

**Response to Comments from the Public Consultation
on the M/LFM-DE_ER: Methodology for Projects for
the Destruction and Utilisation of Biogas from
Landfill Sites**



Version 2.0

Medellin, 24 April 2023

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Methodology for Projects for the Destruction and Utilisation of Biogas from
Landfill Sites**

Dear participants,

Cercarbono is very pleased to have the independent participation of those interested in the methodological development offered by our standard. Once again, we would like to highlight our thanks for your participation and the great interest received in the public consultation of the “M/LFM-DE_ER: Methodology for Projects for the Destruction and Utilisation of Biogas from Landfill Sites”, carried out electronically from 17.01.2023 to 16.02.2023.

The attached table details the comments received (submitted anonymously) and the response to them issued by our expert staff, which will also be available on our website in the Consultations section. These valuable comments will allow us to generate a more complete and robust methodology document so that developers and formulators of projects in the Waste Management sector according to the scope of application of the methodology can participate under our certification programme.

We will soon be publishing the new version of the methodology, which will be deposited on our website, methodologies section.

We thank you once again for your time spent in reviewing it and for your valuable contribution.

Sincerely yours,



Carlos Trujillo Echeverri
CEO Cercarbono

No.	Text/comment	Methodology section	Response
1	The document allows the methodology to be followed in an orderly sequence of concepts.	ND	Not applicable comment.
2	CarbonDivest.Org., Inc has successfully accomplished the management of directing our BioGas/Landfill project in Cerro Patacon, Panama through the carbon credit certification process on the EcoRegistry of Cercarbono. I am happy to engage in an open discussion about this experience.	ND	Not applicable comment.
3	What is the difference between landfill biogas and biodigester biogas with respect to the methodology? Can't there be a generic methodology for biogas no matter what the source?	ND	The methodologies that Cercarbono develops on its own initiative are aimed at facilitating the development of climate change mitigation projects in activities with high environmental and social impact. In this sense, this methodology is aimed at promoting the capture and use of biogas in operational landfills, generally serving communities, which operate with all types of municipal solid waste and represent important sources of GHG generation and with relevant social impact on their geographical and human environment. The process covered is the degradation of such waste when it is deposited in the landfill. Cercarbono's criteria regarding the inclusion of different processes of biogas generation from solid waste in one or several methodologies is aligned with other GHG emission reduction certification standards, in which there are specific methodologies for the mentioned process (biodigestion), because: - The same may or may not be part of a landfill facility. - In general, a waste selection and treatment process is required prior to sending the waste to the biodigester, which is not practical to implement in operating landfills for waste deposited prior to the facility of such a system. - The inclusion of multiple biogas generation processes from multiple sources would blur the focus of the methodology in terms of the sector of application. - The application of biodigesters in landfills is not a common practice.

No.	Text/comment	Methodology section	Response
			- Existing methodologies could cover this situation, for which reference can be made to Sections 3.1, 5.1 and 6.3 of the Cercarbono's Protocol for Voluntary Carbon Certification, Version 4.2 or its successor in future versions.
4	Biogas as such cannot be injected into the natural gas grid, to be able to do so it must be separated and produce Biomethane, which is the equivalent of natural gas. This must be very clear as there are regulations in the countries for the injection of biomethane into the grid. There are several countries that have laws on bioenergy production.	ND	Indeed, this has been considered in various ways: - Two different cases have been considered for the baseline scenario, depending on whether the biogas is used for injection into natural gas grids (section 5.3.6) or dedicated biogas grids (section 5.3.7). This is because biogas-only grids do exist and it is a growing trend in local energy supply for small communities, as can be seen in Germany, Finland, India, Italy, the United Kingdom, and other countries. - On the legal side, any climate change mitigation project (CCMP) to be registered must comply with the applicable regulations and demonstrate it. - Regarding the technical aspect, the observation is implicitly considered, as there are restrictions imposed by the natural gas market, which include specifications for injection into natural gas lines, such as calorific value, CO₂, N₂ and H₂S content and minimum CH₄ content / Wobbe index or affectation to it, which must be met before the company or the competent authority can issue the authorisation for such supply, so it is not feasible to think that any producer can supply any network of this type. - In the project emissions, fuel, and energy consumption for the utilisation of the methane present in the biogas is considered, which includes the conditioning and treatment that the biogas would require for its use as biomethane. In response to your kind suggestion, the Cercarbono technical committee will analyse the advisability of adding text to indicate the above, which, if deemed appropriate, will be included in the corresponding sections of the methodology.
5	Biogas as such cannot be transported in tanker trucks or virtual pipelines, but biomethane can be transported.	ND	Biogas does not have to be raw to be considered as such, since biomethane requires a minimum CH₄ content of 90% to reach this category, although 95% is generally required. It is true that the transport of raw biogas is not commercially viable, but it is not accurate to state that it cannot be transported, which is not the purpose of this point, but to leave the possibility for local distribution systems of pre-treated biogas without reaching the biomethane category, which

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			is a reality in some countries such as India and China. The inclusion of this possible line of project activity is precisely to favour the implementation of projects that require financial support to be viable and that can improve the social situation of communities with scarce resources, since by eliminating it to consider only biomethane or renewable natural gas, these types of projects would not have the possibility of accessing carbon credits. There are studies currently underway in at least Germany, Finland, India, and Norway, in addition to those funded by the US Environmental Protection Agency (EPA) and the European Biogas Association in partnership with Universities and Research Laboratories, aimed at investigating the optimal pre-treatment point for the transport of compressed biogas that cannot be considered biomethane. The infrastructure for biogas transport with pre-treatment has already been developed and is available (composite cylinders and supercritical compression), although its application on a large scale will depend on the economic performance of such projects.
6	The generation of electricity and thermal energy with biogas must be done on site since biogas as such cannot be transported.	ND	Biogas is currently transported with different short pipeline systems in various parts of the world, including India and the UK, for use as domestic fuel or in small industries. The treatment of the design and operation of such transport infrastructure is extensive and abundant in sources. However, it is a reality that for commercial scale power and/or thermal generation, such transport could become uneconomic, making a project unviable. As mentioned above, the category of "biogas" encompasses not only raw biogas, so that different qualities and calorific values of biogas can be referred to in this way. It is true that to utilise biogas in significant quantities without it being fully upgraded to biomethane or renewable natural gas, the transport system must be as short as possible, although not necessarily on site. The necessary biogas transport infrastructure between the two facilities must be considered for methodological rigour in the estimation of project emissions, which is why it is included in the potential cases for this.

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7	In the production of biofuels (biomethane) there are technologies that also capture CO ₂ and it is stored and marketed as an input used by various industries replacing the mechanical CO ₂ that is traded on the market, how is this accounted for?	ND	Indeed, such technologies do exist, but since this is not a common case and the methodology addresses the utilisation of biogas, either raw or treated to any degree, and not the residues from such processes, it does not include accounting for the benefits of CO₂ capture and utilisation. However, the possibility of implementing a climate change mitigation project (CCMP) for such operations remains open, if it complies with the Cercarbono's Protocol for Voluntary Carbon Certification, Version 4.2 or its future versions. Although outside the scope of these consultations, the baseline scenario would be emissions from current CO₂ production. In general, the project scenario will include emissions due to energy consumption in the capture, treatment, storage, compression, and differential transport of CO₂ to the point of use with respect to the original source, among others.
8	 "The amount of methane produced in the landfill should not be deliberately increased through operational strategies, with respect to the identified baseline conditions...". Here it would have to be identified in some way that no leachate is being injected into the process and that its production can be increased if leachate is injected. This because normally landfills that do not have any biogas treatment process do not inject leachate, but if utilisation projects are planned, leachate must be injected, as this helps the production of biogas and therefore the generation of energy and/or biomethane and BIO-CO ₂ .	3 Purpose and field of application	The baseline emission estimation is based on the use of a first-order degradation model that considers only the composition of the waste mixture disposed on site, and therefore limits the emissions from the biogas produced in the landfill to this effect. It is true, based on the comment, that biogas production can be increased by injecting concentrated leachate or a combination of non-concentrated leachate and concentrated leachate, which modifies the first order degradation constant and then the baseline emissions corresponding to the last four (4) terms of equation 1 in section 5.2 of the methodology would increase. However, this is a temporary effect, as leachate injection is a strategy for accelerated landfill stabilisation and therefore this additional production will occur over a shorter period than without the application of this technique. Unless the amount of organic waste that would be recycled is increased, which is explicitly not allowed for in the methodology, the total amount of methane produced by a certain cell or amount of municipal solid waste will only increase marginally. Likewise, the re-injection of leachate will normally require authorisation for its management given its nature, which is not always permitted by the environmental or local authority. However, based on your comment, consideration will be given to the relevance of modifying the second item of the list of applicability conditions to

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			which you refer, so that it indicates that the quantity of methane referred to therein is the total quantity generated over time by a mass of municipal solid waste until its stabilisation. Furthermore, the possibility of limiting the total baseline methane emissions during the accreditation period to those originally estimated by the first-order degradation model shall be analysed to avoid the effect of the marginal increase in production due to accelerated degradation.
9	Can any verification company be used depending on the country where the methodology is applied?	ND	The proposed validation and verification bodies (VVBs) shall comply with Section 7 of the Cercarbono's Protocol for Voluntary Carbon Certification, Version 4.2, or its successor in future versions.
10	This methodology corresponds to the capture of biogas for the generation of thermal energy, electricity, and the production of biofuel to be injected into the grid or for on-site production or commercialisation. What happens when this biofuel is used by a company, how is it accounted for by the end user?	ND	In the methodology, as in any other methodology related to greenhouse gas (GHG) mitigation, emissions are reduced by the party where they are no longer generated, in this case the landfill. According to the above, the user would not be able to count the emission reductions as within his organisation, but as indirect emissions according to ISO 14064:2018-1 or as Scope 3 emissions under the GHG Protocol standard (GHG Protocol). However, the ownership of emission reduction certificates can be transferred or agreed at the outset to be granted to the user or client of a certain climate change mitigation project (CCMP), whereby an organisation could account for such reductions or offset its direct or Scope 1 emissions.
11	According to its scope, it is to be used for landfill, but I have talked to 2 clients (one in Argentina and one in Bucaramanga) who would like to obtain carbon credits for utilisation of food waste for food bank (Argentina) and crop residues for production of concentrates. This would be equivalent to a reduction in methane emissions, but not in landfill.	3 Purpose and field of application	Indeed, the object of application of this methodology (as stated in response to several of the comments above, specifically in Comment 3) is landfills, so the emission reductions generated from the activities described cannot be considered under this methodology. The potential GHG emission reduction in that case should be determined using an appropriate methodology for baseline setting and monitoring of activities that aim to keep food within the supply chain or similar object.
12	Could the scope of the methodology not be broadened to cover these types of activities?	3 Purpose and field of application	In congruence with the previous point, and with what was established in response to previous comments, the scope cannot be extended to these activities, as the scope of application is totally different from the object of the commented methodology, so a specific methodology or one that covers such activities should be proposed.