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Deliverable D5:

## **Listing of gaps in legal frame between European level and national levels**

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## 1 Scope of the Report

The Gasification Guide project deals with small and medium scale biomass gasification, which is an emerging technology for the efficient conversion of renewable energy sources into electricity and heat. Leading gasification experts from around the world have identified Health, Safety and Environment (HSE) issues as an important barrier to technology deployment and market uptake. From an engineering point of view, the legal HSE framework in Europe applicable to the design, manufacturing, putting into service and operation of biomass gasification plants has been perceived as non-uniform and even inconsistent in certain areas.

In this report, a number of so-called "legal gaps" with regard to HSE requirements for biomass gasification have been compiled from an analysis of gasification experts' experience with the current legal framework for biomass gasification in Europe. The term "gap" has been chosen to reflect the impression that manufacturers and operators have gained with a view to HSE requirements for biomass gasification. It is recognised that jurists may have a different opinion on this subject, being able to fill any and all of these perceived "gaps" with suitable interpretations of European and national law.

Manufacturers and operators of small and medium biomass gasification plants as well as local regulatory authorities, however, are often in a situation where limited resources make it difficult to find satisfactory solutions to the problems arising from a legal framework that seems to be partly incomplete or inconsistent with regard to biomass gasification. This report aims to name those areas which have given particular rise to discussion in the past.

## 2 Areas of uncertainty with the legal framework

### 2.1 Application of "best available techniques" (BAT)

With regard to the application of BAT requirements to small and medium biomass gasification plants, the key questions seem to be,

- Are small and medium BGPs in the scope of BAT requirements at all?
- If BAT requirements apply, which techniques can be regarded as "best available" for biomass gasification?
- Which emission limit values are associated with BAT in this case?

The analysis of the legal framework for the construction, putting into service, and operation of biomass gasification plants performed in the Gasification Guide project (Deliverable No. 4) has revealed that small and medium BGPs, while not in the scope of the IPPC directive, may still be covered by national regulations transposing the IPPC directive. As a result, the application of BAT will generally be required in those Member States where small and medium BGPs are subject to permit requirements derived from the IPPC directive. If a specific BGP activity is not in the scope of such regulations, there will generally be no requirements for that activity to meet BAT standards.

Due to the different transpositions of the IPPC directive into national law of the Member States, a certain type of BGP may need to fulfil BAT requirements in some Member States but not in others.

The second question concerns the techniques suitable to minimize the environmental impact from BGP operation.

According to Article 2 No. 11 of the IPPC directive<sup>1</sup>,

‘best available techniques’ shall mean the most effective and advanced stage in the development of activities and their methods of operation which indicate the practical suitability of particular techniques for providing in principle the basis for emission limit values designed to prevent and, where that is not practicable, generally to reduce emissions and the impact on the environment as a whole:

- ‘techniques’ shall include both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned,
- ‘available’ techniques shall mean those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages [...],
- ‘best’ shall mean most effective in achieving a high general level of protection of the environment as a whole.

This definition implies that BAT does not prescribe the use of a particular technique, but requires that techniques which are sufficiently developed and economically viable for the activity in question be considered as a reference case. The plant owner or operator may resort to different techniques, but the performance of the selected techniques will have to be evaluated against that reference case.

As biomass gasification can be regarded as a technology that is at the threshold between demonstration and commercial application, there is still some uncertainty about the practical (and long-term) suitability of emission reduction techniques currently in use. Therefore it is not clear if any of the emission reduction techniques employed in BGPs so far have yielded sufficient operating experience to claim that they represent BAT.

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<sup>1</sup> Directive 96/61/EC concerning integrated pollution prevention and control – IPPC directive

The third question, closely related to the second one, concerns the emission limit values (ELVs) associated with BAT. Which limits for emissions like CO in the flue gas can be achieved "under economically and technically viable conditions, taking into consideration the costs and advantages"?

For reasons described above, there are hardly any emission limit values specific for biomass gasification plants. A simple approach encountered on some occasions consists in applying emission limit values derived for "similar" types of plants to BGPs (like plants using biogas, sewer gas or even natural gas in internal combustion engines).

Obviously, this approach will lead to emission limit values that have an apparent legal justification. The drawback of this approach is its inaptitude to allow for the specific technological features of biomass gasification plants:

Using a fuel gas rich in carbon monoxide in an internal combustion engine will inevitably result in a certain "slip" of uncombusted fuel to the raw flue gas in the order of 1 %. Standard emission limit values for CO in incineration applications, however, refer to CO as an indicator of the quality of combustion, where low CO concentration is used as an easy-to-measure property that represents concentrations of hazardous but difficult-to-measure combustion products (like polycyclic aromatic hydrocarbons, PAH). While the relationship between PAH and CO concentrations in the flue gas has been well established for ordinary combustion processes, the relationship is quite different for biomass gasification plants. Due to this fact, the use of "standard" CO emission limit values for BGPs with internal combustion engines may not be adequate, as CO is neither suitable to predict the flue-gas concentration of other hazardous combustion products (like PAHs) in this case, nor do standard CO ELVs reflect the hazards associated with the carbon monoxide itself.

From these considerations, a desirable solution for BGPs would include

- the determination of the current state of techniques for the limitation of emissions from small and medium scale biomass gasification plants,
- the determination of high-concern substances in BGP flue gas that deserve special attention with regard to emission limits, and
- the derivation of suitable emission parameters (target values or limit values) that have been found to reflect high-concern emissions adequately.

## **2.2 Conformity assessment and declaration**

In deliverable D4 to the Gasification Guide project (Benchmarking of the Legal Frame), the topic of formal requirements (declaration of conformity, CE marking) as defined in European Directives according to Article 95 of the EU Treaty has been presented in detail.

In discussion with BGP manufacturers, operators, and with representatives from regulatory authorities it has become obvious that there is considerable uncertainty about the interpretation of these directives with a view to biomass gasification plants. A common notion appears to be that "all industrial products need a declaration of conformity and CE marking". With regard to installations seen as an entity, this is certainly not true, as has been elucidated in deliverable D4.

Declarations of Conformity issued by a BPG manufacturer for an entire biomass gasification plant could cause problems from the legal point of view, as Art. 95

Directives have a scope of application, defined in the directives and illustrated in pertinent official guidelines or comments. Equipment and installations not in the scope are not entitled to DoC (as there is no conformity that could be declared).

A second, probably even bigger problem would result from the fact that modifications of a biomass gasification plant after putting it into service can be regarded as a rule rather than as an exemption at the current state of development. After any change to the plant layout or to single pieces of equipment, the operator or the manufacturer would be in a situation that requires a formal renewal of the Declaration of Conformity (in addition to the modified risk assessment). This does not seem to be a viable option, and it will be necessary to find out working solutions in the scope of the case studies foreseen in WP 4 of the Gasification Guide project.

### **2.3 *European internal market: manufacturing vs. operation***

Free market access for products in Europe is guaranteed for products that comply with essential requirements for safety and health as set out in Article 95 directives, which are valid in all European Member States. Operation of products, however, will be subject to varying national legislation that may take additional health and safety aspects into account (e.g. in terms of required testing prior to putting into service), but may also concern other areas (e.g. environmental protection: emissions to atmosphere, waste water, noise) for which no harmonized European requirements or standards are binding.

As a result, the manufacturer of a biomass gasification plant may end up with a unit that can legally be sold in all European Member States, but that will need adaptation of emission reduction techniques to each individual location before putting the plant into service. Therefore, a very detailed investigation into the legal requirements for a particular site seems to be indispensable, and this investigation will require mutual efforts of the manufacturer and of the prospective plant operator.

Combining the most demanding requirements for each individual aspect and for any potential location into the design of a BGP, however, would end up with the manufacturer offering a product that could not be competitive on the market, which would make the latter solution prohibitive.

This situation is extremely dissatisfactory for the broad market uptake of biomass gasification technology, which would be desirable from the Renewable Energies point of view.