



**SQAC CERTIFICATION PVT.LTD.**

# Verification Report for

Project : Small Scale Cattle Biogas to Power Projects in Gujarat, Rajasthan, Karnataka, West Bengal, Chhattisgarh, Kerala and Haryana, India.

UCR Project ID : 017

Name of Verifier	SQAC Certification Pvt. Ltd.
Date of Issue	19/06/2023
Project Participant	Urja Bio System Pvt. Ltd., Pune, Maharashtra, India.
Work carried by	Mr. Santosh Nair
Work reviewed by	Mr. Praful Shinganapurkar

## **Summary:**

SQAC Certification Pvt. Ltd. has performed verification of the “Small Scale Cattle Biogas to Power Projects in Gujarat, Rajasthan, Karnataka, West Bengal, Chhattisgarh, Kerala and Haryana, India” for replacement or modification of anaerobic animal manure management systems in livestock farms to achieve methane recovery and gainful use of the recovered methane to generate captive power. The small scale project activities involve the installation of 9 independent biogas digesters between the 200 m<sup>3</sup> and 2000 m<sup>3</sup> capacity range, for serving the captive electricity needs at the location of the project activities. Fresh cattle dung is fed into the anaerobic digesters.

The project activity meets the following 7 major UN sustainable development goals (SDG's):



Verification for the period: **01/01/2018 to 31/10/2021 (3 years, 10 months).**

In our opinion, the total GHG emission reductions over the crediting / verification period stated in the Project Concept Note (PCN) / Monitoring Report (MR), submitted to SQAC are fairly stated.

Accredited by 5 Jupiter House, Callera Park, Aldermaston, Reading Berkshire RG7 8NN, United Kingdom (UK).

India Office: Off. No. 4, Fifth Floor, Buildmore Business Park, New Canca Bypass Road, Khorlim, Mapusa, Goa – 403 507

Web: [www.sqac.in](http://www.sqac.in)

Email: [info@sqac.in](mailto:info@sqac.in) Tel: 7219716786 / 87





The GHG emission reductions were calculated on the basis of UCR Biogas Protocol Standard Baseline which draws reference from AMS.I.C.: Thermal energy production with or without electricity and AMS-III.D: Methane recovery in animal manure management systems. The verification was done remotely by way of video calls / verification, phone calls and submission of documents for verification through emails.

SQAC is able to certify that the emission reductions from the “Small Scale Cattle Biogas to Power Projects in Gujarat, Rajasthan, Karnataka, West Bengal, Chhattisgarh, Kerala and Haryana, India” for the period 01/01/2018 to 31/10/2021 amount to 1,43,945 CoUs.

#### **Detailed Verification Report:**

##### **Purpose:**

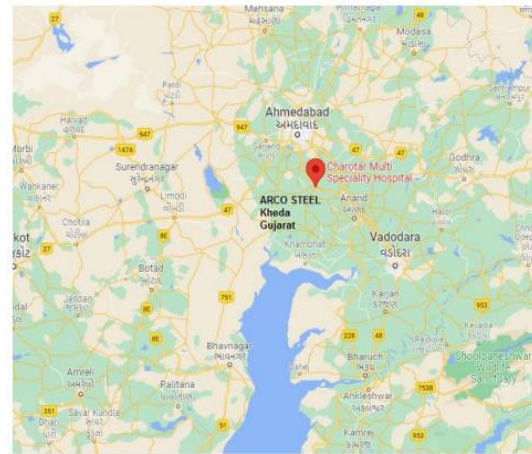
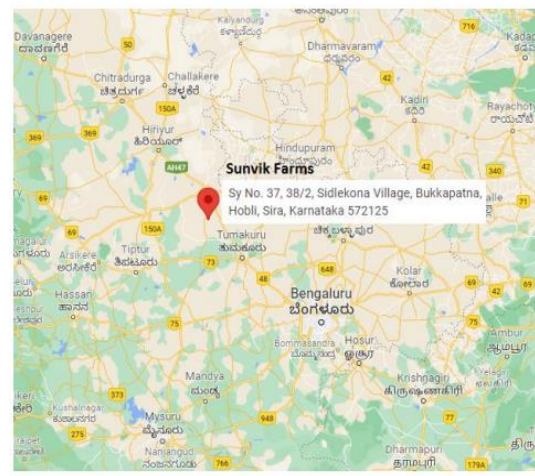
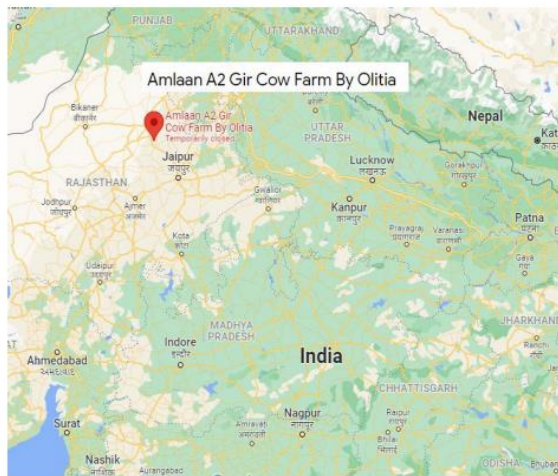
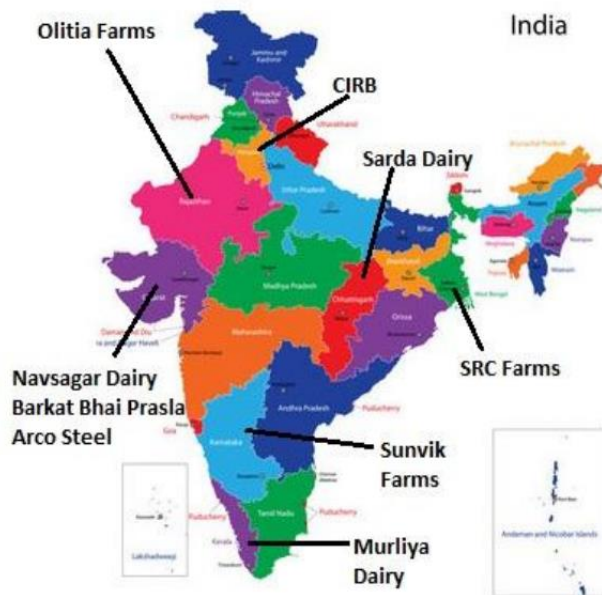
The Small Scale Cattle Biogas to Power Projects in Gujarat, Rajasthan, Karnataka, West Bengal, Chhattisgarh, Kerala and Haryana, India is located across the following Districts: Hisar, Dhanera, Palanpur, Kheda, Seekar, Hoogly, Tumkur, Trivendrum and Raipur, State: Gujarat, Rajasthan, Karnataka, West Bengal, Chhattisgarh, Kerala and Haryana, Country: India.

The small scale project activities involve the installation of 9 independent biogas digesters between the 200 m<sup>3</sup> and 2000 m<sup>3</sup> capacity range, for serving the captive electricity needs at the location of the project activities. Fresh cattle dung is fed into the anaerobic digesters.

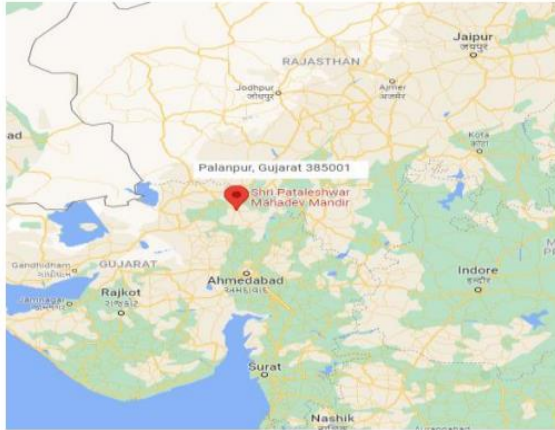
In the absence of the project activity, animal manure is left to decay anaerobically within the project boundary and methane is emitted to the atmosphere. The project activity recovers and utilizes biogas for producing electricity for captive use and hence displaces electricity from the grid using fossil fuels. The project activity hence avoids CH<sub>4</sub> and CO<sub>2</sub> emissions and is beneficial to the environment and community.

##### **Location of project activity:**

**Country** : India.  
**District** : Hisar, Dhanera, Palanpur, Kheda, Seekar, Hoogly, Tumkur, Trivendrum and Raipur  
**State** : Gujarat, Rajasthan, Karnataka, West Bengal, Chhattisgarh, Kerala and Haryana.









The operational domestic biogas units are in continuous operation after installation, with minor and major repairs as and when are reported by the project owner. Since the UCR protocol for biogas systems is based on a conservative 330 days a year operation, the project activity was never non-operational for a period of 35 days or more during any year of the monitoring period.

Name	Location Village	State	Capacity
CIRB , Sirsa Road	Hisar	Haryana	200 m3
Navsagar Dairy	Dhanera	Gujarat	300 m3
Barkat bhai prasla	Palanpur	Gujarat	2000 m3
Arco Steel	Kheda	Gujarat	400m3
Olitia Foods	Seekar	Rajasthan	200 m3
SRC Farms	Hooghly	West Bengal	400 m3
Sunvik Farms	Tumkur	Karnataka	1000 m3
Murliya Dairy	Trivendrum	Kerala	600m3
Sarda dairy	Raipur	Chhatisgarh	1200 m3

**Scope:**

The scope covers verification of emission reductions from the project Small Scale Cattle Biogas to Power Projects in Gujarat, Rajasthan, Karnataka, West Bengal, Chhattisgarh, Kerala and Haryana, India.

**Criteria:**

Verification criteria is as per the requirements of UCR Protocol Standard Baseline, AMS.I.C. Thermal energy production with or without electricity and AMS-III.D: Methane recovery in animal manure management systems.

**Description of project:**

The project activity involves the installation of 9 independent biogas digesters between the 200 m<sup>3</sup> and 2000 m<sup>3</sup> capacity range, for serving the captive electricity needs at the location of the project activities. Fresh cattle dung is fed into the anaerobic digesters. The high rate digester treats cattle dung under anaerobic condition and converts 50 % of organic carbon to produce Biogas.



Name	Location Village	State	Capacity	Commissioning Date
CIRB , Sirsa Road	Hisar	Haryana	200 m3	23-03-2018
Navsagar Dairy	Dhanera	Gujrat	300 m3	11-03-2019
Barkat Bhai Prasla	Palanpur	Gujrat	2000 m3	27-12-2018
Arco Steel	Kheda	Gujrat	400m3	26-09-2019
Olitia Foods	Seekar	Rajasthan	200 m3	01-12-2019
SRC Farms	Hooghly	West Bengal	400 m3	15-12-2018
Sunvik Farms	Tumkur	Karnataka	1000 m3	12-11-2019
Murliya Dairy	Trivendrum	Kerala	600m3	22-04-2020
Sarda dairy	Raipur	Chhatisgarh	1200 m3	09-07-2020

Year	2018	2019	2020	2021
Capacity Installed m <sup>3</sup>	200	2900	4500	6300

Name	Power Capacity Kwh
CIRB	24
Navsagar Dairy	50
Barkat Bhai Prasla	250
Arco Steel	50
Olitia Foods	24
SRC Farms	50
Sunvik Farms	120
Murliya Dairy	75
Sarda dairy	150
<b>Total</b>	<b>793</b>

Number Annually within PoA	2018	2019	2020	2021
Cattle	267	3867	6000	8400

By using the biogas captured from the digesters the project activity generates power for captive use. The project activity is the controlled biological treatment of biomass or other organic matters through anaerobic digestion in closed reactors equipped with biogas recovery for electricity generation and a combustion/flaring system.



The cattle dung from each dairy farm is collected from the cattle sheds within the project boundary and unloaded into the underground primary collection tank fitted with agitator to prepare homogenous slurry with a dry solid content of 20%. The dry solid content of the homogenous slurry is measured periodically in the laboratory for ensuring the percentage of the dry solid content.

The raw slurry from the underground RCC collection tank is fitted with submersible stirrer to homogeneously mix the substrate.

The technical specifications of the modified KVIC model bio-digesters are as follows:

Specification	Value
Total Installed Capacity	6300 m <sup>3</sup>
Mixing Proportion	(Water: Waste) 1:1
Number of units (digesters)	9
Feed Material	Cattle Dung
Biogas Power Installed Capacity	0.793 MW <sub>h</sub>
Working Days	330
Calorific Value Biogas	20 MJ/m <sup>3</sup>
Concentration of methane in the biogas	0.43008kg CH <sub>4</sub> /m <sup>3</sup> Applied an expected fraction of methane in biogas of 0.60 m <sup>3</sup> CH <sub>4</sub> /m <sup>3</sup> multiplied by the density of methane at normal conditions of 0.7168 kg/m <sup>3</sup>

The dairy farm owners in the project activity can be classified as small to medium-level farmers who are feeding a combination of green fodder and crop residues. Feed intake is typically measured in terms of gross energy (e.g., megajoules (MJ) per day) or dry matter (e.g., kilograms (kg) per day).

Type of waste	Digester Capacity Installed (total)
Cattle dung based	6300 m <sup>3</sup>

Type of waste	Estimated TPD treated in the digesters
Cattle dung based	126 TPD



**Processing of Treated Slurry:** The treated slurry is dewatered and the dry cake is used as high quality organic fertilizer.

**Biogas Storage System:** The biogas from all the digesters are collected in a gas storage facility and then sent to balloon holding chamber with a cumulative storage capacity of 6300m<sup>3</sup> in this project activity.

**Scrubbing System:** From the balloons, the raw biogas is sent to scrubbing containers that remove CO<sub>2</sub> and H<sub>2</sub>S gases and provide the raw biogas with a methane content of approximately 60%. This purified CH<sub>4</sub> is then typically stored in another balloon chamber for further usage.

**Power Generation:** The scrubbed biogas is then sent to biogas generators which is typically a spark ignition inter-cooler engine generator. The genset capacities in the project sites ranges between 24 kwh to 250 kwh with a total number of 9 generators installed within the project activities. The electrical efficiency is about 38% of each generator.






The total GHG emission reductions achieved in this monitoring period is as follows:



<b>Summary of the Project Activity and ERs generated for the entire Monitoring Period</b>	
Start date of this Monitoring Period	01/01/2018
Carbon credits claimed up to	31/10/2021
Total ERs generated over the Monitoring period (tCO <sub>2eq</sub> )	1,43,945 tCO <sub>2eq</sub>
Leakage	NA



## United Nations Sustainable Development Goals:

Positive contribution of the project to the following Sustainable Development Goals:

SDG	Impact
 <p>Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture</p>	<ul style="list-style-type: none"> <li>Restoring soils through the recycling of nutrients, organic matter, and carbon</li> <li>Increasing crop yields through use of nutrient-rich digestate biofertiliser</li> <li>Recirculating phosphorus, which is essential for the growth of plants but limited in supply</li> </ul>
 <p>Goal 3: Ensure healthy lives and promote well-being for all at all ages</p>	<ul style="list-style-type: none"> <li>Reducing air pollution by substituting fossil fuel with biogas</li> <li>Treating and recycling sewage and organic wastes to reduce odours and the spread of diseases</li> </ul>
 <p>Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all</p>	<ul style="list-style-type: none"> <li>Reducing dependence on fossil-fuel-based energy sources by replacing with biogas</li> <li>Utilising locally produced wastes and crops to generate energy for rural and remote communities. The project activity treats <b>126 tonnes per day (TPD) of cattle dung</b> that would have otherwise been left to decay anaerobically</li> <li>Storing biogas to produce energy when required</li> <li>Methane, constituting about 55–60% of landfill gas, is utilized to increase the share of renewable energy in the global energy mix</li> </ul>
 <p>Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation</p>	<ul style="list-style-type: none"> <li>Improving the self-sufficiency and sustainability of industries by extracting the energy from local waste and effluents and using it for the generation of renewable clean fuels.</li> <li>Collaboration between industries and agriculture for mutual benefit</li> <li>Generating short-term construction employment and long-term equipment manufacturing and maintenance employment.</li> </ul>
 <p>Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable</p>	<ul style="list-style-type: none"> <li>Preventing spread of diseases through collection and proper management of organic cattle waste</li> <li>Improving sanitation and hygiene through decentralised and local treatment of biosolids</li> <li>Improving urban air quality by substituting fossil fuel with biomethane in vehicles</li> <li>Reducing greenhouse gas emissions by using biogas-based renewable energy in the transportation industry</li> </ul>

	<ul style="list-style-type: none"> <li>• Reducing carbon dioxide emissions by replacing fossil-fuel-based energy sources with biogas and commercial fertilisers with digestate biofertiliser</li> <li>• Reduction of methane and nitrous oxide emissions from livestock manures</li> <li>• Reduction of methane and generation of renewable energy from other organic wastes</li> <li>• Capturing emissions from landfills</li> </ul>
<p>Goal 13: Take urgent action to combat climate change and its impacts</p>	
	<ul style="list-style-type: none"> <li>• Recirculating nutrients and organic matter in organic wastes through AD and returning them to the soil in the form of digestate biofertiliser</li> </ul>
<p>Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss</p>	

### Level of Assurance:

The verification report is based on the information collected through interviews conducted over video calls / phone calls, supporting documents provided during the verification, Project Concept Note (PCN) / Monitoring Report (MR), submitted to SQAC. The verification opinion is assured provided the credibility of all the above.

### Verification Methodology:

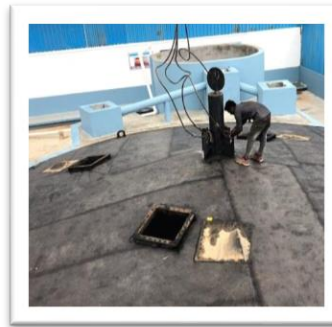
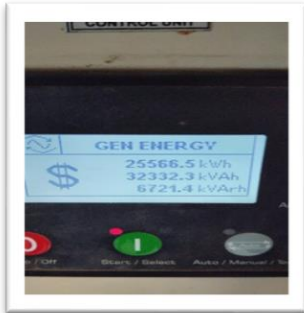
Review of the following documentation was done by SQAC Verifier, Mr. Santosh Nair, who is experienced in such projects.

- Project Concept Note (PCN)
- Monitoring Report (MR)
- Calibration Report
- Gas Generation Data
- Project Data Sheet
- Power Generation Report

### Sampling Method:

Not applicable.

Verification of all 9 independent biogas digesters was done.






## Persons interviewed:

1. Dr. Mukesh Raina
2. Mr. Santosh Wayande

## Documentation Verified:



- Project Concept Note (PCN)
- Monitoring Report (MR)
- Calibration Report
- Gas Generation Data
- Project Data Sheet
- Power Generation Report
- Work orders for setting up Biogas Plant

  
**URJA BIO SYSTEM PVT.LTD.**  
WASTE TO ENERGY SOLUTIONS

**TO WHOM SO EVER IT MAY CONCERN**  
**Calibration Report for the Year 2021**


Client	Location	Serial Number Meter electricity meters Captive Use of Electricity	Flare System/Pressure Gauge/Biogass Temperature	Power Genset Details
Mr. Barkat bhai Parsla Commissioned Date: 27-12-2018	Gujarat	Meter No: 254154793 Accuracy class 0.2S. Meters are digital and do not require calibration, only verification of their accuracy. Accuracy test at least once every 4 (four) years since commissioning. Last tested on: 25- 12-2021	Calibration is done internally on a weekly basis by project owners	Capacity:2500KWH Make: L&T Ltd Specs:3 phase static Meter

Regards,

M/s Urja Bio System Pvt. Ltd.



**Register Office :**  
D-503, DSK Vrindavanam, Near DSK Toyota Showroom, Model Colony, Shivaji Nagar, Pune - 411016.  
Tel.: +91 20 29706060 / 6161 | projects@urjabiosystems.com  
www.urjabiosystems.com | www.urjabiosystem.in  
CIN - U40106PN2012PTC143349

  
**URJA BIO SYSTEM PVT.LTD.**  
WASTE TO ENERGY SOLUTIONS

**TO WHOM SO EVER IT MAY CONCERN**  
**Calibration Report for the Year 2021**

Client	Location	Serial Number Meter electricity meters Captive Use of Electricity	Flare System/Pressure Gauge/Biogass Temperature	Power Genset Details
Muralya Dairy Commissioned Date: 22-04-2020	Hyderabad	Meter No: 547818739 Accuracy class 0.2S. Meters are digital and do not require calibration, only verification of their accuracy. Accuracy test at least once every 4 (four) years since commissioning. Last tested on: 30- 12-2021	Calibration is done internally on a weekly basis by project owners	Capacity:180KWH Make: L&T Ltd Specs:3 phase static Meter

Regards,

M/s Urja Bio System Pvt. Ltd

**Register Office :**  
D-503, DSK Vrindavanam, Near DSK Toyota Showroom, Model Colony, Shivaji Nagar, Pune - 411016.  
Tel.: +91 20 29706060 / 6161 | projects@urjabiosystems.com  
www.urjabiosystems.com | www.urjabiosystem.in  
CIN - U40106PN2012PTC143349



**TO WHOM SO EVER IT MAY CONCERN**  
**Calibration Report for the Year 2021**

Client	Location	Serial Number Meter electricity meters Captive Use of Electricity	Flare System/Pressure Gauge/Biogas Temperature	Power Genset Details
Navsagar Dairy Farm Commissioned Date: 11/03/2019	Dhanera, Gujarat	Meter No: 548243172 Accuracy class 0.25. Meters are digital and do not require calibration, only verification of their accuracy. Accuracy test at least once every 4 (four) years since commissioning. Last tested on: 30- 12-2021	Calibration is done internally on a weekly basis by project owners	Capacity:500KWH Make: L&T Ltd Specs:3 phase static Meter

Regards,



M/s Urja Bio System Pvt. Ltd.

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CIN - U40106PN2012PTC143349



**TO WHOM SO EVER IT MAY CONCERN**  
**Calibration Report for the Year 2021**

Client	Location	Serial Number Meter electricity meters Captive Use of Electricity	Flare System/Pressure Gauge/Biogas Temperature	Power Genset Details
Olitia Foods Pvt. Ltd Commissioned Date: 01-12-2019	Sikar, Rajasthan	Meter No: 534879678 Accuracy class 0.25. Meters are digital and do not require calibration, only verification of their accuracy. Accuracy test at least once every 4 (four) years since commissioning. Last tested on: 25- 12-2021	Calibration is done internally on a weekly basis by project owners	Capacity:250KWH Make: L&T Ltd Specs:3 phase static Meter

Regards,



M/s Urja Bio System Pvt. Ltd.

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CIN - U40106PN2012PTC143349



**TO WHOM SO EVER IT MAY CONCERN**  
**Calibration Report for the Year 2021**

Client	Location	Serial Number Meter electricity meters Captive Use of Electricity	Flare System/Pressure Gauge/Biogas Temperature	Power Genset Details
Sarda Dairy Commissioned Date: 09-07-2020	Raipur, Chhattisgarh	Meter No: 347816794 Accuracy class 0.25. Meters are digital and do not require calibration, only verification of their accuracy. Accuracy test at least once every 4 (four) years since commissioning. Last tested on: 30- 12-2021	Calibration is done internally on a weekly basis by project owners	Capacity:1500KWH Make: L&T Ltd Specs:3 phase static Meter

Regards,



M/s Urja Bio System Pvt. Ltd.

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www.urjabiosystems.com | www.urjabiosystem.in  
CIN - U40106PN2012PTC143349



**TO WHOM SO EVER IT MAY CONCERN**  
**Calibration Report for the Year 2021**

Client	Location	Serial Number Meter Electricity meters Captive Use of Electricity	Flare System/Pressure Gauge/Biogas Temperature	Power Genset Details
SRC Farm Ltd Commissioned Date: 15/12/2018	Hyderabad	Meter No: 534879678 Accuracy class 0.25. Meters are digital and do not require calibration, only verification of their accuracy. Accuracy test at least once every 4 (four) years since commissioning. Last tested on: 30- 12-2021	Calibration is done internally on a weekly basis by project owners	Capacity:180KWH Make: L&T Ltd Specs:3 phase static Meter

Regards,



M/s Urja Bio System Pvt. Ltd.

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www.urjabiosystems.com | www.urjabiosystem.in  
CIN - U40106PN2012PTC143349





  
**प्रारूप 1**  
**पंजीकरण प्रमाण-पत्र**

कॉर्पोरेट पहचान संख्या : U15122CT2011PTC000089 2011 - 2012

मैं एतद्वारा सत्यापित करता हूँ कि मैसर्स  
Sarda Dairy & Food Products Private Limited

का पंजीकरण, कम्पनी अधिनियम 1956 (1956 का 1) के अंतर्गत आज किया जाता है और यह कम्पनी प्राइवेट लिमिटेड है।

यह निगमन-पत्र आज दिनांक बीस दिसम्बर दो हजार ग्यारह को छठीसगढ़ में जारी किया जाता है।

**Form 1**  
**Certificate of Incorporation**

Corporate Identity Number : U15122CT2011PTC000089 2011 - 2012  
I hereby certify that Sarda Dairy & Food Products Private Limited is this day incorporated under the Companies Act, 1956 (No. 1 of 1956) and that the company is private limited.

Given at Chhattisgarh this Thirtieth day of December Two Thousand Eleven

Registrar of Companies, Chhattisgarh  
कम्पनी रजिस्ट्रार, छत्तीसगढ़

\*Note: The corresponding form has been approved by SK AGARWAL, Registrar of Companies and this certificate has been digitally signed by the Registrar through a system generated digital signature under rule 5(2) of the Companies (Electronic Filing and Authentication of Documents) Rules, 2006.  
The digitally signed certificate can be verified at the Ministry website (www.mca.gov.in).

कम्पनी रजिस्ट्रार के कार्यालय अभिलेख में उपलब्ध पताका का पता :  
Mailing Address as per record available in Registrar of Companies office:  
Sarda Dairy & Food Products Private Limited  
VANLIYA BHAWAN, 1ST FLOOR, SAI NAGAR, DEVENDRA NAGAR ROAD,  
RAIPUR - 492001,  
Chhattisgarh, INDIA

  
**प्रारूप 1**  
**पंजीकरण प्रमाण-पत्र**

कॉर्पोरेट पहचान संख्या : U15200KL2010PTC026927 2010 - 2011

मैं एतद्वारा सत्यापित करता हूँ कि मैसर्स  
MURALYA DAIRY PRODUCTS PRIVATE LIMITED

का पंजीकरण, कम्पनी अधिनियम 1956 (1956 का 1) के अंतर्गत आज किया जाता है और यह कम्पनी प्राइवेट लिमिटेड है।

यह निगमन-पत्र आज दिनांक अठारह अक्टूबर दो हजार दस को मेरे हस्ताक्षर से इरुणाकुलम में जारी किया जाता है।

**Form 1**  
**Certificate of Incorporation**

Corporate Identity Number : U15200KL2010PTC026927 2010 - 2011  
I hereby certify that MURALYA DAIRY PRODUCTS PRIVATE LIMITED is this day incorporated under the Companies Act, 1956 (No. 1 of 1956) and that the company is private limited.

Given under my hand at Ernakulam this Twenty Eighth day of October Two Thousand Ten

Registrar of Companies, Kerala  
कम्पनी रजिस्ट्रार, केरल

कम्पनी रजिस्ट्रार के कार्यालय अभिलेख में उपलब्ध पताका का पता :  
Mailing Address as per record available in Registrar of Companies office:  
MURALYA DAIRY PRODUCTS PRIVATE LIMITED  
Space-1, Level-5, 3rd Floor, Trans Towers, Vazhuthacaud,  
Thrissur - 6895014,  
Kerala, INDIA

  
**GOVERNMENT OF INDIA**  
**MINISTRY OF CORPORATE AFFAIRS**  
Registrar of Companies, Jaipur  
G/6-7, Second Floor, Residency Area, Civil Lines

**Certificate of Incorporation**

[Pursuant to sub-section (2) of section 7 of the Companies Act, 2013 and rule 8 of the Companies (Incorporation) Rules, 2014]

I hereby certify that OLITIA FOODS PRIVATE LIMITED is incorporated on this Sixth day of January Two Thousand Fifteen under the Companies Act, 2013 and that the company is limited by shares.

The CIN of the company is U16139RJ2015PTC046855.

Given under my hand at Jaipur this Sixth day of January Two Thousand Fifteen.

RAMESH KUMAR MEENA  
Registrar of Companies  
Rajasthan

Mailing Address as per record available in Registrar of Companies office:  
OLITIA FOODS PRIVATE LIMITED  
C-5, BHAGRATH COLONY, CHOMU HOUSE,  
JAIPUR - 302001,  
Rajasthan, INDIA

  
**प्रारूप 1**  
**पंजीकरण प्रमाण-पत्र**

कॉर्पोरेट पहचान संख्या : U01403WB2013PTC191722 2013 - 2014

मैं एतद्वारा सत्यापित करता हूँ कि मैसर्स  
SRC FARMS PRIVATE LIMITED

का पंजीकरण, कम्पनी अधिनियम 1956 (1956 का 1) के अंतर्गत आज किया जाता है और यह कम्पनी प्राइवेट लिमिटेड है।

यह निगमन-पत्र आज दिनांक दो अप्रैल दो हजार तेरह को कोलकाता में जारी किया जाता है।

**Form 1**  
**Certificate of Incorporation**

Corporate Identity Number : U01403WB2013PTC191722 2013 - 2014  
I hereby certify that SRC FARMS PRIVATE LIMITED is this day incorporated under the Companies Act, 1956 (No. 1 of 1956) and that the company is private limited.

Given at Kolkata this Second day of April Two Thousand Thirteen.

Registrar of Companies, West Bengal  
कम्पनी रजिस्ट्रार, पश्चिम बंगाल

\*Note: The corresponding form has been approved by DIP NARAYAN CHOWDHURY, Assistant Registrar of Companies and this certificate has been digitally signed by the Registrar through a system generated digital signature under rule 5(2) of the Companies (Electronic Filing and Authentication of Documents) Rules, 2006.  
The digitally signed certificate can be verified at the Ministry website (www.mca.gov.in).

कम्पनी रजिस्ट्रार के कार्यालय अभिलेख में उपलब्ध पताका का पता :  
Mailing Address as per record available in Registrar of Companies office:  
SRC FARMS PRIVATE LIMITED  
361, PIPULPATI, P.O & DIST - HOOGHLY,  
HOOGHLY - 712103,  
West Bengal, INDIA



### **Applied methodologies and standardized baselines:**

SECTORAL SCOPE - 01 Energy industries (Renewable/Non-renewable sources)

13 Waste handling and disposal

TYPE I - Renewable Energy Projects

CATEGORY - **AMS-I.C.: Thermal energy production with or without electricity.**

This methodology comprises renewable energy technologies that supply users i.e. residential, industrial or commercial facilities with thermal energy that displaces fossil fuel use. These units include technologies such as energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.

#### **- AMS-III.D: Methane recovery in animal manure management systems**

Replacement or modification of existing anaerobic manure management systems in livestock farms, or treatment of manure collected from several farms in a centralized plant to achieve methane recovery and destruction by flaring/combustion or energetic use of the recovered methane.

### **Applicability of methodologies and standardized baselines**

- ❖ This project activity comprises measures to avoid the emissions of methane to the atmosphere from cattle dung within the project boundary.
- ❖ No methane recovery and destruction by flaring or combustion for gainful use takes place in the baseline scenario.
- ❖ The livestock population on the farm is managed under confined conditions.
- ❖ Manure or the streams obtained after treatment are not discharged into natural water resources (e.g., river or estuaries);
- ❖ Biogas is used for renewable power generation for captive use.
- ❖ The project activity is biogas power plant and is not a co-generation project.
- ❖ In the baseline scenario the retention time of manure waste in the anaerobic treatment system is greater than one month.



- ❖ Residual waste from the digestion is handled aerobically.
- ❖ The storage time of the manure after removal from the animal barns, including transportation, does not exceed 45 days before being fed into the anaerobic digester.
- ❖ Measures are limited to those that result in aggregate emission reductions of less than or equal to 60 kt CO<sub>2</sub> equivalent annually from all Type III components of the project activity.
- ❖ This is a small scale project with total electricity capacity of 0.793 MW which is not greater than small scale thresholds defined by the applied methodology I.C. under Type I – renewable energy project activity, i.e. the total installed electrical energy generation capacity of the project equipment does not exceed 15 MW.

### **Applicability of double counting emission reductions**

Each of the biogas unit is constructed within the project boundary. Each biogas unit has a unique ID, which is visible on the biogas unit and each power generator set has a unique ID and metering system. Agreement for Double Counting Avoidance from Project Participant has been provided duly signed on 19.06.2023.

### **Project boundary, sources and greenhouse gases (GHGs)**

The project boundary includes the physical, geographical site(s) of:

- The livestock.
- Animal manure management systems (including centralised manure treatment plant where applicable);
- Facilities which recover and use methane for power generation.



	Source	GHG	Included?	Justification/Explanation
Baseline	Methane Emissions from manure decay.	<b>CO<sub>2</sub></b>	<b>Included</b>	Major source of emission
		<b>CH<sub>4</sub></b>	<b>Included</b>	Major source of emission
	Emissions from electricity generated using fossil fuels	N <sub>2</sub> O	Excluded	Excluded for simplification. This is conservative
Project Activity	Co <sub>2</sub> Emissions from onsite electricity use	CO <sub>2</sub>	Excluded	Electricity is generated from collected biogas, hence these emissions are not accounted for.
	CH <sub>4</sub> Emissions from flaring of the biogas	<b>CH<sub>4</sub></b>	<b>Included</b>	Included in project emissions.
	CH <sub>4</sub> Emissions associated with anaerobic digesters	N <sub>2</sub> O	Excluded	Excluded for simplification. This is conservative

The project activity recovers and utilizes biogas for producing electricity and applies AMS IC methodology in addition to using a Type III component of a SSC methodology, hence any incremental carbon emissions occurring due to the implementation of the project activity is neglected.

### Establishment and description of baseline scenario (UCR Protocol)

The baseline scenario is the situation where, in the absence of the project activity, animal manure is left to decay anaerobically within the project boundary and methane is emitted to the atmosphere.

Baseline emissions ( $BE_{y1}$ ) are calculated by using the following option: a) Using the amount of the waste or raw material that would decay anaerobically in the absence of the project activity, with the most recent IPCC Tier 2 approach (please refer to the chapter 'Emissions from Livestock and Manure Management' under the volume 'Agriculture, Forestry and other Land use' of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories). For this calculation, information about the characteristics of the manure and of the management systems in the baseline is required. Manure characteristics include the amount of volatile solids (VS) produced by the livestock and the maximum amount of methane that can be potentially produced from that manure (Bo).

For renewable energy technologies that displace technologies using fossil fuels, the simplified baseline is the fuel consumption of the technologies that would have been used in the absence of



the project activity, times an emission factor for the fossil fuel displaced. Hence the baseline scenario is also electricity is imported from a grid.

The project proponent was not bound to incur this investment as it was not mandatory by national and sectoral policies. Thus, the continued operation of the project activity would continue to replace fossil fuel derived grid electricity.

**Annual Emission Reductions:**  $BE_y = BE_{y1} + BE_{generated,y} - PE_{flare} - PE_{AD,y}$

**BE<sub>y</sub>** = Total Baseline Emissions in a year.

**BE<sub>generated</sub>** = **EG<sub>y,generated</sub>** X **EF<sub>y,grid</sub>**

**BE<sub>grid</sub>** = Baseline emissions for the grid electricity displaced by the project in year y (tCO<sub>2</sub>e)

**EG<sub>y,grid</sub>** = Amount of grid electricity displaced by project in year y (MWh)

**EF<sub>y,grid</sub>** = Emission factor of the grid (t CO<sub>2</sub>e/MWh) = 0.9 (UCR Standard)

**BE<sub>y1</sub>** = **GWP<sub>CH4</sub>** X **D<sub>CH4</sub>** X **UF<sub>b</sub>** X **ΣMCF<sub>j</sub>** X **B<sub>0,LT</sub>** X **N<sub>LT,y</sub>** X **VS<sub>LT,y</sub>** X **MS%<sub>BI,j</sub>**

**VS<sub>LT,y</sub>** = (**W<sub>site</sub>** / **W<sub>default</sub>**) X **VS<sub>default</sub>** X **nd<sub>y</sub>**

Where:

**BE<sub>y1</sub>** = Using the amount of manure that would decay anaerobically in the absence of the project activity based on direct measurement of the quantity of manure treated together with its specific volatile solids (VS) content

**N<sub>LT,y</sub>** = Average number of animals of type LT in a year

**W<sub>site</sub>** = 275 kg Avg. Wt. at Site (cow) in kg

**W<sub>default</sub>** = 275 kg Avg. Default Wt. of (cow) as per IPCC for Dairy Cow in India.

**nd<sub>y</sub>** = Number of days in year y where the treatment was operational

**VS<sub>default\_cattle</sub>** = Volatile solids of livestock LT entering the animal manure management system in year y as per IPCC default for cattle in India

**UF<sub>b</sub>** = Model correction factor to account for model uncertainties (0.94) Default

**VS<sub>LTy</sub>** = Specific volatile solids content of animal manure from livestock type LT and animal manure management system j in year y (tonnes/tonnes, dry basis). (Cow=2.6). As per IPCC guidelines





$D_{CH_4}$  = CH<sub>4</sub> density (0.00067 t/m<sup>3</sup> at room temperature (20 °C) and 1 atm pressure)

$MCF_j$  = Annual methane conversion factor (MCF) for the baseline animal manure management system j (Dairy Cow = 5%), solid storage.

$B_{O,LT}$  = Maximum methane producing potential of the volatile solid generated for animal type LT (m<sup>3</sup> CH<sub>4</sub>/kg dm) in Indian Subcontinent (Cow =0.13). IPCC 2006 - IPCC Default Value taken for Indian Subcontinent

VS = Volatile Solids

The feed digestibility in the range of 50 to 60% has been considered as appropriate for this PoA. The production of volatile solids is very much dependent on the feed digestibility levels. Corresponding to the feed intake levels, the estimated dietary net energy concentration of diet of 5.5 MJ/kg

(NE<sub>ma</sub>) has been found appropriate considering the default Values for Moderate Quality Forage taken from IPCC 2006, Ch. 10, Vol. 4, Table 10.8 Page 10.23. Based on the above value, at 50 to 60% feed digestibility levels, the Dry Matter Intake comes around 49 kg/day for a 295kg cattle head as per the equation (Equation 10.18a in IPCC 2006 chapter 10, volume 4, Page 10.22) as follows:

$DMI = BM^{0.75} \times \{[(0.0119 \times NE_{ma}^2) + 0.1938]\} / NE_{ma}$  where:

DMI = Dry Matter Intake;

BM = Live Body Weight = Default Value of 275 Kg (as given in IPCC 2006 table 10.A.6, chapter 10, volume 4, Page 10.77 considered).

NE<sub>ma</sub> = estimated dietary net energy concentration of diet (Default Values for Moderate Quality Forage taken from IPCC 2006, Ch. 10, Vol. 4, Table 10.8 Page 10.23 = 5.5 MJ/kg)

VS<sub>Default, Cow</sub> is the value for the volatile solid excretion rate per day on a dry matter basis for a defined livestock population (kg dm/animal/day) = 2.6

$GWP_{CH_4} = 21$  is the default IPCC value of CH<sub>4</sub> applicable to the crediting period (tCO<sub>2</sub>e/t CH<sub>4</sub>)

### Project Emissions:

$PE_{flare,y}$  = Emissions from flaring of the biogas stream in the year y (tCO<sub>2</sub>e)

$PE_{flare,y} = GWP_{CH_4} \times \sum TM_{RG,h} \times (1 - \eta_{flare,h}) \times 0.001$

$PE_{AD,y}$  = Project Emissions associated with anaerobic digesters in year y (tCO<sub>2</sub>e)

$PE_{leakage} = \text{Nil}$



**PE<sub>transport</sub>** = Nil

Emissions from incremental transportation in the year y (t CO<sub>2</sub>e), and physical leakage is negligible since the dung is generated within the project boundary of all the sites in the PoA.

**PE<sub>power, y</sub>** = Nil.

No fossil fuel is used for power generation within the project boundary. The electricity generated for captive use. The use of the recovered biogas is within the project boundary and its output is monitored in order to ensure that the recovered biogas is actually destroyed. Project emissions on account of storage of cattle dung before being fed into the anaerobic digester is not accounted since the storage time of the dung after removal from the cattle shed, including transportation, does not exceed 24 hours before being fed into the anaerobic digester.

### Yearly baseline emission reductions (BE)

#### Type IC

Year	kwh Generated	Emission Reductions Type IC (tCO <sub>2</sub> )
2018	138240	124
2019	2566080	2309
2020	4498560	4048
2021	5709600	5138

#### Type IIID

Parameter	Unit	2018	2019	2020	2021
Emission Reductions $ER_y = (BE_y - PE_y - LE_y)_{AMS\ IIID} + (ER_y)_{AMS\ IC}$		1,906.00	27,609.00	42,838.00	59,973.00
Baseline Emissions $BE_y = GWP_{CH_4} \times D_{CH_4} \times UF_b \times \sum MCF_j \times B_{0,LT} \times N_{LT,y} \times VS_{LT,y} \times MS\%_{Bij}$		1,969.40	28,523.10	44,256.17	61,958.64
Project Emissions $PE_y = PE_{PL,y} + PE_{flare,y} + PE_{power} + PE_{transport,y} + PE_{storage} + PE_{AD,y}$		63.01	913.67	1,417.77	1,984.88



### Annual Emission Reductions

Year	Emission Reductions Type IC (tCO <sub>2</sub> )	Emission Reductions Type IIID (tCO <sub>2</sub> )	Total Emission Reduction (tCO <sub>2</sub> )
2018	124	1906	2030
2019	2309	27609	29918
2020	4048	42838	46886
2021	5138	59973	65111
			<b>143945</b>

**Total emission reductions (ER<sub>y</sub>) = 1,43,945 CoUs (1,43,945 tCO<sub>2eq</sub>)**

### Monitoring period number and duration

First Issuance Period: 3 years, 10 months – 01/01/2018 to 31/10/2021

### Conclusions:

Based on the audit conducted on the basis of UCR Biogas Protocol Standard Baseline which draws reference from AMS.I.C. Thermal energy production with or without electricity and AMS-III.D: Methane recovery in animal manure management systems, the documents submitted during the remote verification including the data, Project Concept Note (PCN) / Monitoring Report (MR), SQAC is able to certify that the emission reductions from the project - Small Scale Cattle Biogas to Power Projects in Gujarat, Rajasthan, Karnataka, West Bengal, Chhattisgarh, Kerala and Haryana, India, UCR ID- 017, for the period 01/01/2018 to 31/10/2021 amounts to 1,43,945 **CoUs (1,43,945 tCO<sub>2eq</sub>)**

Santosh Nair  
Lead Verifier (Signature)



Praful Shinganapurkar  
Senior Internal Reviewer  
(Signature)

Date: 19/06/2023