

Invitation to tender

IPTS-

Technical Specifications

Study on the suitability of the different waste-derived fuels for end-of-waste status in accordance with Article 6 of the Waste Framework Directive (2008/98/EC)

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BACKGROUND

Article 6 of the new Waste Framework Directive (WFD)¹ establishes the legal framework under which a waste that has undergone a recovery can cease to be waste (end-of-waste status). In particular, it creates the possibility to establish EU-wide end-of-waste criteria for certain specified waste types. In the current absence of EU-wide end-of-waste criteria, Member States may decide case by case whether certain waste has ceased to be waste taking into account the applicable case law.

The WFD requires that the end-of-waste criteria for a specific waste must be developed in accordance with the following four conditions:

- (a) the substance or object is commonly used for specific purposes;
- (b) a market or demand exists for such a substance or object;
- (c) the substance or object fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products;
- (d) the use of the substance or object will not lead to overall adverse environmental or human health impacts.

In a preparatory study² on identification and prioritization of streams for end-of-waste, waste-derived fuels have been found as potential candidates. Some wastes of organic origin can be used directly in a combustion process to generate energy, or they can be processed into a material that can serve as a fuel. When a specific fuel is obtained from waste, the question arises if this fuel is suitable for end-of-waste status.

The Commission needs to decide whether to propose EU-level end-of-waste criteria for the different types of fuel that can be obtained from waste and that are suitable for end-of-waste status, or to leave the question to case by case decisions by the Member States.

The Commission needs to be in a position to assess if the four conditions of Article 6(1) of the WFD are met when receiving notifications from the Member States about case by case decisions on the end-of-waste status of fuels derived from waste.

¹ 2008/98/EC of 19 November 2008

² "Study on the selection of waste streams for End of Waste assessment", JRC-IPTS (2010).
<http://susproc.jrc.ec.europa.eu/activities/waste/>

1 OBJECTIVES

The purpose of the study of this tender is to provide detailed information and analyses on all the relevant aspects that the Commission needs to consider when proposing the end-of-waste status of fuels derived from waste.

The study shall analyse the suitability of the different types of waste-derived fuels for obtaining the end-of-waste status in accordance with Article 6 of the Waste Framework Directive. To this aim, the study shall identify the different types of fuels derived from waste that are currently generated in the EU, as well as the uses currently made of these fuels. The fuels shall be briefly characterized, including a quantitative estimation of the generated and used amounts.

For each specific type of waste-derived fuel, and for each identified use of the fuel, the study shall then assess if it would be possible to meet the four conditions given by Article 6(1), namely:

- if it is commonly used for a specific purpose (i.e. to obtain energy, and if relevant other complementary purpose such as use of the ashes in cement clinkers or tiles)
- if a market or demand exists for the fuel
- if there are technical requirements, legislation and standards for the use of the fuel
- if the use of the fuel will not lead to overall adverse environmental or health impacts.

Furthermore, the assessment shall include other considerations that influence the suitability of the different types of waste-derived fuels for end-of-waste status, in particular how setting EU-level end-of-waste criteria could support, work against or in any way affect existing EU policies, including principles such as the waste hierarchy, the achievement of recycling targets and renewable energy use targets, or the protection of health and environment from the impacts of waste incineration.

The study shall also assess for each type of waste-derived fuel if it is currently considered waste by the relevant industrial operators, by the competent authorities and by case law.

The results of the study may in a later phase be used by the JRC-IPTS to develop technical proposals of end-of-waste criteria for waste-derived fuels.

2 APPROACH

The study shall make full use of the relevant published information, such as standards, legal texts, existing studies, or similar, and combine it with newly elicited information, e.g. by means of surveys and interviews with the relevant experts, according to the requirements of the different tasks.

The results of the study shall be delivered in the form of a written report, including tables and figures. The report shall document precisely the methods and data sources

used, and assess the quality and reliability of the information used, and the degree of uncertainty of the results obtained.

This study shall be structured in two separate working periods, split by a stakeholder consultation. The Commission intends to consult stakeholders on a draft report, to be delivered by an interim deadline. The Contractor will revise the draft report considering the inputs from the stakeholder consultation.

3 SCOPE

In this study, the term 'waste-derived fuels' shall be understood in a wide and comprehensive sense, so as to include any type of fuel, be it solid, liquid or gas, that is obtained from waste. The definition and scope of waste is as provided in Article 2 of the Waste Framework Directive 2008/98/EC. Waste which is excluded from the scope of the Directive is not considered for the purpose of this study.

Below is a non-exhaustive (and partly overlapping) list of waste-derived fuels. It shall be noted that some of the fuels mentioned are always waste-derived (e.g. waste wood, waste oil), while others are not necessarily waste-derived (e.g. biodiesel, bioethanol, animal by-products). The scope of this study is only the fuels that are waste-derived.

Gaseous:

- Biogas, gasification and gaseous pyrolysis outputs

Liquid

- Biodiesel
- Bioethanol
- Waste oil (mineral and synthetic)
- Waste oil (vegetable oils, cooking oils)
- Waste solvents
- Industrial liquid waste concentrates (e.g. spent liquors, membrane, evaporation and centrifuge concentrates)
- Liquid pyrolysis outputs (e.g. heavy oils)

Solid:

- Waste wood
- Waste tyres, waste rubber
- Waste plastics
- Waste paper
- Waste textiles
- Bio-waste (as defined in the WFD)
- Different types of solid fuels prepared from non-hazardous waste, including municipal solid waste ('refuse derived fuels- RDF'), for energy recovery
- Animal by-products and derived products (e.g. tallow)³
- Dried sewage sludge and industrial dewatering cakes
- Pyrolysis solid outputs (e.g. char)

All relevant stationary and transport combustion or incineration processes are to be considered, including:

³ except those excluded from the scope of the WFD 2008/98/EC

- Heating, cooling and power generation, and combinations of these
- Combustion engines and gas turbines
- Combustion in process plants
- Incineration with energy recovery
- Use as a regular or additional fuel in co-incineration plants as defined by the Waste Incineration Directive⁴
- Household ovens and boilers

The study shall cover the European Union, its 27 Member States, and when relevant for the goal of the project, the administrative units within the Member States.

4 TASKS

The Contractor is to perform the following tasks during the duration of the contract:

Task 1: Technical characterisation of the different waste-derived fuels and their uses

All the different types of waste-derived fuels that are generated or used in significant amounts (i.e. in higher amounts than for purely experimental purposes) in the EU today shall be identified ("long-list"), and be characterised in technical terms. The technical characterisation of a fuel type needs to include at least the following aspects:

- energy content (MJ/kg)
- physical state (solid, liquid, gas) in ordinary use conditions
- description of the different processes in which it is normally used, and in which it potentially may be used
- type of energy generation for which the fuel it is fit (power, automotive, different scales of heat generation, etc.)
- description of other uses (e.g. ashes in cement clinker) simultaneous to energy use
- description of alternative, non-energy uses of the material, e.g. use of tyres for roadmaking and playgrounds
- identification of the waste sources the fuel can be obtained from, specifying the processes or treatments involved
- characterisation of the air emissions generated by using the fuel, and any other relevant environmental or health impact issue
- characteristics of the solid combustion residues generated, and their uses
- which fuels (conventional, not waste-derived) are being substituted by the use of the waste-derived fuel, or would substitute the waste-derived fuel.
- any other relevant technical aspects that need to be understood for achieving the objective of the study

Task 2: Quantification of the amounts of the different types of waste-derived fuels that are used in the EU today

For each of the different types of waste-derived fuels identified, the study shall quantify the amounts generated, traded and used in the EU (tonnes and energy units per year). As far as possible, quantifications shall be made per Member State and provide separate numbers for the amounts of a fuel obtained from different waste sources. The fuel types and waste sources that dominate in quantity shall be identified.

⁴ 2000/76/EC

The amounts of waste-derived fuels shall be compared to the amounts of substitute conventional fuels (see Task 5).

The amount of each waste-derived fuel type traded among EU member States, and in/out of the EU shall when possible be quantified separately per country of origin and per destination country. The main international trade partners of waste-derived fuels (intra and extra-EU if relevant) shall be identified.

The amounts of waste-derived fuels considered waste and non-waste shall be quantified separately.

In addition to the data for the reference year an assessment shall be provided of developments over time of amounts generated, traded and used.

Task 3: Analysis of the market and demand for the different types of waste-derived fuels

The study shall analyse and report the following information, for each type of waste-derived fuel and where reasonable distinguishing between the situation across Member States:

1. The market structure: the different players in the generation and management of the waste, and in the reprocessing, trade and use of the waste-derived fuel, and the relationships between the players. The strength and stability of the demand, in relation to the supply.
2. The cost of producing the fuel and of using it, compared to substitute fuels.
3. The market prices (e.g. EUR/tonne, EUR/GJ), being precise about the point in the chain where this price is quoted (e.g. factory gate, delivered to door). How are the prices settled? The development of prices over time (price volatility) is an important element of this information, and should be assessed including the main factors that explain these developments. The information shall include a comparison to the market price of the conventional substitute fuels, and the degree of correlation between them.
4. The current and future market size (kg/year and EUR/year), considering both the demand side and the supply side. How can prices be expected to develop in the future?
5. The role of public market support for the waste-derived fuel.

All monetary information shall be presented in euro (EUR) and indicate clearly the time when it was reported (year, if appropriate also month).

Task 4: Identification and assessment of the technical requirements, specifications, and standards that apply to the different types of waste-derived fuels

The study shall assess to what extent specifications, standards, protocols, declarations of origin, certification schemes or similar exist and are being used for the different types of waste-derived fuels. The study shall distinguish whether the requirements are part of legislation or part of commercial agreements. It shall also identify relevant references and summarise the contents, including inter alia the CEN work on solid recovered fuels (CEN/TC 343), relevant international and national standards and specifications and the Waste Incineration Directive⁵.

The study shall also document the technical requirements of the fuels which the waste-derived fuels substitute, and compare both.

⁵ Directive 2000/76/EC on the incineration of waste

The study shall assess the degree of application in practice of the standards or specifications, and compare their technical contents. In what respect are they different, which aspects do the standards address or regulate (e.g. technical, environmental, human health-, safety-related)? Which aspects are not addressed? The results may be presented in a double entry table in which e.g. rows display the different areas of application of requirements (input material, processing of the material, quality of the output, distinguishing legislative and commercial), columns display the rationale for the requirement (environment protection, health and safety protection, technology constraint, economy), and cells include each of the controlled elements (e.g. energy content in MJ/kg, Chlorine content in ppm).

The study shall describe in detail current practices of qualitative and quantitative quality control of the waste-derived fuels for meeting the specifications. This analysis shall include staffing, time requirements, type of equipment used, parameters analysed, and methods followed. The study shall specify where in the supply chain these quality control practices are undertaken.

Task 5: Analysis of the extent to which the different types of waste-derived fuels are considered waste under the current legal situation

For each of the different types of waste-derived fuels, the study shall analyse if today they are legally considered waste or non-waste in the EU. The analysis shall scrutinise the relevant court cases (the case law), and the administrative practices by the competent authorities in the Member States. One of the elements to look at is the VAT regime applicable to waste-derived fuels in each Member State, which is an implicit recognition of the added value of the material. The study shall point out any differences between Member States and if relevant also across the different administrative units within them, reporting any contentious cases. This analysis needs not address all of the Member States separately but may use a sample that represents the different parts of the EU.

In cases where a waste-derived fuel is considered non-waste it shall be clarified under which conditions this is the case, i.e. on what basis do the industrial operators or authorities decide that the material is not waste (national end-of-waste criteria, technical requirements fulfilled, proof or information provided, exemptions applied, etc.).

Task 6: Initial assessment of suitability for end-of-waste status based on the outcomes of Tasks 1 to 5

The waste-derived fuels contained in the "long list" prepared as part of Task 1 shall be screened by means of testing against the outcome of Tasks 1 to 5. From this screening, a "short list" shall be established of waste-derived fuels that are potentially suitable for end-of-waste status.

The screening shall assess for each fuel if the first three conditions in Article 6(1) of the Waste Framework Directive can be met. The screening shall also apply the findings of Task 5, i.e. consider for each of the fuels if they are considered waste today and if end-of-waste criteria could contribute to clarify or harmonise the legal situation throughout the EU. Condition (d) of Article 6(1) (no overall adverse environmental or human health impacts) shall not be applied in this screening, as it is to be addressed separately in Task 7.

Task 7: Assessment of the potential overall environmental and health impacts of using the different types of waste-derived fuels

For each of the fuels included in the short list of Task 6, the Contractor shall complete the assessment of suitability of end-of-waste criteria by also assessing whether the end-of-waste status would not lead to overall adverse environmental or health impacts.

As part of this assessment, the Consultant shall analyse, for each of the fuels, if waste law and in particular the provisions of the Waste Incineration Directive are needed to protect the environment and human health, and how effectively other legislation (such as the Large Combustion Plants Directive⁶ as well as the IPPC Directive⁷) could deliver equivalent protection if a fuel attains end-of-waste status. Such an assessment shall include, if applicable, a comparison of the emission limit values associated with best available techniques, as well as the legal minimum requirements for combustion plants, incineration plants and co-incineration plants.

The assessment shall complete the assessment by undertaking the following tasks:

- compare the air emissions of the use of the different types of waste-derived fuels characterised in Task 1 to the emission of the conventional fuels they substitute, including if any specific abatement measures are needed when using the waste-derived fuels to achieve the same emission levels as associated to the comparable use of conventional fuels.
- compare the solid residue generation of using the different types of waste-derived fuels, as characterised in Task 1, with those of the conventional fuels they substitute, and describe the current possible uses of such residues. Compare the potential environmental and health impacts of the use of the solid residues, describing any specific abatement or treatment measures needed for the handling of residues.
- review for each of the different waste-derived fuels any relevant existing assessments that compare their life-cycle environmental and health impacts to those of the conventional fuel alternatives.
- for each of the different waste-derived fuels, review any relevant existing assessments of the life-cycle environmental and health impacts of the energy recovery option compared to the alternative waste management options (as identified under Task 1). Special attention shall be given to how the emission levels and the assumptions on substituted fuels from the energy recovery processes influence the overall assessment.

Finally, the assessment shall address wider environmental considerations in EU waste policy. More specifically, the study shall assess how end-of-waste status for the analysed types of waste-derived fuel could contribute or work against the following EU waste policy objectives and principles: the waste hierarchy, existing recycling targets, and whether the end-of-waste could be in conflict with the intentions of Article 21(3) of the WFD regarding shipments of waste oils. Furthermore, the assessment shall assess the linkage to the EU objectives on renewable energies.

⁶ Directive 2001/80/EC on the limitation of emissions of certain pollutants into the air from large combustion plants

⁷ Directive 2008/1/EC concerning integrated pollution prevention and control