

## GEF-MNRE-UNIDO Project

### Organic Waste Streams for Industrial Renewable Energy Applications in India

#### Expert Appraisal Group (EAG) Report - Inspection visit to the demonstration projects

##### Introduction

The GEF-MNRE-UNIDO project – Organic Waste Streams for Industrial Renewable Energy Applications in India launched its Financial Support Scheme on 10 August 2021 to promote innovative Industrial Organic Waste-to-Energy (IOWtE) biomethanation technologies and business models in India. The aim was to unlock investments in IOWtE projects and build the confidence of various stakeholders including industries, private investors, governments, banks, and financial institutions in IOWtE that it is a mature, feasible, and promising way of organic waste management for the sustainable energy transformation in India.

The Expert Appraisal Group (EAG) consisting of the following members was appointed to carry out the competitive evaluation of the applications received under the financial support scheme.

1. Mr Anand Kumar Jha, Deputy Secretary, Government of India, GP Division, Ministry of Petroleum and Natural Gas (MoPNG)
2. Mr D Adhikari, Executive Director, Chief Business Development and Joint Venture Group, ONGC
3. Prof. Satyanand Kar, Centre for Energy, Studies, Indian Institute of Technology (IIT), Delhi

The following four projects have been selected by the Project Executive Committee (PEC) based on the evaluation of the EAG.

1. M/s Cities Innovative Bio Fuels Pvt Ltd., Fatehgarh Sahib, Punjab
2. M/s SPS Bio-Chem Pvt Ltd., Yamunanagar, Haryana
3. M/s Metro Fuels, Hissar, Haryana
4. M/s Circle CBG India Pvt Ltd., Mawana, Meerut

##### Inspection of the project sites by the Expert Appraisal Group (EAG)

A three-day inspection visit of the EAG to the four project sites was organised from 19 to 21 September 2022 to review the overall status of the ongoing construction work on sites and assess the most feasible date of project completion. The compilation of the site inspection reports submitted by the EAG is as follows

###### A. Estimated timeline – completion of the projects

The completion timeline of the projects including the commercial operation at the designed output has been estimated in view of the intermediate milestones identified as following five stages

1. **Plant installation** – The complete installation of the project including all civil, fabrication, mechanical, electrical, plumbing and piping, and instrumentation work following the plant layout. Such as installation of the key equipment and machinery, peripherals including the control panels, measurement equipment, sensors, pumps, and valves, site landscaping including internal roads and lighting.
2. **Testing** – The commissioning, functional and operational testing all equipment and instrumentation including meters, valves, sensors, and operational interlocks designed as part of the automation. This is the prerequisite to start commissioning of the plant.
3. **Plant commissioning** – The complete charging of all anaerobic digesters with the microbial culture or the blend of feedstock and culture required to start the biogas generation and subsequently bio-CNG production.
4. **Commercial operation stage 1** – Bio-CNG production and sale of more than 65% of the designed capacity is achieved. Major innovations are successfully demonstrated.
5. **Commercial operation final stage** – Bio-CNG production and sale of more than 95% of the designed capacity is achieved. All innovations are successfully demonstrated. Production and sale of the Fermented Organic Manure (FOM) or value-added organic fertilizer commenced.

The compiled timeline of the four selected projects estimated by the EAG members is as below

**Timeline of the completion of the projects estimated by the EAG**

Project	EAG	Oct-2022	Nov-2022	Dec-2022	Jan-2023	Feb-2023	Mar-2023	Apr-2023	May-2023	Jun-2023	Jul-2023	Aug-2023	Sep-2023	Oct-2023	Nov-2023	Dec-2023	Jan-2024	Feb-2024	Mar-2024	Apr-2024	May-2024	Jun-2024	Jul-2024
1. M/s Cities Innovative Biofuels Pvt Ltd	IIT						1		2			3		4					5				
	MOPNG							1		2	3			4		5							
	ONGC							1		2	3		4					5					
2. M/s SPS Bio-Chem Pvt Ltd	IIT				1	2		3			4					5							
	MOPNG				1			2	3			4		5									
	ONGC				1	2		3			4					5							
3. M/s Metro Fuels	IIT								1		2		3			4					5		
	MOPNG												1		2	3			4			5	
	ONGC							1		2		3			4				5				
4. Circle CBG Pvt Ltd	IIT								1		2				3			4				5	
	MOPNG									1	2	3			4		5						
	ONGC								1		2				3			4					5

**Stages**

- 1 Plant installation
- 2 Testing
- 3 Plant commissioning
- 4 Commercial operation - stage 1 (65% of designed capacity)
- 5 Commercial operation - final stage (95% of designed capacity)

None of the four selected demonstration projects would be able to complete the Installation before 31 December 2022 which is the present deadline for the GEF-MNRE-UNIDO Project. All four projects may reach or complete the 4<sup>th</sup> stage which is 'Commercial operation – stage 1' by the end of 31 December 2023. Thereafter all four projects may require additional six months to complete the final stage of commercial operation successful commercial operation.

**B. Assessment matrix of the projects**

The EAG assessed the overall progress of the projects through visual observations during the site visits and on the merits of interactions with the project developer/owner. The project M/S SPS BIOCHEM Pvt Ltd rated them between 1 to 5.

Assessment Factors	1. M/s Cities Innovative Biofuels Pvt Ltd				2. M/s SPS Bio-Chem Pvt Ltd				3. M/s Metro Fuels				4. M/s Circle CBG India Pvt Ltd			
	IIT	MOPNG	ONGC	Avg	IIT	MOPNG	ONGC	Avg	IIT	MOPNG	ONGC	Avg	IIT	MOPNG	ONGC	Avg
Planning & Execution	4	4	4.5	4.2	5	4	5	4.7	3.5	3	3.5	3.3	4.5	4	4.5	4.3
Monitoring & Control	3.5	3	3.5	3.3	4.5	4	4.5	4.3	3.5	3	3.5	3.3	4.5	4	4.5	4.3
Implementation of Innovation	4	4	4	4.0	4	4	4	4.0	4	3	4	3.7	4	3	4	3.7
Quality of work	4	4	4	4.0	4.5	4	4.5	4.3	4	3	3.5	3.5	4.5	3	4.5	4.0
Overall Pace of Project Execution	3.5	3	3.5	3.3	4	4	4	4.0	3.5	3	3.5	3.3	4	3	4	3.7
<b>Total Score</b>	18.8				21.3				17.2				20.0			

Rating Notes: between 1-5 in the multiples of 0.5 (Appropriate - 1, Insufficient - 2, Acceptable - 3, Good - 4 and Excellent - 5)

**C. Comments of the EAG members**

Projects	EAG	Comments Verbatim
1. M/s Cities Innovative Biofuels Pvt Ltd	MOPNG	The developer is executing the civil work by themselves and have not engaged any PMC. At the time of visit, very few workers were seen. The work on the digester boxes (the innovation) was underway. Overall the quality looked good but the pace was slow.
	IIT	<ol style="list-style-type: none"> <li>1. Purchase orders should be verified for fast processing.</li> <li>2. For solar energy generation, planning (design, etc.) has not started yet.</li> <li>3. Extension is required.</li> </ol>

Projects	EAG	Comments Verbatim
	<b>ONGC</b>	<ol style="list-style-type: none"> <li>Solar PV plant planning has not been kicked-off.</li> <li>Purchase order/Purchase request need to be verified same can be requested from project proponent/developer</li> <li>Extension is required since dates declared by Project proponent/developer in their last presentation are optimistic, however ground progress suggests significant shift in timeline</li> </ol>
<b>2. M/s SPS Bio-Chem Pvt Ltd</b>	<b>MOPNG</b>	The PMC is closely monitoring the execution of the project. Some civil work is also underway like that of office building, control panel, gas upgradation facility, etc. But work on fertilizer unit (innovation) has not progressed much. Overall the quality looked good and the pace was satisfactory.
	<b>IIT</b>	<ol style="list-style-type: none"> <li>Purchase orders should be verified for fast processing.</li> <li>Extension is required.</li> </ol>
	<b>ONGC</b>	<ol style="list-style-type: none"> <li>Innovations are well thought, well designed &amp; well engineered</li> <li>Extension is required</li> <li>Purchase order/Purchase request need to be verified same can be requested from project proponent/developer</li> </ol>
<b>3. M/s Metro Fuels</b>	<b>MOPNG</b>	The civil work has just started. Work on one digester is going on. Rest still to begin. The developer is executing the civil work by themselves and have not engaged any PMC. At the time of visit, very few workers were seen. Overall the quality of work could not be ascertained as very little tangible work was there in ground. The pace looked slow.
	<b>IIT</b>	<ol style="list-style-type: none"> <li>Purchase orders should be verified for fast processing. Some of the</li> <li>PO still not processed.</li> <li>Digestors are under construction, and need fast construction.</li> <li>Extension is required.</li> </ol>
	<b>ONGC</b>	<ol style="list-style-type: none"> <li>Digester construction is underway, so overall pace of project execution is slow</li> <li>Innovations implementation has been initialized</li> <li>Purchase &amp; procurement process is not as per expectation</li> <li>Need to verify Purchase order/Purchase request</li> <li>Extension is required</li> </ol>
<b>4. M/s Circle CBG India Pvt Ltd</b>	<b>MOPNG</b>	The developer is executing the civil work by themselves and have not engaged any PMC. At the time of visit, very few workers were seen. The civil work on the digester is still going on and there is little civil work other than that of digestors. Quality of work appeared good. The aspect of innovation (the parallel and sequential digestors) was under construction. There was little tangible work on the zero liquid discharge facility. Overall the quality looked good but the pace was slow.
	<b>IIT</b>	<ol style="list-style-type: none"> <li>No PO placed till now.</li> <li>Digestors are under construction, and need fast construction.</li> <li>Extension is required.</li> <li>Delay in financing.</li> </ol>
	<b>ONGC</b>	<ol style="list-style-type: none"> <li>Extension is required</li> <li>Safety practices are at industry norms</li> <li>Delay in financial closure</li> <li>Implementation of Innovations well thought and well structured</li> <li>Digester is under construction</li> <li>PO need to be verified</li> </ol>