 15 year capacity market agreement, the 15 year duration is not mandated, but represents a maximum agreement length; hence developers were under no obligation to enter into such long contracts, doing so solely for financial, rather than technical or environmental reasons.

Developers have taken advantage of financial arrangements such as the Enterprise Investment Scheme designed to help small, higher-risk trading companies who invest in generation from reciprocating engines and similar. These type of investments have a short payback period; therefore expenditure to meet additional environmental legislation should not impact a companies ability to meet market expectations.

Large Combustion Plant has been subject to increasingly tightening regulation at both a National and European level for many years and is legally obliged to meet these requirements regardless of existing contracts. We are aware of no precedent in environmental regulation where the existence of commercial contracts exempts a plant from meeting the same environmental requirements as equivalent plant without such contracts.

On this basis, the standard requirements should be applied to existing plant from 2025 and 2030 without exception and regardless of the existence of a binding contract or agreement. In addition where warranted, to protect air quality, stricter standards should be applied, noting that the MCPD (Article 6 (9)) includes provision for stricter limits to be applied in areas where air quality limits are exceeded. Such provisions would be delivered by including the demonstration of air quality compliance as a mandatory part of the standard requirement for generator plant, as proposed in our answer to question 11.

Uniper believes the controls on emissions from generators should be set from 20 December 2018, rather than 1 January 2019 to be consistent with the date from which new plant must comply with the MCPD regulations. This will provide greater regulatory clarity to companies. The requirement to apply the standard regulations from 2025 and 2030, in line with the MCPD requirements, seems reasonable, again noting that this will effectively bring forward the compliance date for some sub 5MWth plant from 2030 to 2025 due to aggregation under the generator definition.

We ask for the implementation of robust environmental legislation applied appropriately to all technology types and sizes regardless of any pre-existing supply contract.



As non-abated small scale plant competes directly against large scale environmentally regulated plant in these markets a failure to enforce comparable environmental standards perpetuates existing market distortions while not leading to environmental improvements.

Q13. Do you agree that all generators with Capacity Market Agreements for new capacity from 2014/ 2015 auctions should be regulated in the same way as generators that are already operating?

There has been a substantial increase in the number of small scale generators over the last three capacity market auctions. Investment in embedded small scale generation has more recently been driven by the level of benefits available from the Network charging structure favorably skewing the economics for this plant. This distortion, combined with differences in the environmental standards applied, undermines cleaner technologies.

Non-abated diesel reciprocating engine emissions, typical of those in the 2014/15 capacity market based on information in planning applications, are more than ten times higher than those from new open cycle GT plant and more than twenty times higher than those new of CCGT plant. Natural gas fired reciprocating engines are also substantially higher NO_x emitters than GT plant.

Operators who entered into these Capacity Market Agreements did so on the basis of the information on future regulation that was available at the time. An operator entering into a 15 year agreement would be reasonably expected to foresee some regulation change over that period. Although details of the UK-specific regulation of MCP generators were not available at the time of these auctions, the detail of the MCPD was known. The Commission draft of the MCPD was published in December 2013 and much of the detailed requirements were known prior to final publication. Operators of Large Combustion plant have over the last 15 years been subject to many changes in legislation, LCPD, IED and are now subject to a third change of environmental regime - with no "Grandfathering" applied. Plant competing in the same markets should do so on consistent terms.

The UK government needs to be mindful of the potential to lock in high emissions for ten to fifteen years and set a precedent where long term contractual agreements prevent the UK from making progress in addressing air pollution and climate change.

Consequently, we believe operators who secured Capacity Market Agreements in the 2014 and 2015 auctions, but do not start operation before 20th December 2018, should be regulated in the same way as new generators. Plant that started operation prior to 20th December 2018 is already considered as operating.

Q14. Do you believe that generators with an aggregated rated thermal input <1MW (at a single site) should be required to comply with low emission limits?

We believe that if operators are providing the same services as other operators they should be treated in the same way. If operators are choosing to operate plant that is sub 1MWth and this is being aggregated with other small plant to operate in commercial markets they should be subject to the same MCPD requirements as plant greater than 1MWth. We recognise the regulatory challenge when this plant is not located on the same geographical site. However, it is possible we will see growth of small embedded plant and aggregators in the future. A potential simple rule would be that any unit wishing to participate as part of an aggregated offering should be required to meet the MCPD / generator emission standards.

Q15. Is there a case for allowing back-up generators to be tested at peak times of demand?

We believe that 50 hours for testing appears reasonable; however allowing operators to test back up plant at peak times, which enables them to use the electrical output during testing to participate in “triad avoidance” and provision of demand side response services is clearly commercial operation. It is foreseeable that some operators would take advantage of this to make commercial gain or participate in commercial markets that they may not have done previously.

This will put this type of plant in direct competition with plant that is subject to the full requirements of MCPD and may have invested in abatement equipment to meet those requirements. It is essential that all technologies compete on a level playing field to provide the services required.

We do not agree with the assumption that air quality would not be impacted by operators testing within the Triad period. Triads are the three half hour periods of peak demand on the electricity transmission network during the winter (November to February 4pm-7pm inclusive). This is the time of year when the atmospheric layers near the ground become cooler than those above them, creating a temperature inversion. When this happens pollutants emitted within these lower layers are trapped at ground level until there is a change in the weather. Allowing potentially high polluting plant with relatively low stack heights to test unrestricted in this period to participate in commercial markets may adversely impact air quality. Restrictions should be put in place for testing during this period.

It was clear from the workshops held by DEFRA in December 2016 that operators had differing views of what was considered testing. DEFRA needs to set conditions which ensure that any testing required is valid and produce clear guidance on what constitutes valid testing for back-up plant.

Q16. Do you agree with the proposed approach to controlling particulate emissions from generators?

Primary particulate emissions from diesel engines have repeatedly been implicated as having a major impact on human health and contributing to a significant number of deaths. With a typical stack height⁹ of less than six metres for a diesel or biodiesel reciprocating engine, the local impact on air quality could be significant. Consequently, it is very important that these emissions are adequately regulated. Making an air quality assessment at the planning stage a mandatory element of the standard requirement for operators should address any risks.

It is very difficult for operators to determine the appropriate level of visible emissions and there has been a move away from visual assessment towards physical measurement for this very reason. We do not believe it is practicable to carry out such visual assessments consistently and would question how this provision would be enforced.

Q17. Do you agree with the proposed exemptions from emission controls?

The proposed exemptions appear reasonable and proportionate.

As a point of clarification, the proposal wording the on p13 ‘*From 1 January 2019 and subject to the requirements of the MCPD in relation to plant that are MCPs, all generators will require a permit to operate, except...*’, could be misinterpreted if the ‘subject to the requirements of the MCPD’ element is not fully understood.

⁹ Taken from planning applications submitted to local authorities submitted in 2015 and held on local authority websites

All new MCPs will require a permit to operate from 20 Dec 2018 and existing MCPs from 1 Jan 2024 (>5-<50MWth) or 2029 (1-5MWth), regardless of whether they fall into an 'exempt' category. In particular it should be clarified that 'Back-up generators (generators operating to supply power during an on-site emergency e.g. a power cut) which are operated for the purpose of testing for no more than 50 hours per year' are not exempted from the MCPD requirement to hold a permit under the Article 2(4) exemption of testing activities from the MCPD scope. These plant require a permit by virtue of any 'non-testing' emergency back-up running.

Similarly generators on nuclear sites will need to comply with the minimum MCPD requirements and have these included within their site permit (e.g. minimum emission testing and reporting).

Q18. Do you agree that permitted generators should be required to monitor their emissions every three years only if they have adopted abatement?

This question is somewhat confusing and we assume it is 'subject to the minimum MCPD requirements' as set out on page 10 of the consultation document.

We believe that any plant which has ELVs imposed as a permit condition must be able to demonstrate compliance with that ELV and the MCPD Annex III timescales represent the appropriate approach including for generators where compliance has effectively been brought forward by these proposals and regardless of whether abatement has been adopted or not.

Q19. Do you foresee any challenges to using the Environmental Permitting Regulations for implementing the MCPD and controls on generators?

Given the large number of medium combustion plant operators who may be new to environmental regulation, there will be a significant draw on the resources of regulators in the initial phases and DEFRA needs to plan accordingly.

The implementation of MCPD, regulation of generators, cross-overs between the MCPD, IED and the NRMM will result in a need for regulatory guidance and clear compliance protocols. This strengthens the argument for one Regulatory body to oversee the production of this guidance to ensure consistency. Publication of guidance and protocols will be challenged by the UK Governments drive to reduce guidance that is held on .GOV website. Therefore, we propose a similar approach is taken to that for Large Combustion plant where guidance etc is held on a third party website e.g. trade body.

Q.20 Do you agree with this approach? [Avoiding emission conflicts and retaining Clean Air Act provisions on dark smoke and chimney height]

This seems an appropriate approach.

Q21. Which of the following approaches do you consider to be the best option for choice of the regulator:

- A) EA in England and NRW in Wales regulate plants in Part A1 installations and those where the regulator must determine the permit conditions to safeguard local air quality; LAs regulate all other plants.
- B) EA regulates all plants in England and NRW regulates all plants in Wales
- C) LAs regulate all plants



Local Authorities have shown through planning consents, (except in a small number of cases), that they do not have the relevant experience or resources to appropriately regulate these developments from an environmental perspective. Lack of experience has allowed planning permissions to be granted which impose no limits on running hours, no emission performance requirements and no requirements to monitor emissions, for large arrays of high emission plant¹⁰. We believe that if suitably resourced, the Environment Agency and NRW will be a more effective regulator for sites subject to MCPD.

These regulatory bodies have the experience and knowledge required to ensure that the regulation is enforced consistently across the UK in a sensible and pragmatic manner. As a minimum, we believe that all MCPs on Part A1 installations and all 'generators' as defined in the consultation, should be regulated by EA or NRW.

*Q23. Do you agree with the assumptions made/ evidence provided in the policy analysis and associated impact assessment e.g. number of plants, operating hours, emissions?
If not, please provide details.*

No specific comments.

¹⁰ Taken from planning applications submitted to local authorities submitted in 2015 and held on local authority websites

Supporting Information:

Vehicle comparison calculation assumptions:

- Diesel engines operate for 350 hours per year (typical value from planning application air quality assessments)
- Diesel Engine emissions 630 mg/Nm³@15%O₂
- Passenger car emissions based on 76km/h (Average free flow speed for cars on non-built up single carriageway)
- Euro 6 cars emit at 186mg/km ('real driving' emission factor used for UK emission inventory reporting based on 2.3 x Euro 6 standard of 80 mg/km – in practice emissions may be even higher)
- Typical UK annual passenger car mileage is 17230 km/year

Sources: Planning Applications; DEFRA; and Department for Transport

Comparison of emission standards for diesel engines (mg/Nm³. 15%O₂)

Source	Cited in recent planning applications	MCPD	TA Luft, 2002	NRMM (2016/1628)	EURO VI (595/2009/EC)
Applicability	For 20MW _e diesel engine arrays	Diesel engines of 1-50MW _{th} running >500 hours per year	Diesel engines >3MW _{th} running >300 hours per year	Diesel generating sets >560kW _e on non-road mobile machinery	Heavy duty vehicle engines
NO _x	630	190	186	100	56

The NRMM and EURO VI values have been converted to concentrations by assuming a specific flue gas volume of 840 Nm³/GJ at 15%O₂ for diesel combustion [VGB, 2010]. A thermal efficiency of 45% has been assumed for NRMM gensets, consistent with the upper performance end of efficiency cited for large non-mobile diesel engines, with an efficiency value of 42% assumed as the upper end performance for heavy goods vehicle (HGV) diesel engines based on literature values [Lei, 2009, National Research Council, 2012].

VGB, (2010). European Wide Sector Specific Calculation Method for Reporting to the European Pollutant Release and Transfer Register, VGB/EURELECTRIC Recommendations, 2nd Edition, June 2010.

LEI N, (2009). Diesel Engine Fuel Economy Improvement Challenges and Opportunities, Advanced Technology, Navistar, June 10th 2009, ERC Symposium.

<https://www.erc.wisc.edu/documents/symp09-Lei.pdf>

NATIONAL RESEARCH COUNCIL, (2012). Review of 21st Century Truck Partnership, Second Report, Chapter 3, Engine Systems and Fuels. <https://www.nap.edu/read/13288/chapter/5>

NO_x intensity:

NO_x intensity by Technology Type and Fuel

