Call for quotation for E20/25 engine testing

for preparation and shipment of base fuels

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Background

Under the EU H2020 research and innovation programme a project has been developed for which the European Commission (EC) and CEN have signed a contract (SA/CEN/RESEARCH/EFTA/000/2014-13) under the Framework Partnership Agreement with CEN-CENELEC (FPA). The project is titled: "Engine tests with new types of biofuels and development of biofuel standards". One of its objectives being to study the overall sensitivity of future (Euro 6c technology) vehicles and the fuel logistics' system towards mid-blend oxygenate ("E20/25") petrol and to prepare a more in-depth Auto-Oil-Ethanol programme on E10+.

The work that this tender covers has the scope to procure ethanol and gasoline product in sufficient quantity in order to subsequently blend fuels in line with a test fuel matrix provided. This is followed by supply a sub-set of sample bottles to pre-indicated labs to allow them to execute octane measurements. At a later point in time larger quantities of a sub-set of the samples are reproduced.

Objectives

The project is to study the overall sensitivity of future (Euro 6c technology) vehicles and the fuel logistics' system towards mid-blend oxygenate ("E20/25") petrol and to prepare a more in-depth Auto-Oil-Ethanol programme on E10+. This project is a scoping study. Gas exhaust emission studies form the basis for a broader industry-wide study in line with the past RUFIT (Rational Use of Fuels in Private Transport) study. The concept of a new petrol fuel quality specification for E10+ is thus established and will in the end be presented to CEN/TC 19 and the EC for further decisions regarding developing deliverables for it.

Tender basics

This tender is part of an overall project funded by the European Commission and executed by the European Standardization Committee, CEN. Project execution is being seconded to NEN, the Dutch Standardization Institute. NEN has appointed a *programme manager* and has installed a group of experts to advice NEN on the effective testing and research required. This *TF1* has established the technical content of this call for quotation and assigned a *project manager* as their technical spokesperson. When indicated as part of the tender, the tenderer may be required to visit meetings of the *TF1* on invitation by NEN. The *programme manager* acts as the contact for the tendering organization (*tenderer*); he/she will receive the reports and deliverables.

Overall the tender consists of the following:

I. sufficient volumes of ethanol, ethers and gasoline constituents (feedstock) are procured, stored and processed (blended) for further testing and work. The volumes and qualities shall be derived from the test fuel matrix as in Annex A;

II. preparation of 8 blends as indicated in Annex A in bottles of 10 litre, which shall be sent, together with 4 x 7 bottles received to four labs located in the USA and Europe;

III. production of a first set of all 32 master blends as indicated in the test fuel matrix, for which the properties indicated in the test matrix in Annex B are reported;

IV. subsequent preparation of a second sub-set of 10 blends selected from Annex A in larger quantities and distribution to a single location in Europe.

Tasks to be performed

The main tasks of the *tenderer* during the contracting period are:

- Discussion of the blending/test programme with the *project manager* assigned by the *TF1* and with the *programme manager*;
- Develop a blending plan based on the composition and octane requirement as in Annex A for the 32 master blends, assuring that each of tem can be made in larger quantities some eight weeks afterwards;
- Procurement of the necessary consumables (if not already in stock);
- Preparation of the 32 master blends in line with the requirements of Annex A in volumes of minimal 20 litres - the ethanol used shall be according to EN 15376 - and condition and store them to prevent degradation and contamination for the time of the contracting period;
- Preparation of the pre-selected 8 octane test blends (see Annex A) in volumes of minimal 50 litres and make 5 sets of 10 litres of product out of them in newly bought sample containers. Label, condition and store the sample containers to prevent degradation and contamination for the time of the contracting period;
- Reception of an additional set of 4 x 7 octane test sample containers (10 litres each) provided via the *programme manager;*
- Distribute the sample bottles to 3 labs spread around Europe and 1 in the USA (addresses will be provided by the *programme manager)*. So a set of 15 containers to be distributed to 4 labs.
- Ensure that 10 litres of each of the eight prepared octane test blends is safely stored for future reference or if samples are lost/damaged during distribution;
- Test each of the 32 master blends in order to determine the values for each of the properties as indicated in Annex B using the standard test methods mentioned. Report these values to the *project manager*;
- Distribute on request samples of 1, 5 or 10 litre of each of the 32 master blends to a location in Europe for a quality cross-check;
- On the basis of feedback from the *project manager*, preparation of a sub-set of 10 of the master blends, each in volume of minimum 2000 litres, and condition and store them to prevent degradation and contamination for the time of the contracting period.
- Test each of the master blends in the sub-set in order to define the expected value for each of the properties as indicated in Annex B using the standard test methods mentioned (or less in coordination with the *project manager*). Report these values to the *project manager.* Take into account this testing when preparing the volumes;
- Send these 10 x 2000 litres of fuels in drums to a location in Europe as indicated by the programme manager.

Execution of the work

Blending and preparation of sample containers and drums is to be executed at the premises of the *tenderer*. The *tenderer* will use commercially available constituents to make the master blends.

The *tenderer* will present a plan to the programme manager. The *tenderer* may present suggestions for alternative blends or test methods than indicated in the Annexes, but only apply those once there is agreement by the *TF1* and the *programme manager*.

The *tenderer* shall cooperate in evaluating the test method results reported.

A *tenderer* representative shall take part in the taskforce meeting where the final test report is being discussed (foreseen during the contracting period and to take place in Europe) in order to exchange information and cooperate in the advice to CEN regarding the E20/25 blend specification. Additional web-exchanges can be required as well.

The *tenderer* shall report to the *programme manager* about the test progress and results. The *programme manager* may visit the *tenderer* facilities to check progress and discuss the RR work. The *programme manager* may require an interim written status report. The *tenderer* shall present a detailed written report on the test execution and results. The test results and reports shall become property of the contractor.

The *tenderer* shall at the end of the project and on request of the *programme manager* destroy the remaining samples and master blends in his possession.

General confidentiality around the fuels involved, laboratories participating and results, etc. shall apply and the tenderer shall not distribute any results other than to those involved in the tender.

The *tenderer* will present an overall work plan and planning with the tender proposal.

Award criteria for the tendering process

Offers for provision of the testing and reporting are treated individually although consortium offers will also be considered. Offers can also be from a single person, which should however have a VAT number and a company registration.

Selection of subcontractors will be based on the following criteria:
1) **Documented experience** (maximum 40 points):
- number of years working in relevant field
- demonstration of experience in leading and / or managing of similar projects
- demonstration of experience in oxygenated gasoline fuels' blending and optimization, handling and shipment
- demonstration of experience with the indicated test methods in Annex B
- technical experience and consulting activities in relevant field
- experience in European and/or international standardisation work
- experience in running European or/and international programs

2) **Organization** - demonstration of ability and understanding of the project (maximum 40 points):
- infrastructure and ideas regarding chemicals, oxygenates, BOB, blend preparation and sample containers
- proof of accessibility to a wide range of refinery gasoline blend components and streams
- facilities used for the blending
- organization of the sample preparation, measurements, testing and reporting
- use of tax warehouse(s), registered consignee numbers or (local) import agents and assurance of appropriate documentation for export and import of samples to prevent tax difficulties and shipment delays
- established quality system

Possibility to complete the octane test sample preparation and shipment of the sub-set before 20 April 2017 will be considered an advantage.

Only offers that pass the selection criteria of scoring minimum 30 points under 1) and 25 points under 2) will be further evaluated.

3) **Quotation price** (maximum 20 points).
The quotation shall give insight in the costs for:
- fuel handling and sample preparation,
- shipment for the first sub-set of samples to the USA and Europe and for the second shipment of the large quantity,
- making all the pre-blends in total and the second set per blend, and
- overall organization and exchanges with the taskforce and the programme manager.

The offer with the highest points will be selected.

Replies to tender

Tenders can be sent (by mail or e-mail) to the programme manager as soon as possible, at the latest at 30 January 2017.

The tender shall contain a specified breakdown of tasks, costs and expenses for work, travel, consumables and others where relevant and a first planning for the execution of the tasks, which will form the start of the discussion regarding the tender contract.

If necessary, additional information can be obtained via the programme manager, Mr O. Costenoble (T: +31 15 2690 330, e: energy@nen.nl). Interested parties are strongly advised to present their intentions to bid and their eventual questions on the content of the tender or the process by 15 January 2017.

Annex A - Test fuel matrix

This Annex presents the types of master blends for the tender.

Choice of fuels and blends

Thirty-two E20/25 fuel blends have been selected (identified by numbers in the table below). They are both summer- and winter-grade type gasolines and are based on ethanol and/or other oxygenates, plus a gasoline basis made out of chemicals whilst targeting for the highest possible total aromatics and olefins content as allowed in EN 228. The final blend shall be made in order for the volatility and research octane number targets to be fulfilled. This means that the gasoline composition might change for all of the 32 blends

The green column numbers are the 8 octane test blends from which 10 litres need to be distributed to 4 labs in the USA and Europe.

Parameter	units	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33
Ethanol content[1]	% (*V/V*)	10	7,5	20	20	20	20	15	15	15	15	25	25	15	15	0	0	15
ETBE content	% (*V/V*)	0	5,5	0	0	0	0	11	11	11	11	0	0	23	23	0	0	0
Octane	RON	95	95	95	98	100	102	95	98	100	102	100	102	100	102	100	102	100
Volatility	kPa	between 55 and 60																
Total aromatics	% (*V/V*)	target is 35, shall not be lower than 25																
Olefins	% (*V/V*)	target is 10, maximum allowed at 18																
Octane	MON	≥ 85																
		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34
Ethanol content	% (*V/V*)	10	7,5	20	20	20	20	15	15	15	15	25	25	15	15	0	0	15
ETBE content	% (*V/V*)	0	5,5	0	0	0	0	11	11	11	11	0	0	23	23	0	0	0
Octane	RON	95	95	95	98	100	102	95	98	100	102	100	102	100	102	100	102	100
Volatility	kPa	target is 80																
Total aromatics	% (*V/V*)	target is 35, shall not be lower than 25																
Olefins	% (*V/V*)	target is 10, maximum allowed at 18																
	MON	≥ 85																

[1] complying to EN 15376

Annex B - Test methods

This Annex presents the test methods to be used to assess the master blends made.

Property	**Units**	**Test Method**
Research octane number, RON		EN ISO 5164:2014
Motor octane number, MON		EN ISO 5163:2014
Density (at 15 °C) [c]	kg/m^3	EN ISO 3675:1998, or EN ISO 12185:1996
Hydrocarbon type content: - olefins - total aromatics - total hydrocarbon content - aromatics distribution	% *(V/V)*	EN ISO 22854:2014
Benzene content	% *(V/V)*	EN 238:1996, or EN ISO 22854:2014
Oxygen content	% *(m/m)*	EN 1601:2014, or EN ISO 22854:2014
Oxygenates content - ethanol - ethers (5 or more C atoms) - other oxygenates	% *(V/V)*	EN 1601:2014, or EN ISO 22854:2014
Vapour pressure	kPa	prEN 13016-1:2016
% evaporated at 70°C, E70	% (*V/V*)	EN ISO 3405:2011
% evaporated at 100°C, E100	% (*V/V*)	EN ISO 3405:2011
Final Boiling Point (FBP)	°C	EN ISO 3405:2011
Energy density		to be suggested by tenderer