“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: 1\textsuperscript{st} Semester 2017 (1 year project)

Report No: 02

Prepared by

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05.July.2017
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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 deposited 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. 4a. meeting using the CENTRA: 16 / December / 2016
   Description: Meeting with all the project participants to present the agenda of the Bolivia meeting
   No. of participants: 5 participants - Beatriz Paniagua (iKZE), Cristiane Rodrigues Augusto Coordinadora de subproyecto (INMETRO-Brasil), Paola Avendaño (IBMETRO-Bolivia), Jorge Koelliker (CENAM-México), Adriana Rosso (INTI)
   Time: 1 h  Achievements: present the agenda of the Bolivia meeting and confirm with all the NMI participants that they need to send the survey that identify the Biogas Analysis demands to the coordinator until December 2016.

   Cristiane Rodrigues Augusto prepared the document “Concept: Meeting for identification the common demand and infrastructure between the NMI participants for traceable measurements of BIOGAS compounds” and send to all participants.

3. Meeting with all participants – 06 to 08 / February / 2017 at Cochabamba – Bolívia to attend the objectives: To present the results of the survey filled by each NMI that describes the internal capacities for biogas compounds measurements; To clarify the responsibilities and inputs of each participant (each country will present its own capabilities); To know the regulatory scheme of the biogas measurements in each country; To identify the demand of traceability according to the national needs; To present one basic infrastructure to development the biogas compounds analysis; To define the scope, indicators and the key parameters to be worked with; To define the
biogas compound ranges that the project will focus and define the standards required to analysis the biogas compounds; To improve the action plan in order to reach the indicators. Achievements: Definition of the need to develop traceable measurements results for biogas analysis. Know the internal infrastructure from each country that is participating in this project to develop the biogas analysis. Define analytics strategies to be implemented into the development to the biogas compounds measurement. And redefinition of the action plan.

4. Cristiane Rodrigues Augusto asked for Biogas CRM quotations to NMI: VSL, NL, IPQ and KRISS – this activity was started on 2 / March / 2017 to 19 / May / 2017 because it isn’t so easy to receive all the quotes that the project needs.

5. Cristiane Rodrigues Augusto prepared a Bolivian meeting report – March / 2017

6. All the participants send the natural gas method to Cristiane Rodrigues Augusto – February / 2017.

7. 5a. meeting using the CENTRA: 03 / May / 2017
   Description: Meeting with all the project participants to remember the participants that they need to present the activities that were defined at the Bolivia meeting
   No. of participants: 5 participants - Beatriz Paniagua (iKZE), Cristiane Rodrigues Augusto Coordinadora de subproyecto (INMETRO-Brasil), Paola Avendaño (IBMETRO-Bolivia), Jorge Koelliker (CENAM-México), Adriana Rosso (INTI).
   Time: 1 h
   Achievements: Remember the participants that they need to send the documents defined on the last Bolivia meeting and present the Biogas CRM quotes (quotes status).

8. Cristiane Rodrigues Augusto prepared an Excel with all the Biogas CRM quotes and send it to Angelika – May / 2017.

9. 6a. meeting using the CENTRA: 05 / July / 2017
   Time: 1 h
   Achievements: Remember the participants that they need to send the documents defined on the last Bolivia meeting, present the status of the Biogas CRM and define the training requirements.

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 first strategy of the action plan is in progress, as described below:

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 will prepare a report and will circulate among the participants and it will to 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 PTBSupport 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.

<table>
<thead>
<tr>
<th>Activities</th>
<th>NMI</th>
<th>When?</th>
<th>Last update 2017-05-03</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Send the natural gas methodology (a methodology similar to the biogas methodology that will be developed in the future)</td>
<td>INTI CENAM IBMETRO</td>
<td>February 2017</td>
<td>All NMI send the natural gas methodologies - INMETRO, INTI, CENAM and IBMETRO IB-PE-188 Calibración de mezclas de gas (2017-03-10)</td>
</tr>
<tr>
<td>2. Define the infrastructure to do services or prepare mixtures inside each NMI.</td>
<td>INTI CENAM IBMETRO INMETRO</td>
<td>April 2017</td>
<td></td>
</tr>
<tr>
<td>3. Define the users, for example: Biogas users, Gas mixtures (Praxair), Tecnology Institutes, Universities, Private Laboratories</td>
<td>INTI CENAM IBMETRO INMETRO</td>
<td>I Report – April 2017 Listed de usuarios II Report- June 2017 Seleccionados los usuarios factibles</td>
<td>INTI- 2017-04-11 send the report with the biogas users.</td>
</tr>
<tr>
<td>4. Update the action plan to each participant</td>
<td>INTI CENAM IBMETRO INMETRO</td>
<td>February 2017</td>
<td></td>
</tr>
<tr>
<td>5. Develop an action plan describing the expected results to identify: What: activity Who: INM and others when: time - confirmar con los tiempos estipulados en el marco del proyecto</td>
<td>INTI CENAM IBMETRO INMETRO</td>
<td>I Report – April 2017 Listed de usuarios II Report- June 2017 Seleccionados los usuarios factibles</td>
<td></td>
</tr>
<tr>
<td>6. Next CENTRA meetings</td>
<td>INTI CENAM IBMETRO INMETRO PTB</td>
<td>April 2017 June 2017</td>
<td></td>
</tr>
</tbody>
</table>

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)
5. **NEXT STEPS**

Table 1:

<table>
<thead>
<tr>
<th>What?</th>
<th>Who?</th>
<th>When?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finish the Biogas CRM order</td>
<td>Angelika</td>
<td>Aug/2017</td>
</tr>
<tr>
<td>Receive the Biogas CRM inside the countries</td>
<td>All participants</td>
<td>Oct/2017</td>
</tr>
<tr>
<td>Describe details to the Biogas Analysis Trainning</td>
<td>Cristiane</td>
<td>Jul - Aug/2017</td>
</tr>
</tbody>
</table>

**ANNEX**

Updated Action Plan as annex