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**E.ON Response to
Gas Quality Harmonisation Consultation of the European
Commission**

Consultation issued 29 July 2011

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	Consultation questions	E.ON response
1	Do you agree with the high-level conclusions of this report?	<p>E.ON disagrees with the conclusions of this report since some assumptions appear to be too far removed from the likely reality. The cost analysis seems to reflect maximum costs in all cases, but estimated costs will most likely be significantly lower in a realistic situation.</p> <p>As discussed in the response to Q3, the effects of local mitigation do not appear to have been addressed. There may be significant benefits in having a harmonised specification to allow commoditisation of natural gas and to facilitate trading (the aim of the EASEE-gas Specification). This would allow entry and trading specifications to be well known and local (distribution and delivery) specification to be tailored to local conditions and appropriate local treatment to be applied. This possibility is not apparent in the Cost Benefit Analysis.</p> <p>The report clearly states that due to increased trading it will be increasingly essential that the different gases are interchangeable. However, it is not clear how the benefits of a harmonised specification and commoditisation of natural gas have been included in the analysis.</p> <p>It is not totally clear how costs have been applied and whether these are realistic and appropriate. The following applies to gas turbines for power generation, but similar issues may occur for other categories of use.</p> <p>The costs relating to gas turbines for power generation appear to have been addressed by including a single cost for additional control of €300,000 per unit, giving a total cost for gas turbines of €750 million. A recent manufacturer's budget quote for an upgrade of a single medium sized gas turbine to accommodate fuel with a composition range similar to EASEE-gas was in excess of €10 million. Thus this cost could be a significant under-estimate.</p> <p>It also appears that ongoing costs of increased tuning/maintenance requirements and lost revenues due to increased operational problems have not been assessed.</p> <p>Although the report states that the effects of environmental constraints such as the Industrial Emissions Directive are assumed to be relevant, there appears to be no assessment of the environmental impact of changing fuel specifications.</p> <p>The report clearly states that due to increased trading it will be increasingly essential that the different gases are interchangeable. However, it is not clear what the benefits are and how they enable the utilisation equipment to operate</p>

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		safely and efficiently.
2	As a manufacturer do you maintain an inventory of installed appliances?	
3	Are there any specific gas quality related issues not recognized within this report?	<p>Yes.</p> <p>We believe that the report neglects the geographic effects of sourcing of gas for the European gas market. We believe it is possible to determine a (limited) number of areas that encounter immediate quality effects. Providing a solution for and at these points possibly allows for a financially more efficient solution that will aid the gas quality of the entire European market.</p> <p>Secondly, we believe the main issue of gas quality is high and fast fluctuations in quality (entry points of vastly different gas sources, such as certain entry points and LNG terminals), rather than the appearance of a constant stream of gas outside the acceptable quality bandwidth. The problem for end-users close to these points is not only the quality of the gas in itself, but the high speed in which the gas quality varies and the magnitude of the variations. A large jump in quality, especially without prior warning, can cause serious technical difficulties and even dangerous situations in power plants, facilities that use gas as feedstock and for other consumers. Some means of specifying the maximum rate of change of composition needs to be developed to ensure excessively rapid changes do not occur locally. In case of LNG terminals, more practical solutions may be required.</p> <p>We believe an assessment should be made to determine how many of these geographic locations exist now and in the near future and which actions are required at these points to help maintain a manageable gas quality situation throughout the grid. Analysis should be undertaken for a more targeted approach of certain locations, as this could prevent gas quality issues whilst preventing the application of costly measures throughout the EU.</p> <p>Socialization of the costs for these measures throughout Europe should be considered, to ensure these costs will not hinder the development of necessary gas sources or access points into Europe (LNG terminals, new pipelines) and</p>

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		<p>therefore possibly impact supply security.</p> <p>The report does not take into account the fact that almost all of the gas (H-Gas) transported to Europe is virtually free of sulphur and oxygen and also has very low water and hydrocarbon dew points. Gas treatment facilities to reduce these trace substances are therefore not required in most cases. Moreover, the assumption that specifically sulphur and oxygen contents will increase is not justified. The details concerning gas treatment facilities for changing Wobbe index are not clear; but it seems that a worst case scenario was used as a basis and that, as a consequence, the number of facilities indicated is also very high and not probable.</p> <p>Finally, we suggest taking into account the work done on gas quality in the Netherlands (KEMA/KIWA Report "Gas Quality for the future" (66970153-GCS 10.R.31508), as this specifically analyses the difficulties arising from different sources of gas, such as LNG, domestic and foreign production and the ability to provide localized solutions. It is a very specific and local approach, but elements are likely to be a useful contribution to the European analysis.</p>
4	Do you manufacturer appliances that can operate over the full EASEEgas specification without loss of efficiency or increase of emissions?	
5	Do you have evidence of damage or failures caused by appliance operating on gas that is not compliant with the local gas quality specification?	<p>Yes.</p> <p>This is currently difficult to identify because most appliances operate in environments with relatively stable gas compositions within current regulatory limits. However, even within current limits, operational problems and failures do occur due to variations in fuel quality.</p> <p>With regard to gas turbine operation:</p> <ul style="list-style-type: none"> • Changes in composition have resulted in emergency shutdowns. Thus resulting is significant loss of revenue and

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		<p>an adverse effect on component life and maintenance interval and cost.</p> <ul style="list-style-type: none"> • Occurrence of burner flashback, resulting in significant component damage has been linked to changes in fuel composition. • On some installations, even within current fuel quality limits, clear trends in NOx emissions are seen with changing fuel composition. Widening the fuel specification would result in increased environmental impact and in some cases may result in operational restriction due to reaching emissions permit limits. • On some installations, even within current fuel quality limits, clear trends in combustion dynamics are seen with changing fuel composition. High levels of combustion dynamics result in reduced component life, thus widening the fuel specification may result in reduced component life and thus increased maintenance costs. <p>The above problems are those which E.ON has direct evidence from currently operating gas turbines operating typically within manufacturer's specifications. It is anticipated that these would be more severe with a wider fuel delivery specification outside the manufacturer's requirements.</p>
6	Would you support the adoption of the proposed EUROMOT gas quality specification, (Appendix B)?	<p>E.ON does not support a number of elements from the EUROMOT specifications:</p> <p>The proposed Wobbe index variation of only +/-2% is set too low. The Wobbe index for H-Gas in Europe ranges from 13.6 kWh/m³ (25 °C/0 °C) for bio methane to 15.8 kWh/m³ for rich (high-calorific) LNG, i.e. a variation of +/-7%. A potential adjustment could be made at the upper end of the range, e.g. from 15.8 to 15.5 kWh/m³. The GasQual study will provide more detailed information on this. Moreover, a variation of the Wobbe index of +/-7% is not critical for most gas burners even if they are not fitted with a combustion control system. The EN 437 gives for H-Gas in Europe a range of 13.4 kWh/m³ to 16.1 kWh/m³ (0°C, 1013 mbar), which contains the range of EASEE gas specification. Appliances are developed to operate correctly, safe and with low emissions with G20 (14.9 kWh/m³), but have to fulfil less severe criteria operating with G23 (13.4 kWh/m³) and G21 (16.05 kWh/m³). So there is already a commercial need for the manufacturers to develop</p>

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		<p>appliances working within the EASEEgas specifications. The discussion between the gas industry and the appliances manufacturers is about practise of the whole range of gas qualities and the time scale. Thus, this variation seems to be more admissible from the perspective of the overall economy. A combustion control system may have to be fitted in specific cases. However, this has basically been the state of play for years.</p> <p>The range (80-100) for the methane number is set too narrow in the EURMOT specifications. High-calorific LNG has a methane number of 65 and a number pipeline gases have methane numbers in a range from 70 to 75. To increase the methane number to 80, for example, would be extremely complicated considering the large volumes of gas and involve high costs not justified by the benefit obtained as it would probably only gain an improvement of 1 to 3 percentage points in efficiency or of 10% in performance for optimised gas engines. An example from Japan, which depends entirely on LNG, shows that many gas engines have been operated in Japan for years on methane numbers even lower than 70 without any problems.</p> <p>To meet the standard of liquid motor fuels we consider a value of 10 mg/kg (approx. 8 mg/m³) of total sulphur more reasonable.</p> <p>E.ON does not see a reason why small traces of RSH (e.g. 1 or 2 mg/m³) should not be acceptable.</p> <p>A minimum pressure of 8 bar at DSO level is not acceptable for E.ON as the pressure of the distribution grid in the cities is often lower than 1 bar and these grids are not designed for operation at higher pressure. Conversion of the grids would require investments of billions of Euros, which are absolutely not justified by the benefit obtained, i.e. saving the capital expenditure to be incurred for small compressors for gas turbines and a very limited number of gas engines.</p> <p>The EURMOT specifications are not sufficient to address the aspects of influences of gas composition on underground storage facilities.</p> <p>The EURMOT Specification is specifically focused on the reciprocating gas engines and does not address the issues of other users.</p>
7	Are there any specific	As mentioned before, the cost analysis should be based on realistic scenarios. The impact on underground storage

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	circumstances that should be assessed in detail?	facilities needs to be addressed. The scenario with an overall trading/transfer specification with more restrictive local supply requirements should be considered, as should the differences in costs/benefits that occur in different scenarios with regard to socialisation of costs (i.e. it is likely that if a new specification is introduced both costs and benefits will be different depending on whether the costs are socialised or market forces are allowed to prevail.)
8	Do you consider that the data used to undertake this analysis is sufficient to support the conclusions presented in this report?	As there is plenty of data on gas quality available at least on TSO level on the de facto concentration of trace substances and other properties of gases flowed in Europe, E.ON views the data used for this report as insufficient for a thorough cost-benefit-analysis.
9	Should significant effort be made to improve the data used in the analysis presented in this report?	Yes, as specific data on gas quality is available. However, this effort should be done only in a cost and time efficient manner (e.g. they should be proportionate to the expected positive effects of the results of this further study).
10	Do you have access to further data that could (if it were made available) improve the quality of the data used in the analysis presented in this report?	E.ON is prepared to further explore the data necessary for a more elaborate report with added value. We believe we, like other parties, may have access to data that can be of benefit to the study. However, analysis should be made to ensure that this data is not already available to the consultants and that this data can be released and utilised with due respect for cost and time efficiency, as well as confidentiality.
11	Can you provide typical detailed gas composition at cross border points?	Please see our answer to question 10.
12	If so, can this data be made	Please see our answer to question 10. This depends on the data that is being requested or exchanged.



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	available (respecting confidentiality, as required)?	
13	How should data be collected for such a study?	<p>General data on gas quality in the EU market should be obtained from TSOs, as these monitor the gas quality at certain points in the system on a regular basis. This data can provide historic trends and can indicate 'hot spots' for fluctuations and/or deviations from average or accepted gas quality. This information should provide the basis of the analysis.</p> <p>Information about current and future gas qualities should be obtained from the large producers supplying pipeline (and LNG) gases to the European market. Historic data should be provided by the EU TSOs.</p> <p>LNG terminal operators should provide data for historic LNG deliveries.</p> <p>It should be examined which gas qualities can be expected from new gas sources for the European market, e.g. from gas sources in the Caspian Sea area or from Turkmenistan, or Iraq.</p> <p>It is not totally clear how costs have been applied and whether these are realistic (see response to Q1). Additional and more realistic cost data should be considered.</p>