

Measurement, Reporting, and Verification (MRV) Best Practices for Biogas Projects

Part 3 in the Global Methane Initiative's MRV Webinar Series

24 May 2023

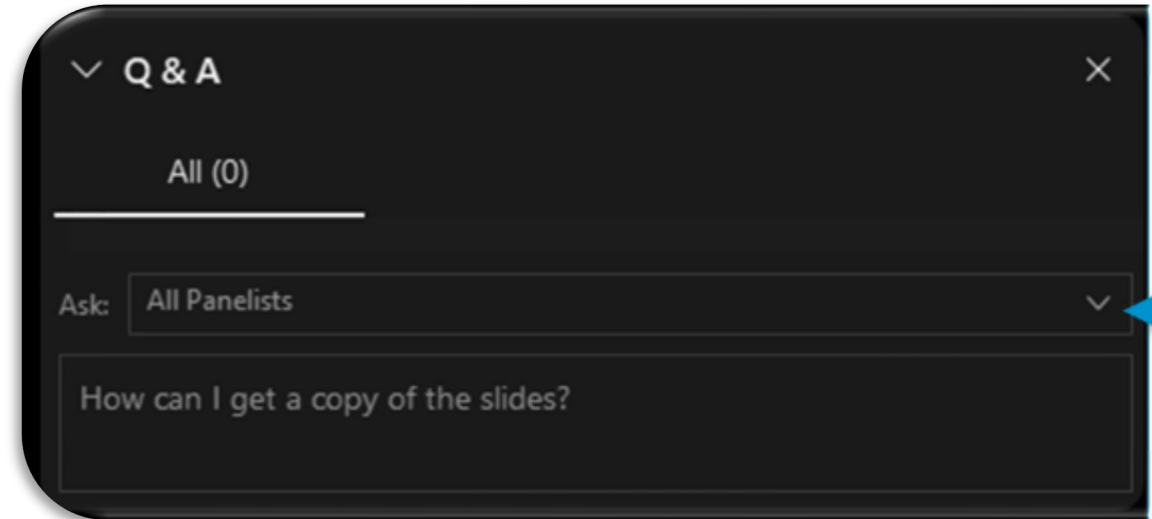
11:00 AM – 12:00 PM EDT (UTC -4)

globalmethane.org



Submit your questions during the presentation!

- Participants are muted
- **To ask a question:**
 1. Select “All Panelists” from the drop-down menu
 2. Enter your question in the question and answer (Q&A) box
 3. Select “Enter”
- Questions will be moderated at the end
- Recording and webinar slides will be posted to the GMI website (www.globalmethane.org)



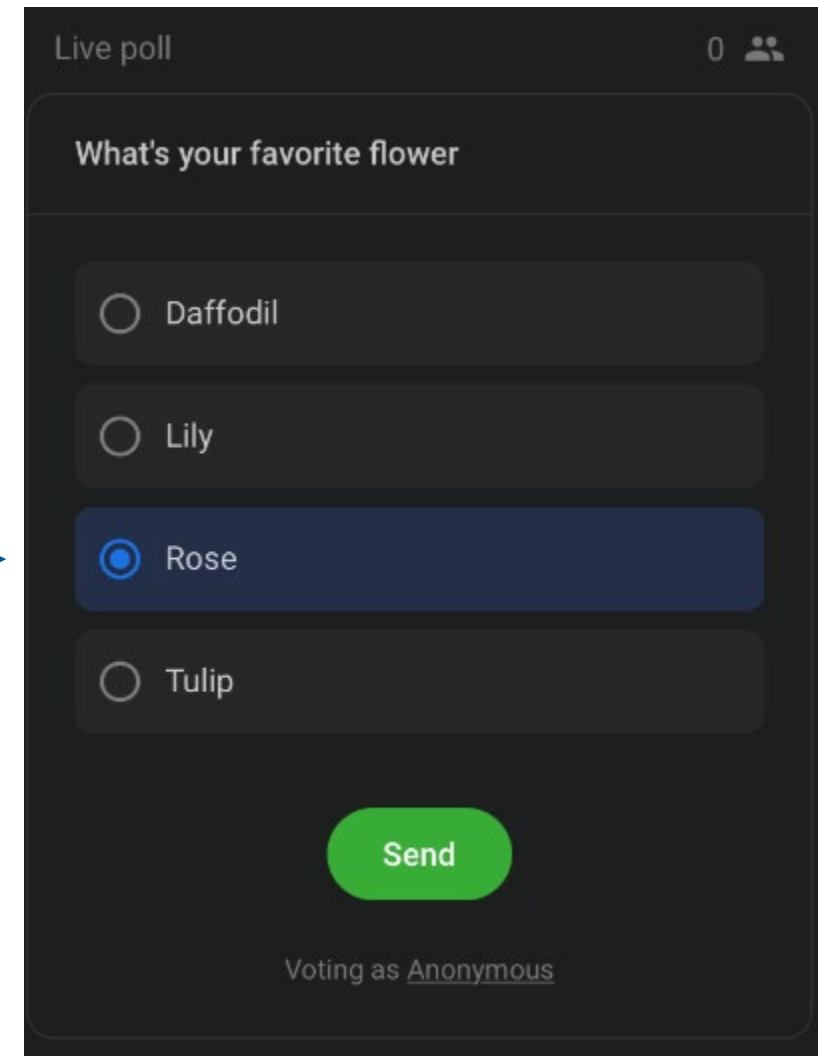
Polling and feedback

Polling

- We'll ask a poll question during the webinar
- The Slido panel will appear when we open the first poll
- Select your desired response and hit "Send"

Webinar Feedback

- A feedback form will pop-up in the Slido panel near the end of today's webinar with several questions
- Please make your selections and select "Send"



Live poll 0

What's your favorite flower

Daffodil

Lily

Rose

Tulip

Send

Voting as Anonymous

Speakers



Nick Elger
Program Manager
Climate Change Division
U.S. Environmental Protection Agency

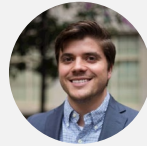


Gerardo Canales
Executive Director
ImpelmentaSur



Zach Eyler
Vice President
Ruby Canyon Environmental

Agenda



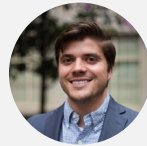
MRV Best Practices and GMI's Policy Maker's Handbook for MRV – Nick Elger



Best Practices for Measurement and Reporting – Gerardo Canales



Best Practices for Verification – Zach Eyer



Closing Remarks and Key Takeaways – Nick Elger



Q & A

Global Methane Initiative (GMI)

What is the Global Methane Initiative?

GMI is an international public-private partnership focused on reducing barriers to recovering and using methane as a valuable energy source.



How does GMI help Partner Countries develop and implement methane mitigation solutions?

GMI provides cost-free technical support to deploy methane-to-energy projects around the world.



What sectors does GMI focus on?

Biogas (agriculture, municipal solid waste, wastewater)

Coal Mines

Oil and Gas

globalmethane.org



- 46 Partner Countries
- 700+ Project Network members
- Alliances with international organizations focused on methane recovery and use

GMI Partner Countries represent approximately 75% of methane emissions from human activities.



Why Focus on the Biogas Sector?

- Biogas sector accounts for approximately **20% of global anthropogenic methane emissions**
- Biogas projects can help **capture and use the methane** and provide benefits for climate change mitigation, energy generation, and public health

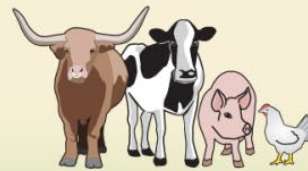
Example of Biogas Projects



Municipal Solid Waste

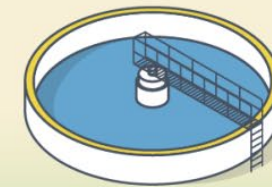
Landfill gas collection, control, and utilization

Anaerobic digestion of organic waste including food and green waste



Agriculture

Anaerobic digestion of livestock manure and crop residues



Municipal Wastewater

Anaerobic digestion of biosolids

Overview of MRV of Biogas Projects

MEASUREMENT

Tracking and documentation of data and information on GHG emissions and emissions reductions from a project. This can involve:

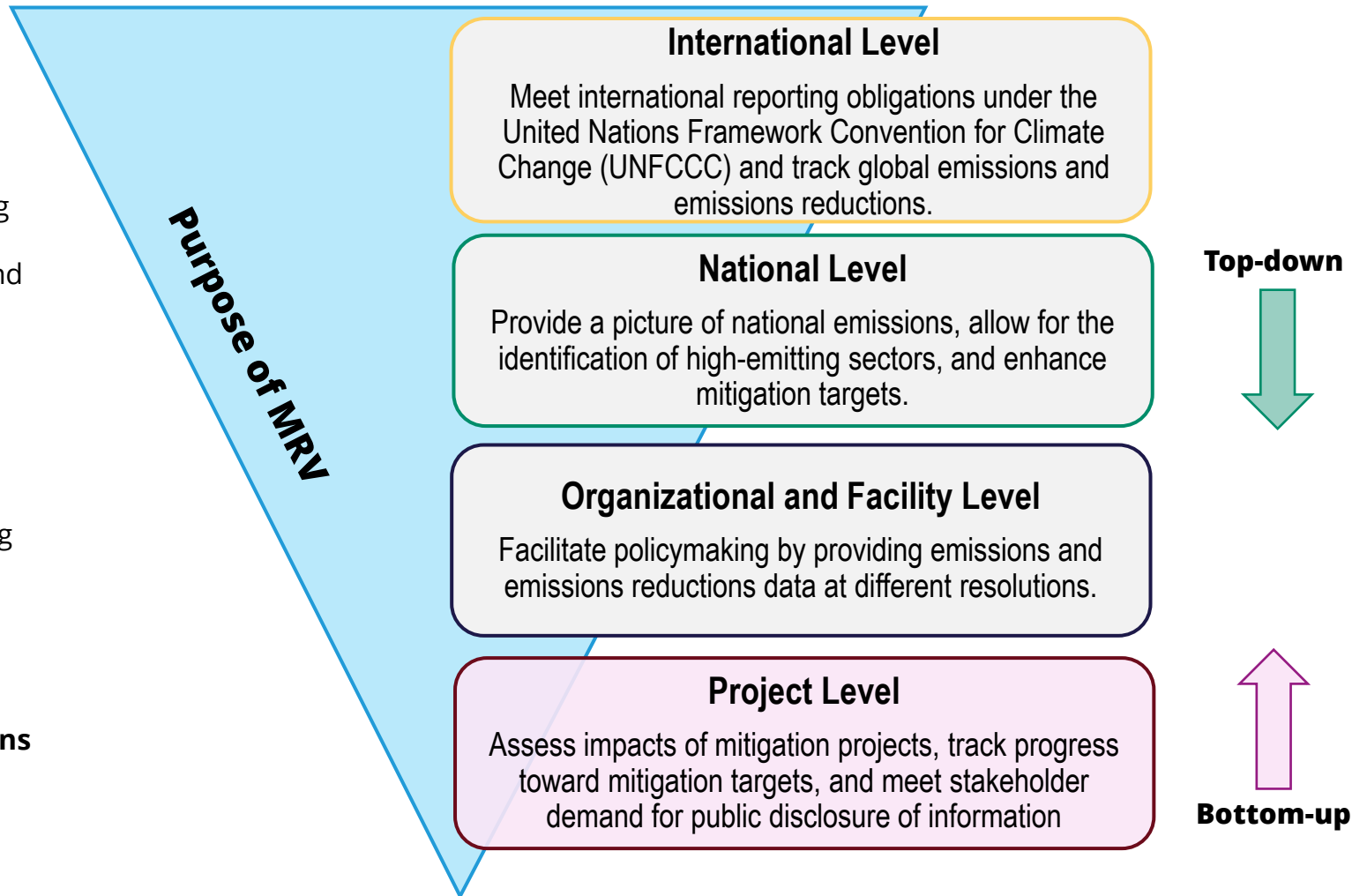
- Direct monitoring of emissions (e.g., using biogas flow meters)
- Modeling (e.g., using emissions factors and activity data to estimate emissions)
- Or a combination of both

REPORTING

Disseminating measured GHG emissions and emissions reduction data and information using standardized methods and formats.

VERIFICATION

Independently assessing reported GHG emissions and emissions reductions, typically through an independent, third-party verification body.



Policy Maker's Handbook for Measurement, Reporting, and Verification (MRV) in the Biogas Sector

Purpose

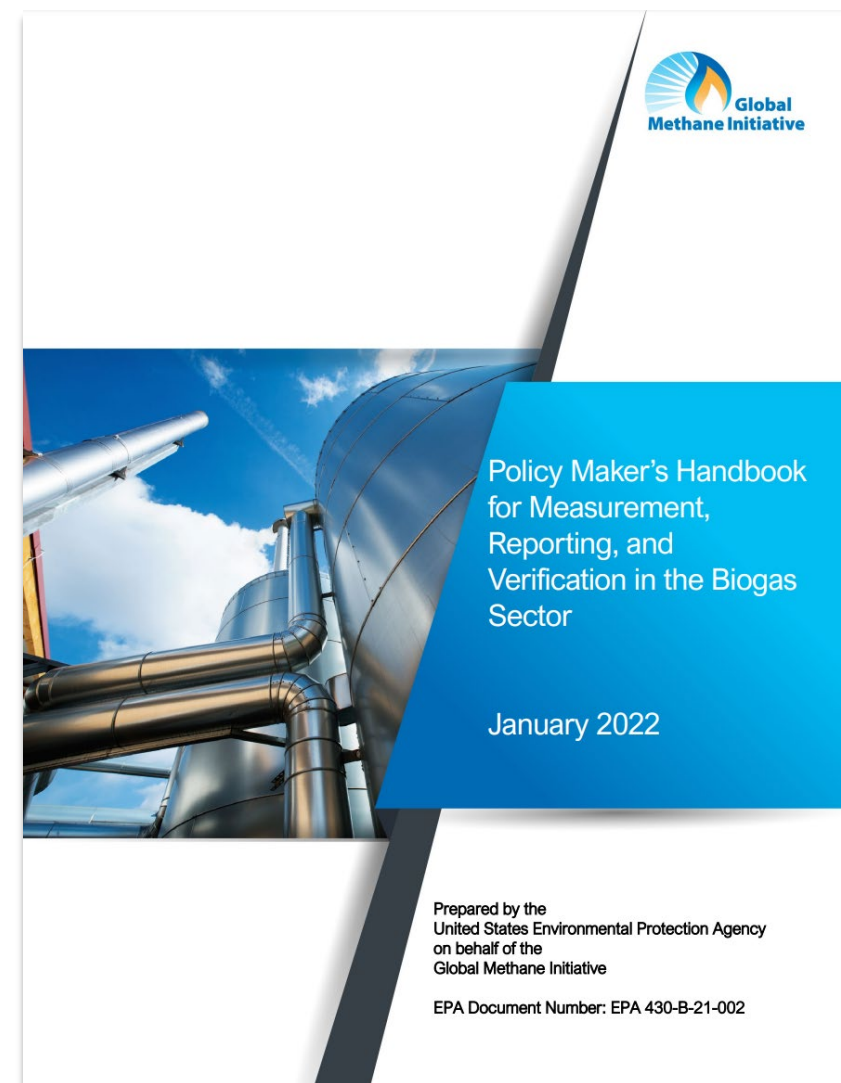
- **High-level resource** on guiding principles for conducting emissions MRV for the biogas sector
- **Support decision-makers** in incorporating project-level MRV into national-level frameworks and objectives

Scope

- **Biogas sector:** agriculture, municipal solid waste, and wastewater
- **Project-level activities** (e.g., anaerobic digestion projects and landfill gas projects) rather than broader-scale MRV
- **Type of MRV:** MRV of emissions and mitigation actions

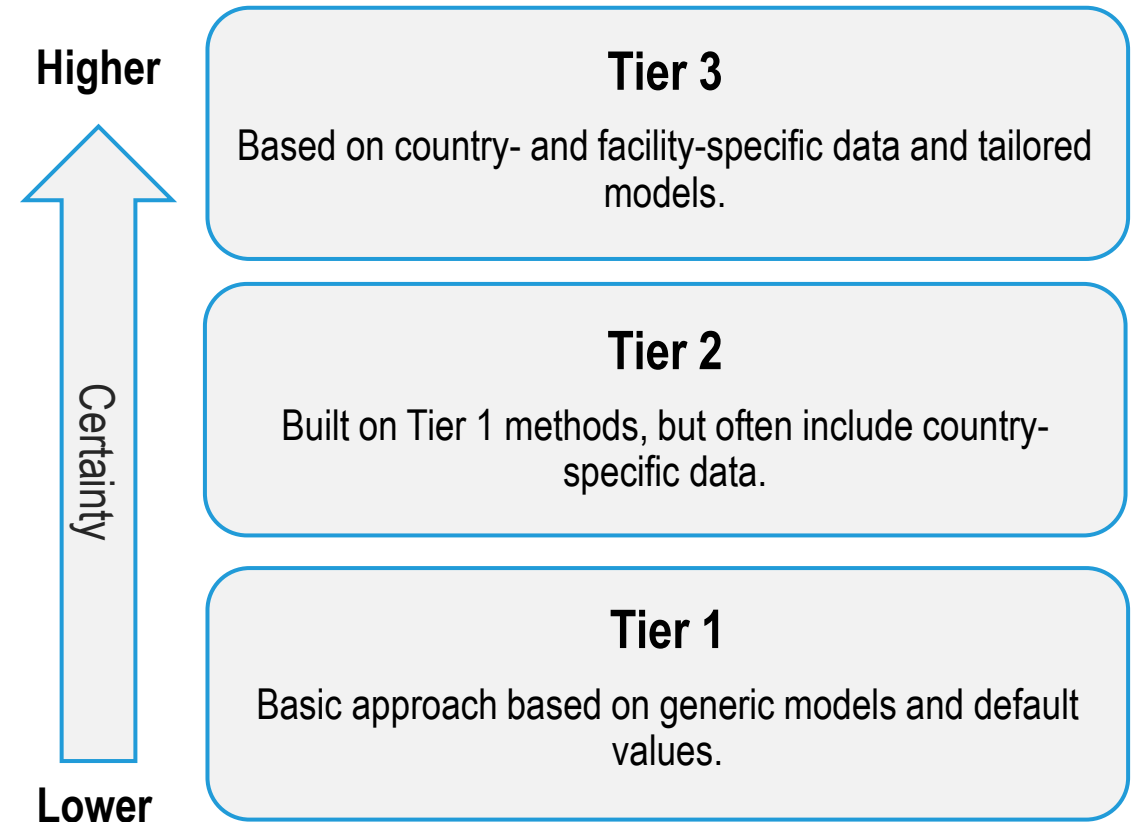
Approach

- **Draws on technical guidance and tools** from existing protocols (e.g., IPCC, EPA AgSTAR, California Air Resources Board) and knowledge from an expert review process



Uses of Project-Level MRV Data

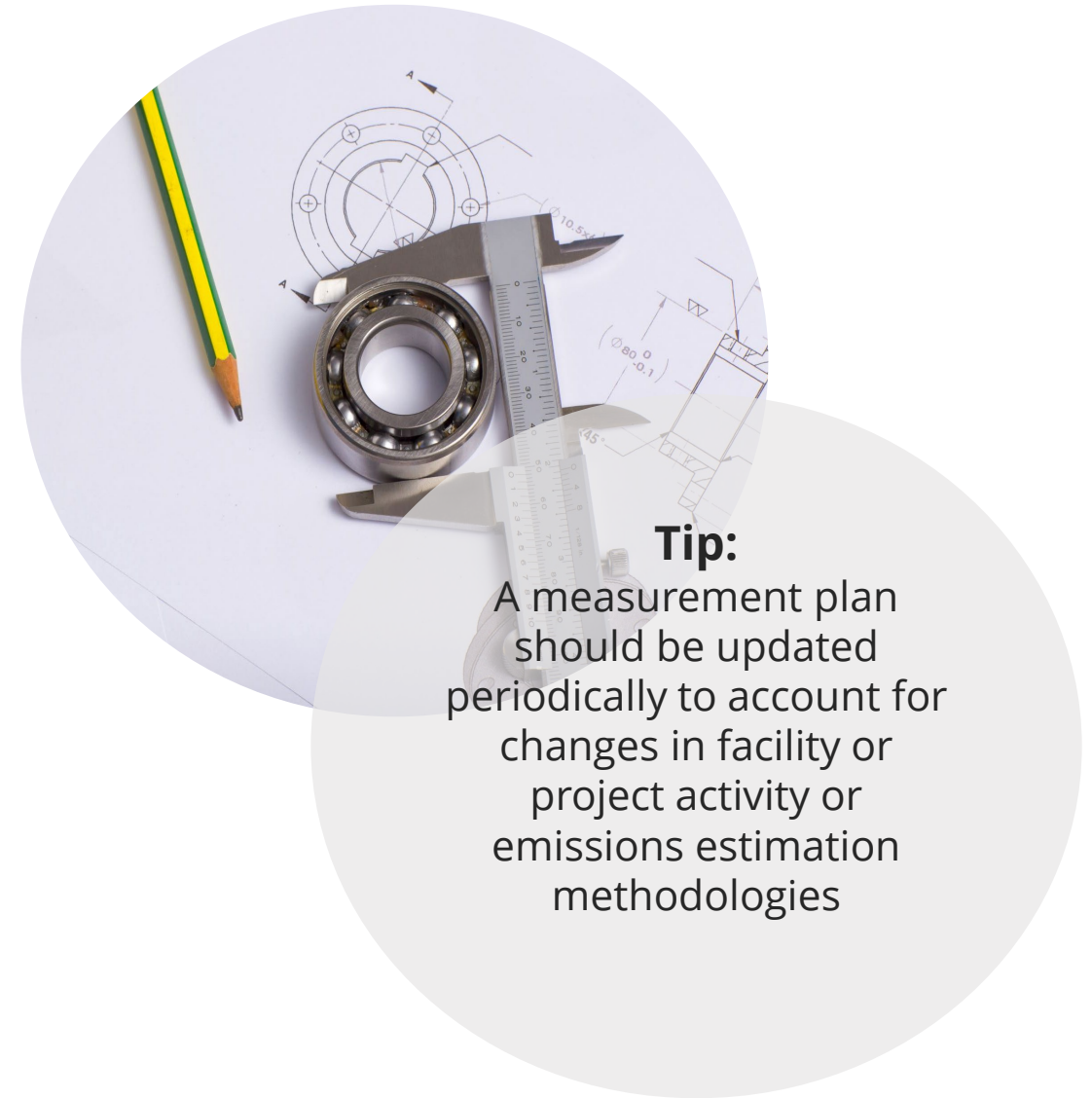
- **To develop national inventories:**
 - Many governments use Tier 1 methods in the biogas sector.
 - Project-level MRV data can be used to advance from Tier 1 to Tiers 2 and 3 by:
 - Refining methane recovery estimates
 - Developing country-specific emissions factors
 - Improving activity data
- **To enhance mitigation targets in nationally determined contributions (NDCs)**
- **Contribute to the achievement of Sustainable Development Goals**
- **Increase access to external funding sources**



Best Practices for Measurement

Develop a measurement plan

- A measurement plan provides facility personnel with key steps to collect and manage greenhouse gas (GHG) reduction data.
- Key elements of a measurement plan include:
 - An overview of the facility and operations
 - Roles and responsibilities of facility personnel
 - A description of GHG mitigation project/activities
 - GHG mitigation project measurement, including data to be collected, onsite equipment used to collect data, data collection process, etc.
 - GHG emissions reduction quantification methods and equations



Tip:

A measurement plan should be updated periodically to account for changes in facility or project activity or emissions estimation methodologies

Best Practices for Measurement

Quantify Emissions Reductions

- **Establish a business-as-usual emissions baseline** as a reference for estimating emissions reductions.
- Emissions can be estimated:
 - **Before project implementation (ex-ante).** Estimates based on modeling assumptions can be used in feasibility assessments or project proposals.
 - **After project implementation (ex-post).** Estimates based on real measurements from the project site tracks mitigation progress.
- Quantify GHG emissions **annually**.
- See **Exhibit C.1.** of the Handbook for a full list cost-free of biogas project emissions quantification tools



Tip 1:

Monitoring equipment (e.g., gas flow meters) should be maintained and calibrated to increase data accuracy and reduce uncertainties.

GMI's Solid Waste Emissions Estimation Tool is a cost-free tool that estimates emissions and emission reductions in the municipal solid waste sector. Download at www.globalmethane.org/SWEET

Best Practices for Reporting

Report emissions and emissions reductions data

- **Project operators can report emissions and emissions reductions data to:**
 - National government agencies, as required under national GHG emissions reporting programs
 - Local governments, as required for developing municipal emissions inventories
 - Voluntary programs (e.g., Carbon Disclosure Project)
 - Financial institutions or carbon offset program administrators
- The type of information to be reported, the level of detail, and the frequency of reporting will vary depending on the reporting program.



Tip:

Required information includes:

- Project name and contact information
- Project location
- Baseline emissions
- Time period of emissions reductions
- Proposed improvement plan

Best Practices for Verification

Verify emissions and emissions reductions

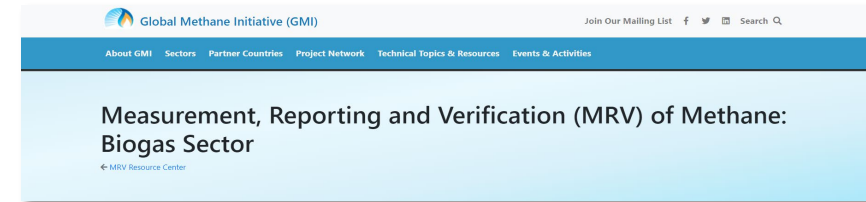
- GHG data and information should be verified by a third-party, accredited verification body to increase reliability.
- Verification should be conducted to a verification standard and criteria.
 - Verification standards for biogas projects are listed in **Exhibit A.3.** of the Handbook
 - Two common criteria when conducting verifications are materiality and level of assurance
- Verification may occur every other year, or every three years.



Verification process:

- Assessment of project boundaries, documentation checks, onsite inspections
- Review of measurement and metering methods and equipment
- Assessment of data collection and management systems
- Independent calculations of emissions reductions

Policy Maker's Handbook for Measurement, Reporting, and Verification (MRV) in the Biogas Sector



Measurement

From a bottom-up perspective, the most important component of MRV is the measurement of data. This core component provides the basis for claiming emissions reductions from the action(s) taken.

Develop a measurement plan

The main activity for measurement is the development and implementing a comprehensive measurement plan, including defining what data are checked for accuracy, and

Choose a method for quantifying emissions reductions

Methane emissions reductions should be quantified using ex-ante or ex-post methods. Ex-ante quantification involves estimating emissions reductions before project implementation (ex-ante) or after project implementation has begun (ex-post). The following sections describe both types of quantification in general terms. More information about how these types of quantification are applied to specific types of

- **Ex-ante quantification** involves estimating emissions reductions before project implementation (ex-ante) or after project implementation has begun (ex-post). The following sections describe both types of quantification in general terms. More information about how these types of quantification are applied to specific types of
- **Ex-post quantification** is based on measurement of emissions reductions after project implementation. This method is often required for offsets protocols.

Use established methodologies and tools

Using established methodologies – such as those based on IPCC GHG inventory guidelines – is considered a best practice. GMI provides several tools and resources for measuring emissions and emissions reductions for the biogas sector. Links to these tools and resources are provided below.

Keep accurate records and project documentation

In addition to emissions reductions data, it is important to document:

- Methodologies used to quantify emissions reductions
- GHGs included in the project's scope
- Activity data and how they are measured
- Baseline and any other underlying assumptions
- Sources of uncertainty
- Data sources
- Any data gaps associated with the period for which biogas mitigation efforts are quantified



Resolve data gaps and identify accurate data substitutes

Monitoring and data collection equipment will often fail or have interruptions during a monitoring period. Frequently, emissions mitigation programs will have specific requirements and methods to substitute for missing data.

Without specific guidance, projects should seek to use methods that are reasonable, supported by other data during the measurement period, and are conservative in nature.

IPCC Guidelines for National Greenhouse Gas Inventories include methods for resolving data gaps using techniques such as overlap, surrogate data, interpolation, and trend extrapolation.

Download the Handbook:

<https://globalmethane.org/resource/s/details.aspx?resourceid=5182>

Visit the MRV Resource Center:

<https://globalmethane.org/mrv>

Best Practices for Measurement and Reporting

Lessons Learned from the Reciclo Organicos Program

Gerardo Canales
Executive Director
ImplementaSur



OUR PURPOSE

We contribute to the design and implementation of sustainable and climate-resilient practices. We approach climate change with a systemic vision to transform its challenges into value-creating opportunities.



**Creating value from
climate change**



DIAGNOSIS

We develop indicators that allow organizations to identify their vulnerability to climate risks.



STRATEGY

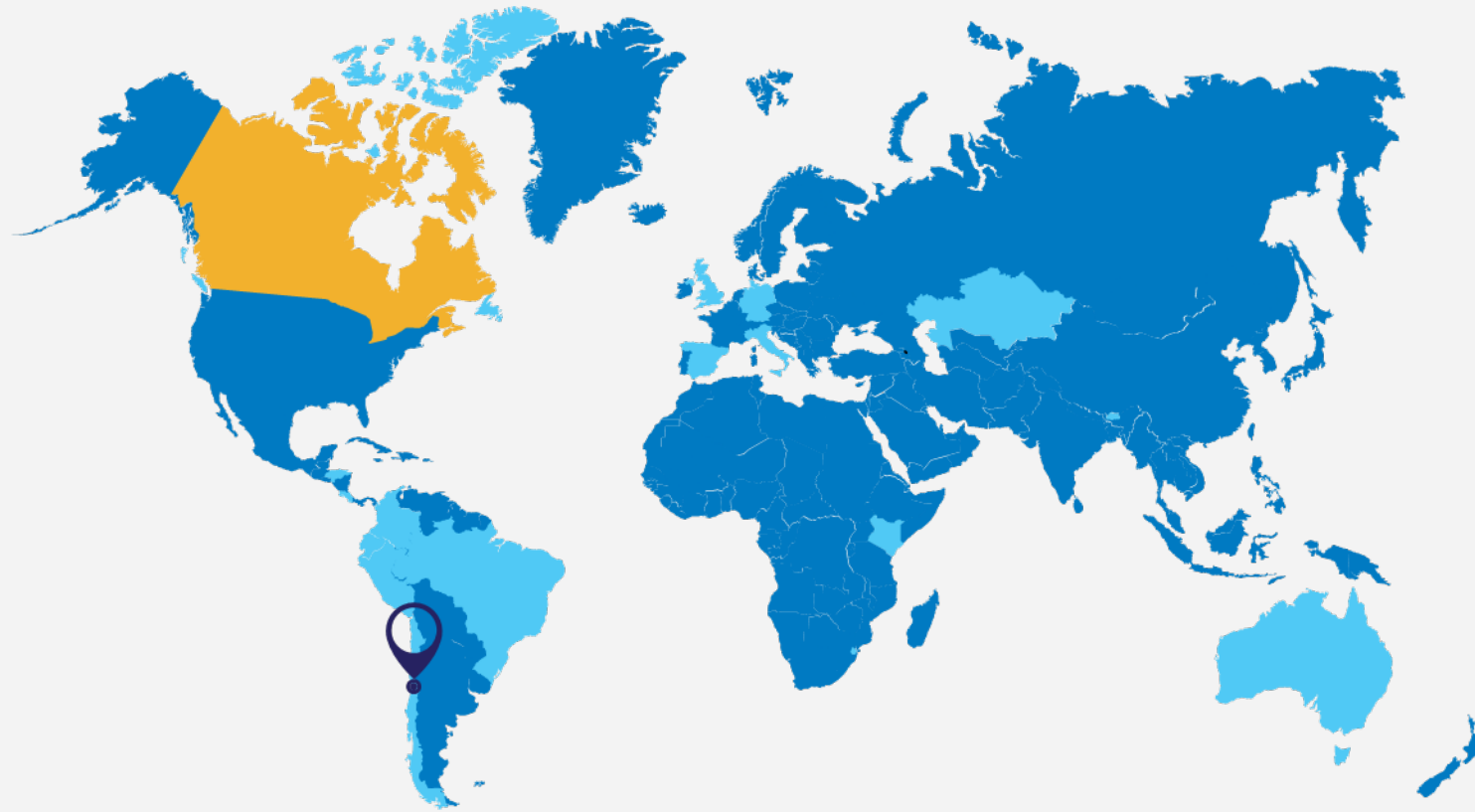
We build a detailed action plan with the most appropriate mitigation and adaptation measures for organizations to manage climate-related risks.



IMPLEMENTATION

We give technical assistance in designing business models, financing schemes, and public policy for mitigation and adaptation measures.

OUR EXPERIENCE



+ 15 countries
+ 50 clients
+150 projects



OUR CLIENTS

Public and international cooperation



Private





1

**MRV in
Chile**

2

**Reciclo
Orgánicos
Program and
MRV Protocols
developed**

3

**Blockchain
Applications**

1. MRV IN CHILE

1

MRV in Chile

2

Reciclo Orgánico's
MRV

3

Blockchain
applications

MRV in Chile

By 2022, there were 13 MRV initiatives implemented or under development in Chile:

- 3 classified as emissions initiatives.
- 5 classified as mitigation action initiatives.
- 5 MRV systems that address both emissions and mitigation actions.

Emissions: Emissions systems consider the monitoring of GHG emissions with a certain scope.

Mitigation actions: Mitigation action systems track mitigation, that is, the progress and/or effectiveness in the implementation of mitigation actions.

MRV in Chile: examples

HuellaChile Carbon Management Program

System that recognizes the calculation, report and management of GHG in projects and organizations of the public and private sector.

Type of MRV:
MRV System

Energy Project Savings Certification (CAPE)

This program seeks to facilitate the reporting of energy results and GHG mitigation results obtained after the implementation of an energy project whose objective is to reduce energy consumption. The certification is designed for companies, institutions and organizations.

Type of MRV:
Emissions

Reciclo Orgánicos Program

MRV Protocol for Composting, Anaerobic Digestion and Landfill Gas Capture of the Reciclo Orgánicos Program

Type of MRV:
Mitigation actions



2. RECICLO ORGÁNICOS PROGRAM AND MRV PROTOCOLS DEVELOPED

1

MRV in Chile

2

Reciclo Orgánico's
MRV

3

Blockchain
applications

Reciclo Orgánicos Program

- This Program was promoted by the of the Environment of Chile and the Ministry of Environment and Climate Change of Canada.
- The Program considered an investment of 7 million Canadian dollars over a period of 5 years (March 2017 – March 2022)
- It is focused on accelerating actions that help Chile achieve its NDC goals for the waste sector.
- Website:
www.reciclorganicos.com



Reciclo Orgánicos - Waste Sector MRV Protocols

**Landfill Gas
Capture and
Destruction
Protocol**

**Organic
Composting
Protocol**

**Anaerobic
Digestion of
Organic
Residues
Protocol**

Reciclo orgánicos – Waste Sector MRV Protocols

**Landfill Gas
Capture and
Destruction
Protocol**

**Organic
Composting
Protocol**

**Anaerobic
Digestion of
Organic
Residues
Protocol**

Overview of GHG Methodologies Anaerobic Digestion

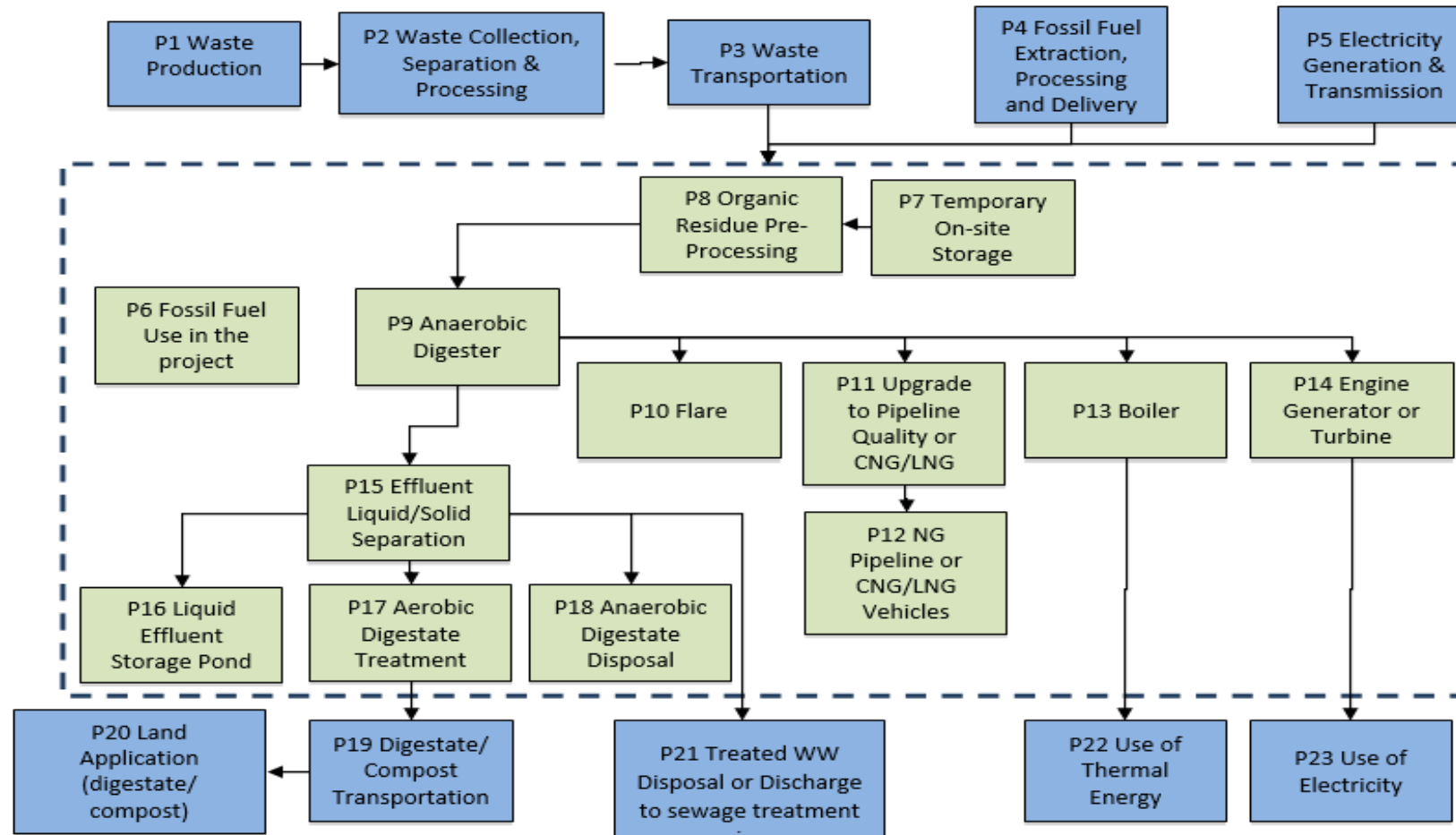
Anaerobic Digestion of Organic Residues Protocol

The scope of this protocol includes the following activities:

- Diversion of eligible organic residue streams to an Anaerobic Digester from the following types of facilities:
 - Landfills.
 - Other waste disposal sites.
- In the case of manure diversion, the eligible facilities are uncontrolled anaerobic management systems including:
 - Anaerobic treatment system with a retention time greater than one month.
 - Anaerobic lagoons with at least 1 (m) of depth.

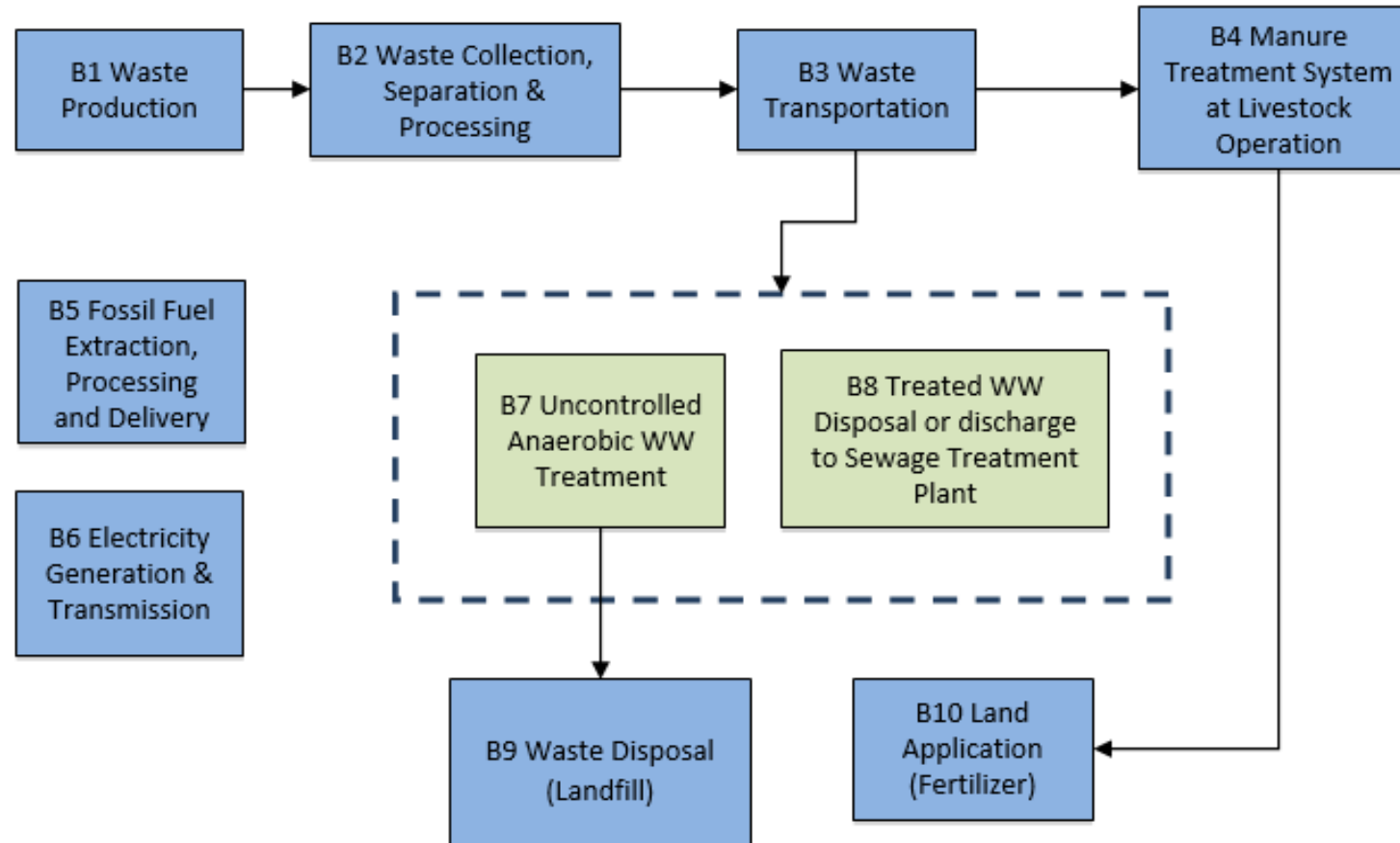
Overview of GHG Methodologies Anaerobic Digestion

■ SSR Diagram - Project



Overview of GHG Methodologies Anaerobic Digestion

■ SSR Diagram - Baseline



Overview of GHG Methodologies Anaerobic Digestion

Anaerobic Digestion of Organic Residues Protocol

The methane capture and control system shall be monitored with measurement equipment that directly meters:

- The flow of biogas delivered to each destruction device, measured continuously and recorded every 15 minutes or totalized and recorded at least daily, adjusted for standard temperature and pressure.
- The fraction of methane in the biogas, measured no less than once for every three-month period (i.e. a 12-month reporting period should contain no less than 4 methane concentration measurements).

Overview of GHG Methodologies Anaerobic Digestion

■ Eligible Destruction Devices

Biogas Destruction Device	Biogas Destruction Efficiency (BDE _{DD})
Open Flare	0.96
Enclosed Flare	0.995
Lean-burn Internal Combustion Engine	0.936
Rich-burn Internal Combustion Engine	0.995
Boiler	0.98
Microturbine or large gas turbine	0.995
Upgrade and use of gas as CNG/LNG fuel	0.95
Upgrade and injection into natural gas transmission and distribution	0.98

3. BLOCKCHAIN APPLICATIONS

1

MRV in Chile

2

Reciclo Orgánico's
MRV

3

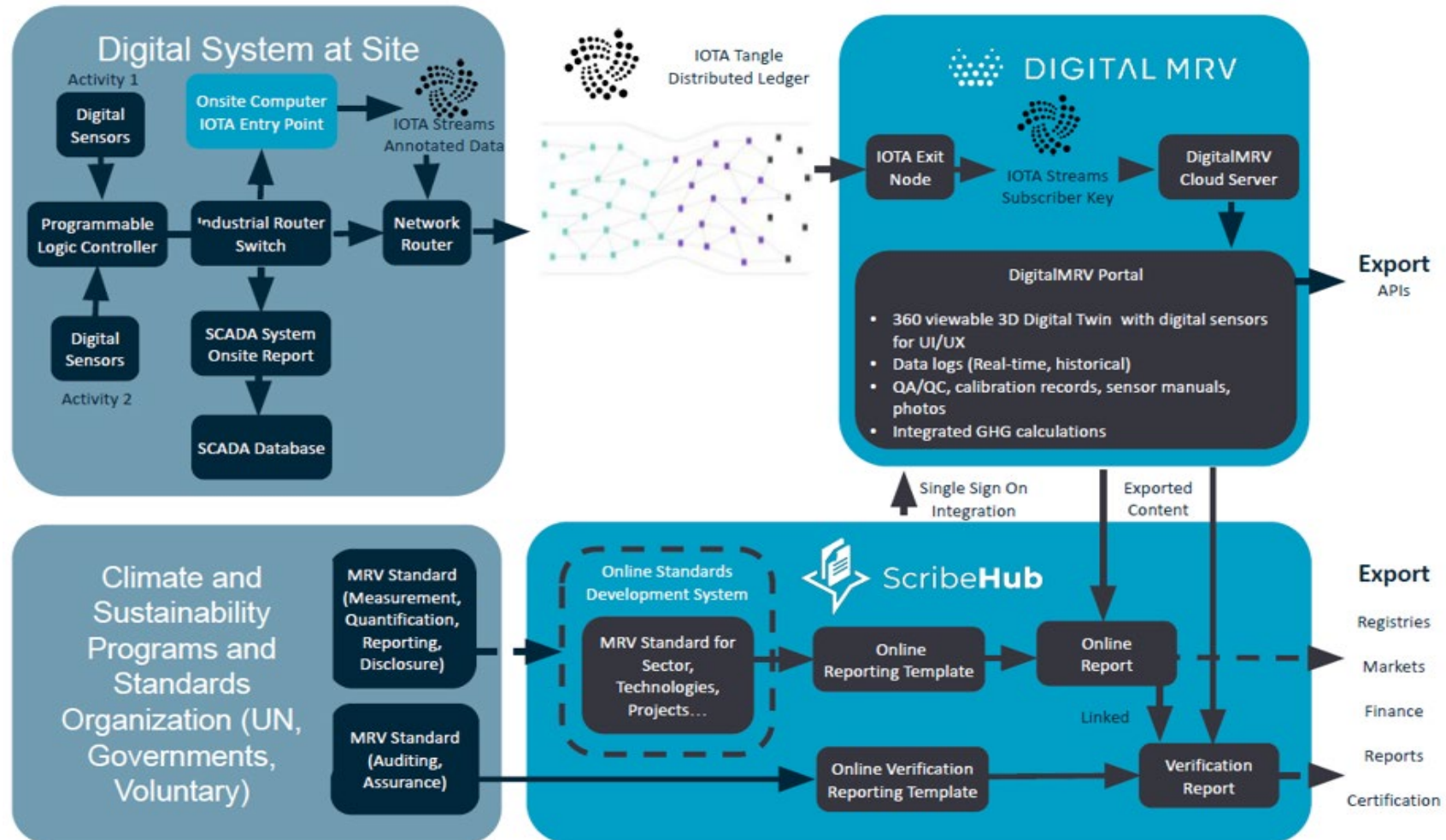
Blockchain
applications

Blockchain Applications

GHG QUANTIFICATION PROTOCOL ROAD TESTING

- A road test of two of the protocols (landfill gas and organic digestion) was undertaken at two different facilities in Chile.
- In addition to road-testing the GHG quantification protocols, the opportunity was also taken to demonstrate the development and implementation of the DigitalMRV system.

Blockchain Applications



Blockchain Applications



Overview of Copiulemu Landfill DigitalMRV System: <https://digitalmrv.io/overview>

Blockchain Applications

 DIGITAL MRV



Bio Energia Molina 

Bio Energia Molina

 Dashboard

 Analytics

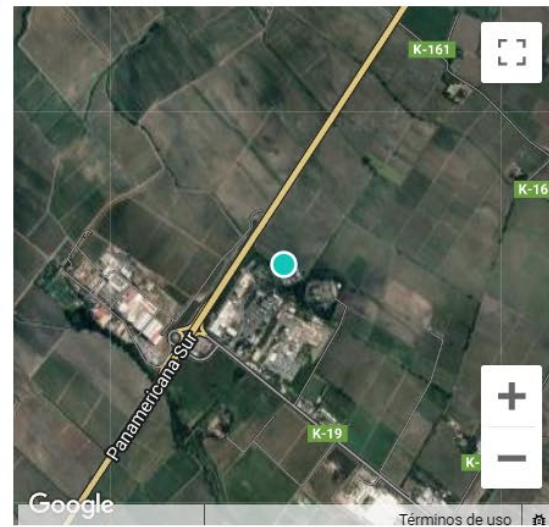
 Data Sources

 Activity

 Documentation

 Solution Architecture

 Users



Project type
CHP Plant






Methodology
Anaerobic Digestion Process

Project developer
Bio E

Project ID
BEM


Recent activity

[View all](#)

-  Ilenia Donoso logged in 4 minutes
-  idg@implementasur.cl logged in 4 minutes
-  Andrew Brough logged in about 1 month
-  Mathew Yarger logged in about 2 months
-  Tom Baumann logged in 2 months

 **0 t CO2e**
GHG emission reductions last 30 day

 **23,53 t CO2e**
Annual GHG emission reductions

 **73,25 %**
Data confidence score

Blockchain Applications

Bio Energia Molina

Analytics

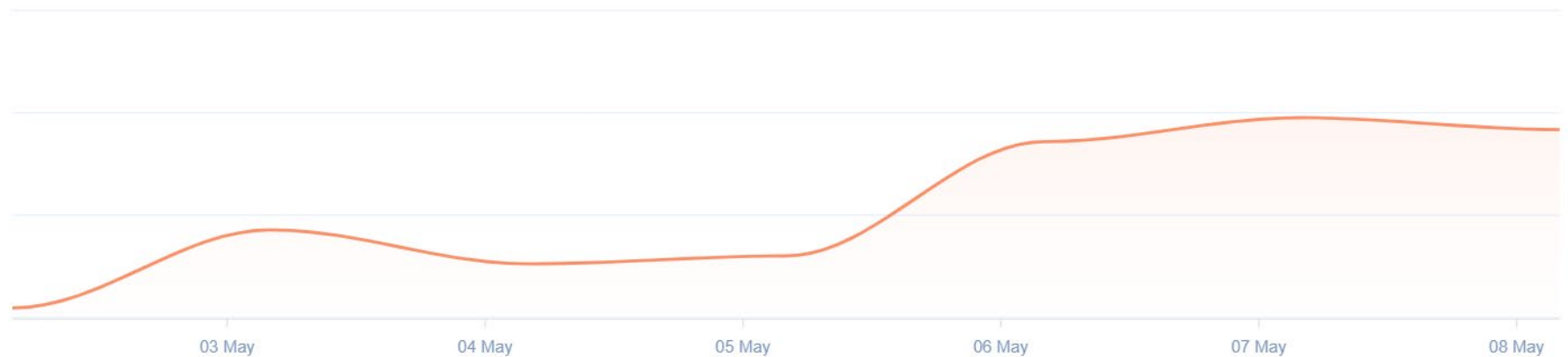
Last week

Export formulae

Settings

Total Project GHG emissions

Average: **59,65** t CO₂e Cumulative: **417,52** t CO₂e



Methane emissions from solid waste disposal sites

Average: **0,01** t CO₂e Cumulative: **0,07** t CO₂e



Dashboard

Analytics

Data Sources

Activity

Documentation

Solution Architecture

Users

Blockchain Applications

 DIGITAL MRV



ID

Bio Energia Molina 

Site plan

Virtual Tour



 Dashboard

 Analytics

 Data Sources

 Activity

 Documentation

 Solution Architecture

 Users

Options to Enhance the Use of GHG Methodologies

- A framework document, providing all policy decision surrounding the use of the GHG methodologies could be developed.
- The framework would provide clarity for the potential users on the GHG quantification for their projects and the creation of GHG emission reduction units.

Potential Next Steps

1. Development of a GHG Framework
2. Development of additional GHG Quantification Protocols for other high priority sectors identified in Chile's NDC. Developing GHG Quantification Protocols could improve the accuracy of the National Inventory Report
3. Ongoing monitoring and quantification of GHG emission reductions at the two existing facilities and potential to increase capacity building related to MRV for greenhouse gas reporting
4. The potential to deploy the DigitalMRV System at other facilities that are eligible to use the quantification approaches defined in the three GHG Quantification Protocols or other developed GHG Quantification Protocols

Potential Next Steps

5. Allow for trading of the emission reductions quantified at these various facilities, as high-integrity internationally transferred mitigation outcomes (ITMOs), under Article 6 of the Paris Agreement, supporting global mitigation objectives or to use these emission reductions to meet the Chilean obligations under their NDC.
6. The possibility to increase data confidence (QA/QC) and transparency when reporting:
 - GHG emissions and GHG emission reductions to the NDC Registry
 - GHG emissions for the National Inventory

I recycle organics, and you?...



**RECICLO
ORGÁNICOS**

Chile y Canadá contra el Cambio Climático

Thank You!



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Follow us on our networks

<https://www.reciclorganicoslac.org/>



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Director – ImplementaSur

Best Practices for Biogas Project Verification

Zach Eyler

Vice President

Ruby Canyon Environmental, Inc.



About Ruby Canyon Environmental



- Founded in 2005 and acquired by TÜV SÜD Americas in December 2022
- Provides impartial, 3rd party assurance to clients for GHG emissions reporting and GHG reduction projects (carbon offsets)
- Completed over 1,500 assurance engagements worldwide since 2009
- Experience in numerous sectors and project types including a focus on methane capture (coalmine, landfill, livestock, wastewater)
- Work in both compliance and voluntary programs
 - Compliance: California, Oregon, Washington, California LCFS
 - Voluntary: American Carbon Registry, Climate Action Reserve, Verra VCS, The Climate Registry, CDP, Gold Standard

Verification Overview

The Basics



- Provides assurance on methods used to quantify emission reductions and adherence to program rules.
- Serves as a process to improve MRV for biogas projects.
- Verification frequency varies by program, but an initial verification early in the project's lifecycle is recommended.
- A physical site visit to the project is often required for the initial verification but can vary on future verifications.
- While it can be seen as a partnership, verification is not consulting – it is a third-party engagement provided by an impartial verification body (VB).

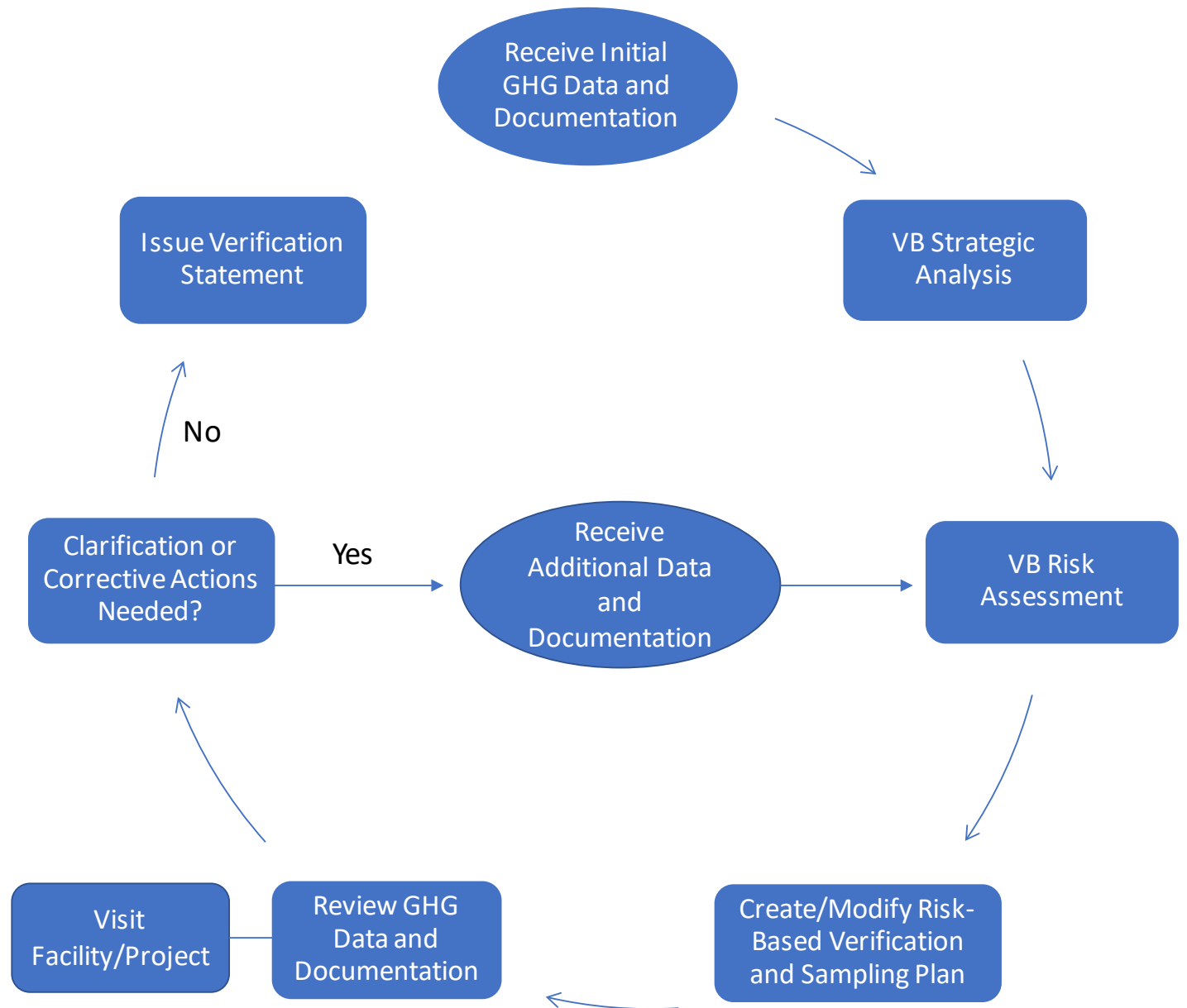
Verification Overview

Criteria and Standards



- Verification is conducted to specific standards
 - 14064-3:2019 Greenhouse Gases – Part 3: Specification with Guidance for the Verification and Validation of Greenhouse Gas Statements
 - Under a carbon credit program standard such as American Carbon Registry, Climate Action Reserve, Verra VCS, Gold Standard, CDM
- Verification is conducted to set criteria
 - Materiality: The threshold used to identify information/data that, if omitted or misstated, would significantly misrepresent GHG emissions. +/-5% is common amongst all programs.
 - Level of assurance: The degree of confidence in the data reported. Levels of assurance typically used are reasonable and limited, with all carbon credit programs requiring reasonable.
- All standards and criteria should be agreed upon before beginning verification activities.

Verification Process



Verification Process

Step-by-Step



Verification Activity	Description
Receive initial GHG data and documentation	The project submits GHG data and documentation to the verification body. This could include information on the baseline emissions scenario, measured data, equipment information, or QA/QC documentation.
Verification body strategic analysis	The verification body conducts an analysis of the project regarding the criteria, scope, and complexity of the verification. The verification body considers the project organization, management, and communication structure. The strategic analysis helps to inform the more detailed risk assessment.
Verification body risk assessment	The verification body identifies areas related to GHG emissions or other requirements of the applicable program that pose risk to GHG emissions. The areas are reviewed for each type of risk (inherent, control, detection) and a discussion of why the risk exists is completed. All areas of risk must be addressed to complete the verification.
Create/modify risk-based verification plan and evidence gathering plan	A verification plan and a evidence gathering plan are developed based on the risk assessment and strategic analysis. The verification plan is standard across projects, but the evidence gathering plan will vary from project-to-project.
Review GHG data and documentation	The verification body reviews all provided GHG data and documentation and documents this review.
Visit facility/project	If required, the verification body will visit the project or facility to review GHG sources, measurement equipment, and data-recording equipment; and interview personnel.
Findings - clarifications or corrective actions	The verification body will provide findings to the project as a result of its review. Depending on the nature of the findings (material versus non-material), some errors will need to be corrected to complete the verification while others could potentially be ignored.
Findings - receive additional data and documentation (if needed)	The project or facility will provide the verification body data and documentation to address the findings.
Risk assessment revision and evidence gathering plan modification (if needed)	Based on the new data and documentation, the verification body will review the risk assessment and modify the evidence gathering plan. This additional review could lead to additional findings.
Issue verification opinion	Once all findings are closed, the verification body will complete the process and issue a verification opinion. The opinion will note the criteria and scope of the verification, as well as the confirmed emissions value.

Site Visit

Example Topics



Source: BioCycle

- Review baseline scenario
 - Livestock: What was manure operations/management before digester operation?
 - Landfill: Was gas managed at all or destroyed prior to installation of the landfill gas collection system ?
- Review data management
 - How is data recorded?
 - Review information control systems
 - Trace data from source to final calculations
- Review monitoring equipment QA/QC
 - Calibrations
 - Ongoing checks and procedures
- Tour the project
 - Inspection of GHG Sources, Sinks, Reservoirs (SSRs)
 - Fossil fuel or electricity consumption
 - See monitoring equipment (SNs, location)
 - See data collection equipment

Common Issues

Typical Problems and Errors



- Use of wrong emission factors in calculations
- Unit conversion errors in calculations
- Too many calculation spreadsheets making it difficult to trace data
 - Example: “Black box” calculator tool
- Spreadsheet functionality
- Not following manufacturer specifications for QA-QC
- Not having an internal QA-QC program for calculations
- Lack of source documentation
 - No animal counts for livestock population

Sample Findings Document

Issues Log version:	2.0				
Project Name:	Cows Biogas Project				
Project ID:	ABC12				
Client	Dairy Farm				
Corrective Action Request, Non-Material Finding, Additional Documentation Request, or Clarification Request ID#	Finding	Section of Methodology	Client response	RCE response	Open or Closed
CAR 1	Incorrect data substitution is utilized for the engine flow meter from April 2-8, 2020.	Appendix D	Revised calculation provided.	Data substitution is now correct.	Closed
NM 1	Data typos found in December 2020 Herd Data: -Flush Open Lots 0-6: Data entered 1596 -Flush Open Lots 0-9: Data entered 4	5.1	Typos corrected. Flush Open Lots 0-6: Updated Data Entered 156 Flush Open Lots 0-9: Updated Data Entered 204	The typos have been corrected.	Closed
NM 2	The annual baseline lagoon cleanout in September is not reflected in the calculation tool.	5.1	Corrected this data inaccuracy.	The clean out has been added.	Closed
ADR 1	Please provide a comparison of electricity generated vs. consumed to confirm Project emissions are zero.	5.4	Electricity invoices have been provided showing that exported electricity exceeds electricity consumed onsite	Invoices provided and confirmed electricity generated is greater than what is consumed.	Closed
CR 1	For the venting event, please clarify why for the calculation of the max biogas storage, 395 ft is used for width when it appears to be 345 ft. Also please clarify the source of the 15 ft used for the depth of the lagoon.	5.2	The typo has been revised to be consistent with the width of the pond. The height is conservatively calculated based on estimates provided by the design engineers, which has been forwarded as an email attachment.	Confirmed.	Closed

Keys to Verification Success

Follow the Principles



Revisiting three of the original MRV principles...

- (1) Completeness: Projects should have access and be able to provide documentation and data for ALL relevant aspects of the project and program to the verification body
 - Take away: Implement a measurement plan to ensure that data and documentation is recorded, saved and organized.
- (2) Transparency: Verification body needs to be able to trace all information sources, data, and calculations
 - Take away: Design the project calculations with transparent data and equations as well as traceable back to the original data source.
- (3) Accuracy: Emission reduction calculations are correct within a defined materiality threshold and must be corrected if errors are detected.
 - Take away: Develop an internal QA-QC system for calculations and data.

Keys to Verification Success

Communication is Key



- Clearly define the expectations and responsibilities for all parties when initiating the verification activities
- Present documents and data in an organized manner
- Provide responses to verification body questions and requests in a timely manner
- View the verification process as a means to improve a project's MRV system
- Use an accredited Verification Body to ensure a high-quality review

Thank you!



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Key Takeaways



- GMI's Policy Maker's Handbook for Measurement, Reporting, and Verification in the Biogas Sector offers guidance for MRV in the biogas sectors. **Download on** globalmethane.org/resources.
- The anaerobic digestion MRV protocol of the Reciclo Orgánicos Program is an excellent case study of MRV for biogas projects
- The keys to verification success include following the original MRV principles and clearly communicating the verification process

Part 1 and 2 of GMI's MRV Webinar Series

1

Measurement, reporting, and verification (MRV) involves collecting and tracking greenhouse gas emissions data, reporting data in a standardized format, and verifying data for accuracy and completeness.

2

MRV for biogas projects is critical for building national inventories to meet transparency requirements of the Paris Agreement.

3

Measurement is the most important component of MRV. There is a growing wave of **methane-detecting satellites** and **data platforms**, such as Waste Methane Assessment Platform and Carbon Mapper's data portal.


4

[GMI's Policy Maker's Handbook for Measurement, Reporting, and Verification in the Biogas Sector](#) offers guidance for MRV in the biogas sectors.

The Role and Importance of Measurement, Reporting, and Verification (MRV) for Biogas Projects
Part 1 in the Global Methane Initiative's (GMI) MRV Webinar Series

[Click here to watch](#)

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[Click here to watch](#)

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Q&A Session



Enter your questions in the Q&A box!

Thank You!



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The slide deck and webinar recording will be made available on GMI's website.