“Development of methodologies for the analysis of the composition of biogas, viability study of its reference material production, dissemination support through countries of South America and Central America in order to develop a renewable confident source of energy measurement”

Report

Regular Reporting on Subproject Progress

Reporting period: 1st Semester 2018 (2,0 year project)

Report No: 04

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1. **INTRODUCTION**

The increase of the prices and demands of energy, the stronger worries about the environmental impacts caused by fossil fuels, as well as the government incentives to increase the use of alternative sources of energy, promote a higher interest in renewable energies.

In particular, the biofuels are presented as an option to the fossil fuels and based on this; the production of different biofuels has been studied on a large scale, such as the bio-oil, bio-hydrogen and biogas.

The raw material used in the production of biogas is of organic origin, using materials such as manure (human and animal), and straw, bagasse and crop residues on harvested deposed landfill. This renewable energy source can be used as: electricity, vapor, fuel to boilers and stoves with quality gas.

In countries like Germany, China and India, among others, the biogas is already used in the energetic matrix. The need for reliable measurement results from biogas composition is well recognized within the Andean economies. The identified needs are common to countries like Mexico, Peru, Bolivia, Colombia, Argentina and Brazil.

This project objective is the improvement and assurance of the quality measurements for Biogas produced in Latin and Central America countries. In order to provide tools to guarantee the reliability of quality measurements of biogas, this project aims to develop and validate new methodologies by different chromatographic techniques for the characterization and quantification of the major components of biogas, as well as develop a viability study for the production of certified reference material of biogas.

2. **PERFORMED ACTIVITIES**

1. PTB IKZE send to all participants el report from the 7a. meeting using the CENTRA (12 / January / 2018)
2. PTB IKZE prepared the report from the Bogota meeting and send it to the participants on 11/January/2018
3. Karolyn Stams prepared the documentation for the purchase and for the donation of Biogas PRM and send it to all participants to revise and approve them.
4. PTB IKZE send to all participants el report from the 8a. meeting using the CENTRA (20 / March / 2018) and the documentation about the mixtures for the Proficiency Test.
5. VSL to confirm the details from the Biogas PRM purchase and send the PRM to the participants.
   The Biogas PRM for Inmetro got to Brazil on 31/March/2018, but the cylinders got to the laboratory only on April/2018.
6. Andreia Fioravante from Inmetro and Diana Ramírez from CENAM participated on the Biogas training at VSL - Holanda (09 to 13 / April / 2018). The Curvefit Software was acquired for Inmetro and Cenam.
7. Report of the training was made by Andreia Fioravante, was sent to PTB and shared with all the participants of the subproyecto
8. Andreia Fioravante ministrante the Curvefit software training at Inmetro on 16/May/2018.
9. Meeting held ( 07/June / 2018. About next steps. The gas cylinders have been received only by Brazil. Mexico is in process. In relation to training for Argentina and Bolivia, training will not be possible until the countries receive the cylinders. Training for Argentina at Inmetro probably in November 2018.
3. IMPLEMENTATION PROGRESS

Report on the progress in implementing the sub-project including Achievements/ Milestones (with regard to Indicators and Objectives); Challenges encountered and lessons learnt, justification for adjustment (if necessary)

The implementation progress of the Biogas project is on time. The original action plan was revised just because the beginning of the project (the first action started on Oct/2016), and the PRM order and purchase took a long time.

The first strategy of the action plan was finished. The second and the third action is in progress, as described below:

Actions finished:

1.1 Evaluate the information obtained by the NMI survey: identification of methods of analysis in the region; share information among participants to know their calibration and measurements capabilities, methods used. Cristiane R. Augusto prepared a report and will circulate among the participants and it will be discussing in the Bolivia meeting – Jan/2017.

1.2 Prepare the final list of participants in the meeting and the agenda and sending the agenda of the meeting to the NMIs and monitoring of participation (contacts, sending invitations ..) – It was done on Oct/2016.

1.3 Meeting to identify the most common detail demand in the region and in each country – Scheduled to Feb/2017

1.4 Emit a report of meeting describing the most common detail demand in the region and in each country, the capacity of each country to address these needs in order to establish indicators that can be reflected in the project, the NMI ranges of interest on the Biogas measurements, define the reference materials to be provide by PTB Support that will be used on the method validation and order these reference materials to each NMI. – Scheduled to Feb/2017.

1.5 Emit a report and present this report on the Bolivia Meeting

1.6 Coordinate the Bolivia Meeting

1.7 Emit an Excel table to compare the Biogas CRM quotes

1.8 Emit a report about the activities defined on the Bolivia Meeting and emit an Excel table with the activities defined at Bolivia Meeting – All the participants should develop these activities.

2.1 Order the Biogas PRM

2.2 Purchase the Biogas PRM

3.1 Develop a document with the activities and interested items to be aborded in the training

3.2. Training at VSL. Involve hands-on laboratory training of analysis of biogas primary reference material, measurements of the major components, estimation of measurement uncertainty and method validation.

Actions in progress:

2.3 Receive the Biogas PRM

2.4. Develop and implement the methodologies at the NMI (eg. Preparation, measurements, validation of the method) and validate the methodologies to Biogas measurements – waiting for the PRM

3.3. Disseminate hands-on training at Inmetro. Involve hands-on laboratory training of analysis of biogas primary reference material, measurements of the major components, estimation of measurement uncertainty and method validation.
4. **ADJUSTMENT REQUIRED**

The adjustment required was on the original action plan, because it described that the Project should begin on June/2016. It was revised and the first strategy (1.1) described was scheduled to begin on Oct/2016. At the Bolivia meeting, the action plan was revised to adjust (see the updated action plan).

As the Biogas PRM order and purchase took a long time, the action plan was revised to include an action related to this purchase. Because of this, the action plan was revised on December/2017.

The action plan need to be revised again on MAY/2018, because of the training that will be at Inmetro for INTI participant on November 2018 and a next training that will be at Bolivia for IBMETRO participant (this training will be ministrated by Diana Ramírez Flores – CENAM).

5. **NEXT STEPS**

<table>
<thead>
<tr>
<th>What?</th>
<th>Who?</th>
<th>When?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive the Biogas CRM inside the countries</td>
<td>All participants</td>
<td>March/2018, only Inmetro received the Biogas PRM on April/2018. The others participants did not received. In progress</td>
</tr>
<tr>
<td>Biogas training at INMETRO for INTI participant</td>
<td>INTI</td>
<td>Setember/2018</td>
</tr>
<tr>
<td>Biogas training at INMETRO for IBMETRO participant</td>
<td>IBMETRO</td>
<td>August-November 2018</td>
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</tbody>
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**ANNEX**

Updated Action Plan as annex