# 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***

Global Methane Initiative

8 September 2022
11:00 AM – 12:00 PM EDT (UTC -4)

# 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)

# Speakers

**Nick Elger**
Agriculture and Waste Lead
U.S. Environmental Protection Agency (EPA)
GMI Biogas Subcommittee Co-Chair

**Neelam Singh**
Senior Associate
World Resources Institute

**Lisa Hanle**
Independent Consultant
Former Team Lead at
United Nations Framework
Convention on Climate Change (UNFCCC)

# Agenda

Global Methane Initiative

Global Methane Initiative and Biogas Overview – Nick Elger

Basics of MRV – Neelam Singh

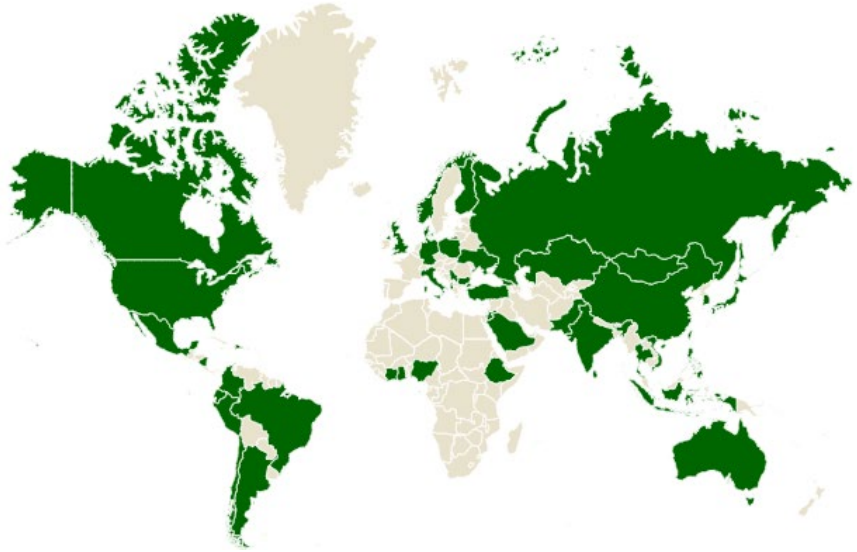
Importance of Biogas MRV for National Inventories and the Paris Climate Agreement – Lisa Hanle

Global Methane Initiative's MRV Tools and Resources– Nick Elger

Q&A

# Global Methane Initiative Background

- **GMI is an international public-private partnership** launched in 2004.
- As a founding member, the **United States** provides in-kind support through the **U.S. Environmental Protection Agency**
  - **Provides technical support** to deploy methane-to-energy projects around the world
  - **Develops and maintains information resource** for Partner Countries, Project Network members, and other stakeholders
- **GMI focuses on three major sectors: Biogas, oil and gas, and coal.**
- Countries and organizations are **encouraged to join** the Initiative.

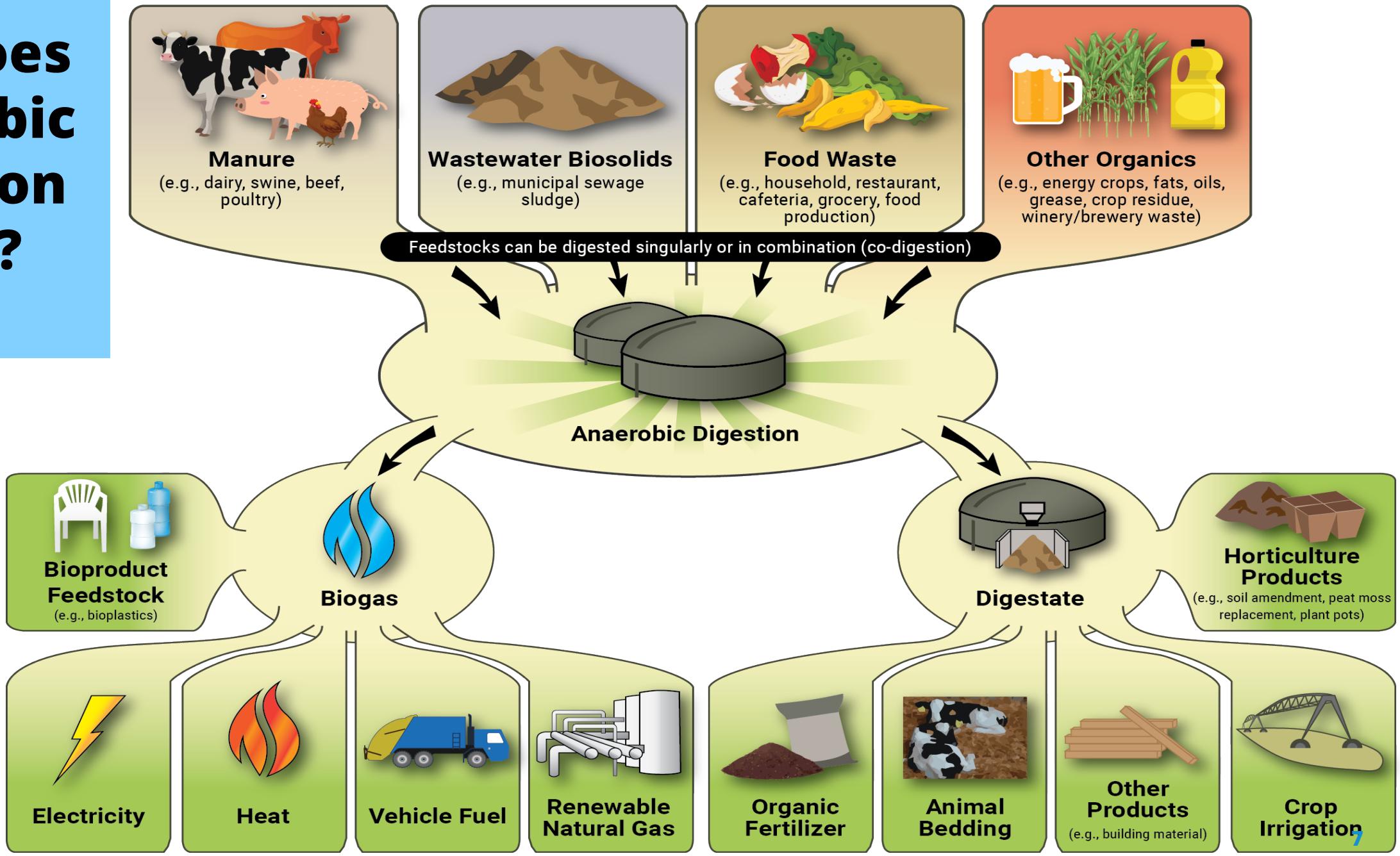


**46 GMI Partner Countries** represent approximately **75% of the world's man-made methane emissions**

# Biogas Sector

- The biogas sector accounts for approximately **one-fifth of global anthropogenic methane emissions**
- Anaerobic digestion projects can help **capture and use the methane** and provide benefits including, climate change mitigation, energy generation, and public health benefits

# How does anaerobic digestion work?



# Benefits of Biogas Projects

**Biogas Systems are a tool to manage organic wastes sustainably**

## Environmental

- Methane emission reduction and improved local air, water, and soil quality

## Energy

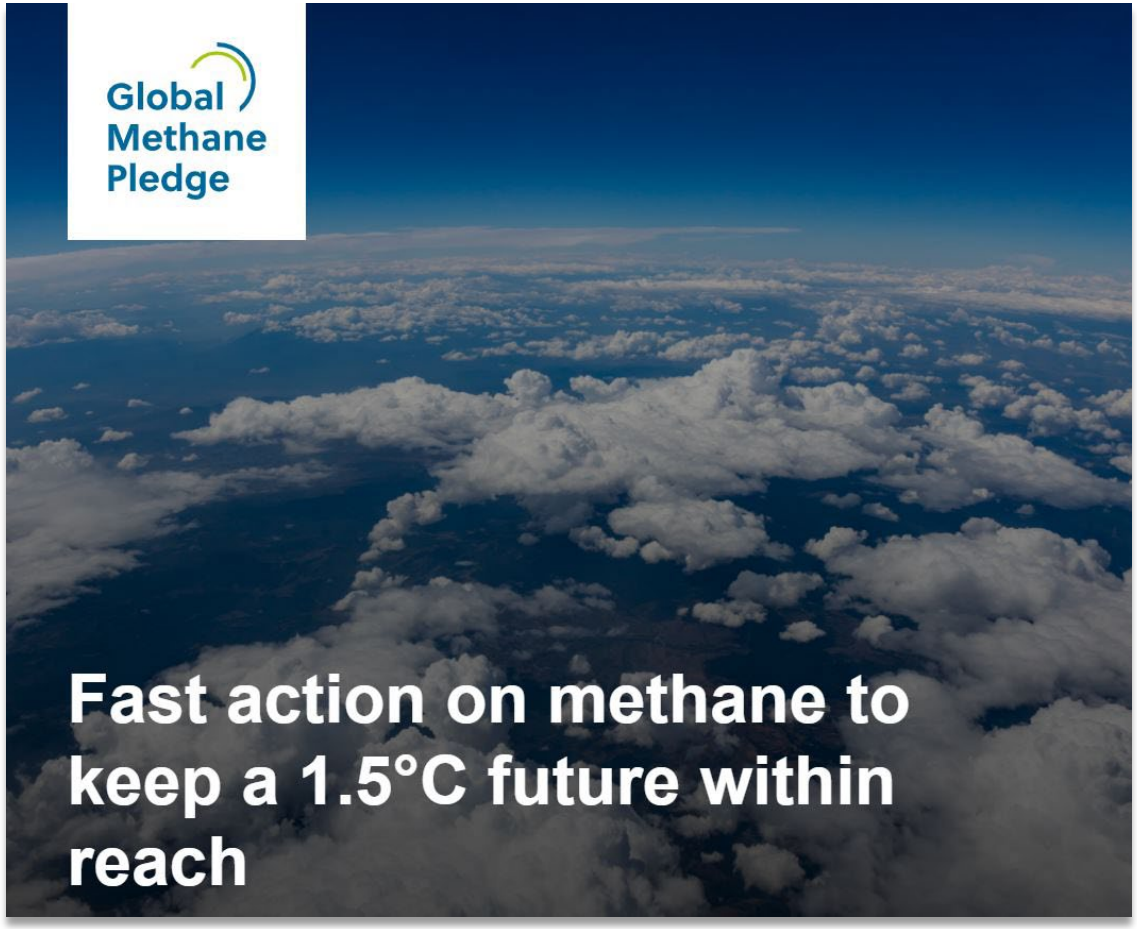
- Energy independence and displacement of fossil fuels

## Economic

- Diversified revenue through sale of energy and co-products; local economic impacts

# Achieving the Global Methane Pledge

- **The Global Methane Pledge (GMP)** is an agreement by over 120 countries to collectively cut global methane emissions by at least 30 percent from 2020 levels by 2030
- **Achieving the GMP** will require substantial mitigation action across all methane-emitting sectors
- **MRV of biogas projects** provides data to track and demonstrate progress toward achieving the GMP
- **GMI is a resource hub** for countries seeking assistance in developing robust MRV frameworks that capture emissions and emissions reductions from biogas projects



# The Basics of MRV

**Neelam Singh**
Senior Associate
World Resources Institute

# Transparency and MRV

- **Transparency**: general concept of being transparent with regards to climate change efforts (domestic and international)
- **MRV**: generally refers to the specific activities undertaken in order to be transparent (domestic and international)

# Enhanced Transparency Framework

**The purpose of the enhanced transparency framework for action and support:**

- to provide a clear understanding of climate change action including clarity and tracking of progress towards achieving Parties' individual nationally determined contributions (NDCs) and adaptation actions
- to provide clarity on support provided and received by relevant individual Parties in the context of climate change and to provide a full overview of aggregate financial support provided

**Considerations:**

- **Improvement over time –** all countries are encouraged to improve their fulfilment of the objectives overtime
- **Flexibility –** for those developing country Parties that need it in light of the capabilities is reflected in the modalities, procedures and guidelines
- **Discretion** – for example, the first Biennial Transparency Reports (BTR) are due December 2024, but the least developed country Parties and small island developing States may submit the information at their discretion
- **Support** – Capacity Building Initiative for Transparency was established to support developing countries improve their institutional and technical capacity

# What is MRV

- Measurement: Measurement & estimation & monitoring – entails collecting activity data, information, e.g., quantifying greenhouse gas (GHG) emissions of a country
- Reporting: Compiling, aggregating and communicating information in a particular/standardized format, e.g., national GHG inventories
- Verification: independent assessment, review and analysis of reported information to establish completeness, accuracy

MRV refers to sum total of methods, rules and procedures, administrative agency, reporting entities, related institutions, etc. necessary to perform and facilitate MRV

# Manage what you measure

- Understand emissions profile & track emissions over time – of nation, business or any other entity
- Understand the impact of mitigation actions
- Track progress towards NDC goals
- Meet any international obligations e.g., communication of progress in terms of emissions and impacts internationally in national communications, BURs etc.
- Enable access to finance through consistent communication of progress
- Fulfill any future requirements under the enhanced transparency framework for action established under the Paris Agreement

# Purpose of MRV

**International level**

- Meet international reporting obligations under UNFCCC; Build trust; Track global emissions and emissions reductions

**National level**

- Provide a picture of national emissions; Allow for identification of which sectors contribute the most; Allow for identification of trends within sectors and sub-sectors

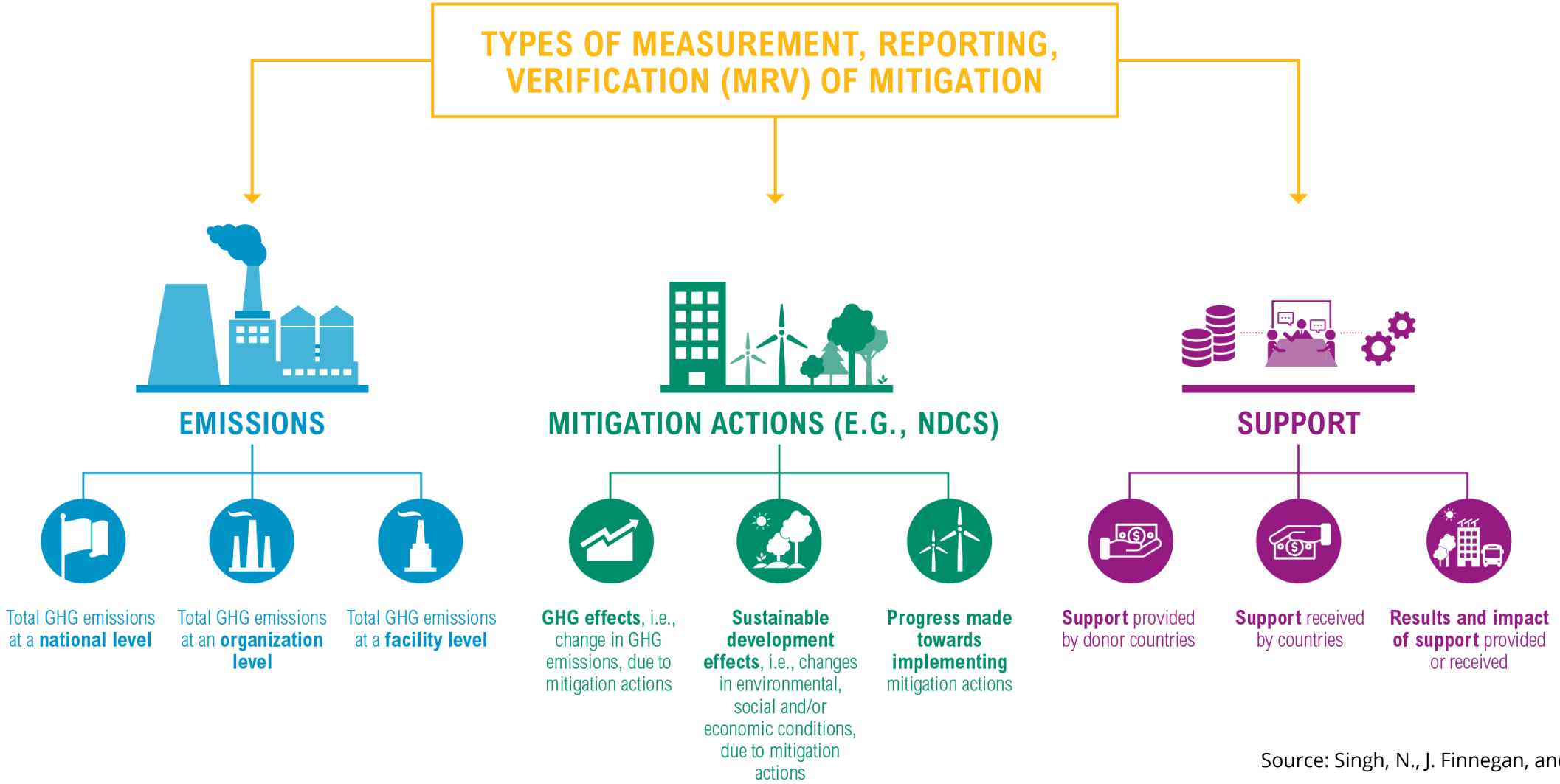
**Organizational level (e.g. corporate level) & Facility level**

- Facilitate policymaking by analyzing emissions data at different resolutions; Improve GHG data quality to support policy objectives; Provide information to stakeholders; Inform national GHG inventories; Help reporting entities assess their climate risks and opportunities; Support policies and regulations, such as emissions trading schemes, which require detailed source-level data; Improve overall GHG data quality and inform national GHG inventories

**Project level**

- Assess impacts of mitigation projects; Track progress toward mitigation targets; Meet stakeholder demands for public disclosure of information

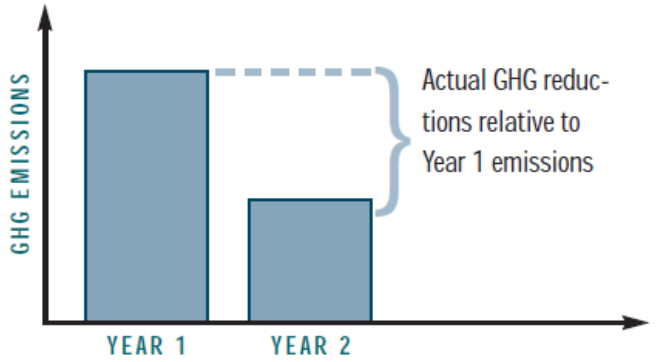
# Types of MRV



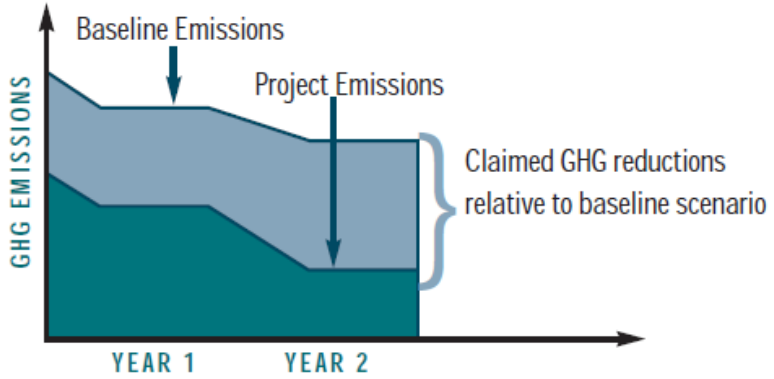

Source: Singh, N., J. Finnegan, and K. Levin. 2016

# Inventory vs Mitigation Action accounting

## Inventory accounting: Year-on-year emissions tracking




## Mitigation action accounting: Estimating the change in GHG emissions from an intervention




Source: WRI 2014

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# Purpose of MRV

**TYPES OF MEASUREMENT, REPORTING, VERIFICATION (MRV) OF MITIGATION**

**EMISSIONS**

13.7(a) National inventory reports

**MITIGATION ACTIONS (E.G., NDCS)**

13.7(b) Information necessary to track progress made in implementing and achieving NDC under Article 4

**SUPPORT**

13.10 Information on support needed and received

# Thank You!

**Neelam Singh**
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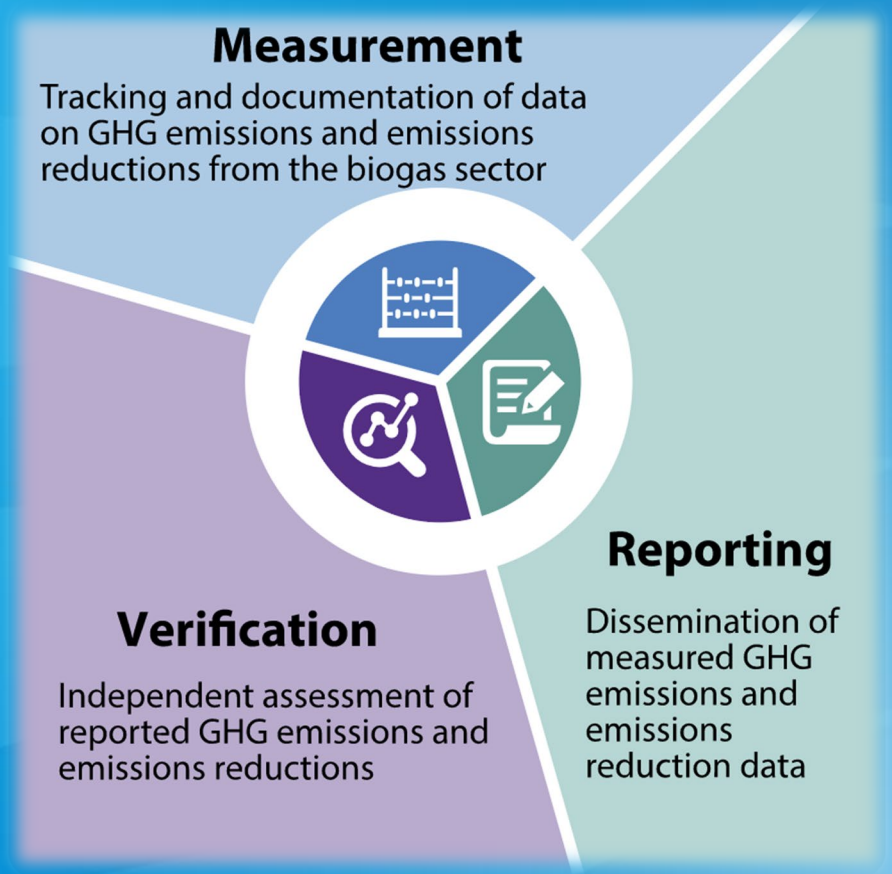
# Importance of Biogas MRV for National Inventories and the Enhanced Transparency Framework

**Lisa Hanle**
Independent Consultant
Former Team Lead at UNFCCC

# Overview




- MRV of biogas: importance of transparent climate data and information
- International context – evolution from MRV to transparency
- Highlighting the biogas sector under the Enhanced Transparency Framework
- MRV of biogas sector: making it happen
- Key messages

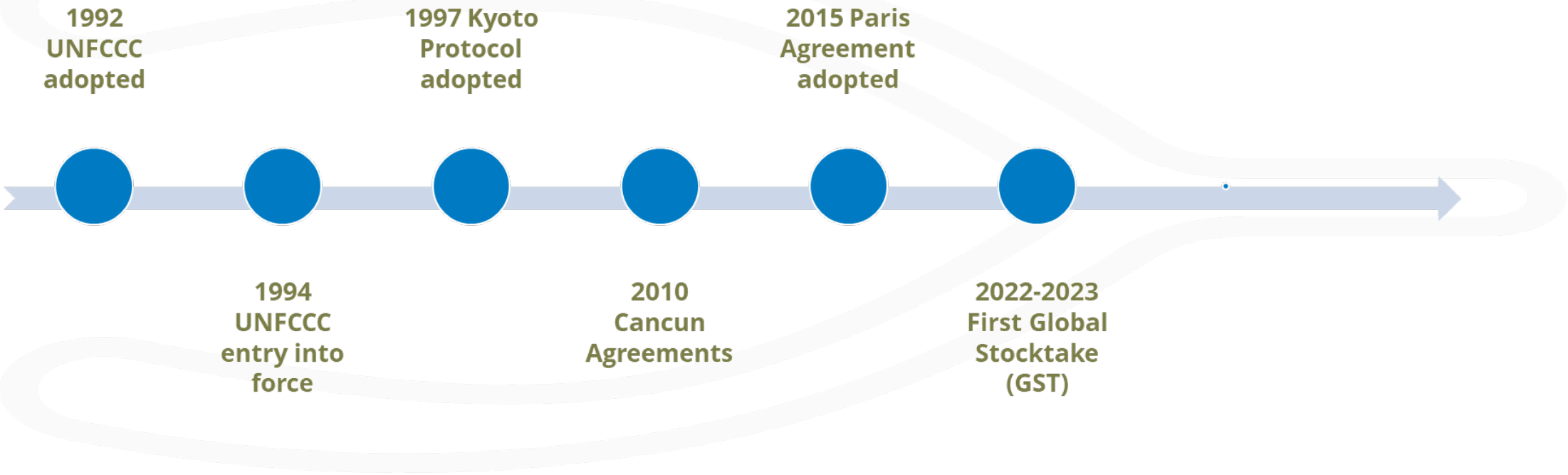
# Need for Transparent Climate Data and Information, including for the Biogas Sector

*Source: EPA*

- Generate information to inform domestic policy-making
- Align national and subnational calculation and reporting to demonstrate that emissions reductions seen on the ground are seen at the national level
- Instill confidence on your actions and progress;  builds trust
- Evidence-base to help attract support where it is most needed
- Document that support received is achieving real results
- Verifying reductions generates revenue in carbon markets and leverages funds through various instruments
- Why is it particularly important for the biogas sector
  - The biogas sector is a significant source of methane ($CH_4$) emissions
  - $CH_4$ is a potent GHG and reductions now have timely impacts
  - This sector can be more complex for measurement of emissions and reductions, so deserves special attention
  - Biogas can be recovered and used and serves as economic resource

# Evolution of MRV in the International Arena

**Developed countries:** National communications→ annual GHG inventories→ biennial reports




**Developing countries:** National communications→ biennial update reports

# Evolution of MRV in the International Arena

**Developed countries:** National communications→ annual GHG inventories→ biennial reports

1992 UNFCCC adopted

1994 UNFCCC entry into force

1997 Kyoto Protocol adopted

2010 Cancun Agreements

2015 Paris Agreement adopted

2022-2023 First Global Stocktake (GST)

**2024 First Biennial Transparency Reports (BTR) under PA due**

- Common framework
- Increased rigor
- Flexibility for developing countries who need it in light of capacity
- Importance of MRV for biogas and all sectors increased

2025 NDC communicated

2026 BTR #2 due

2027-2028 GST #2

**Developing countries:** National communications→ biennial update reports

# Building enhanced MRV systems towards the Enhanced Transparency Framework of the Paris Agreement

Develop policies and implement action to recover $CH_4$, track amount of $CH_4$ emitted and recovered, frequently assess progress

Identify national goals/targets (conditional/unconditional) Baselines, methods, indicators, needs

Reduce $CH_4$ emissions from solid waste disposal sites (SWDS) by X %, indicate support needed

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**GHG inventory:** national estimate of $CH_4$ from SWDS
**Track progress:** annual amount of $CH_4$ emitted/ recovered
BTR reviewed and findings published→ is country meeting requirements? Identify capacity building needs

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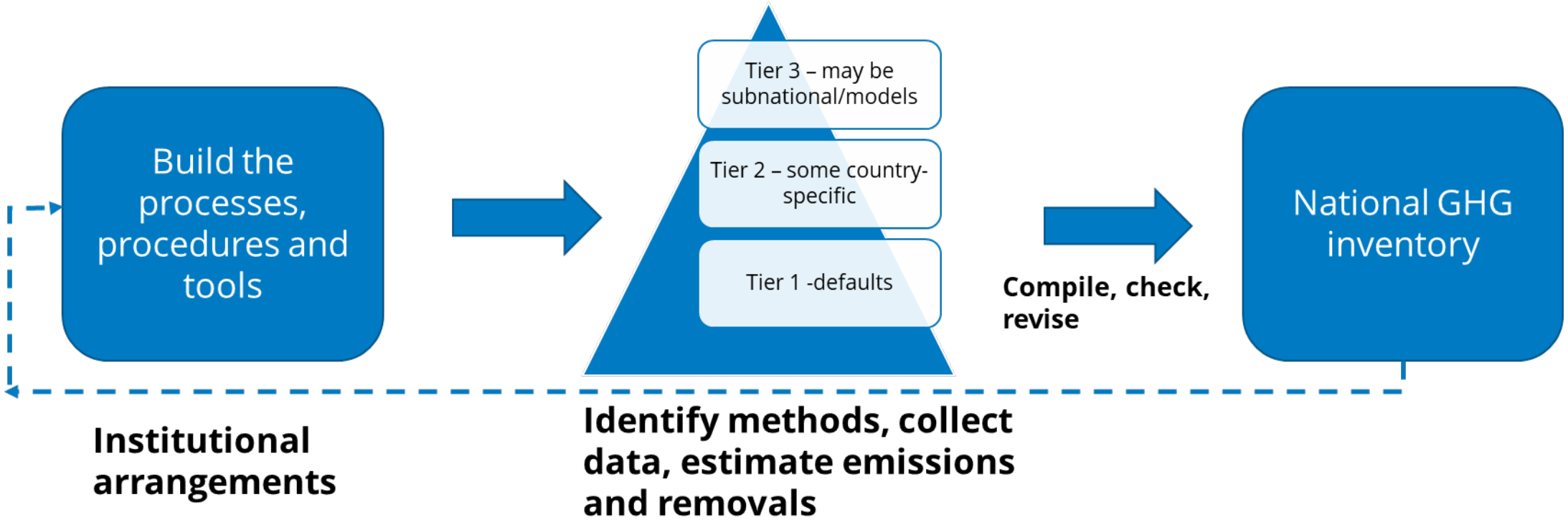
Reduce $CH_4$ emissions from solid waste disposal sites (SWDS) by X %, indicate support needed

$CH_4$, as short-lived climate pollutants (SLCP) with a higher GWP relative to carbon dioxide ($CO_2$), and with significant mitigation potential, is a critical part of this conversation

Every 5 years assess globally whether we are achieving goals

# Developing a National GHG Inventory : Simplification



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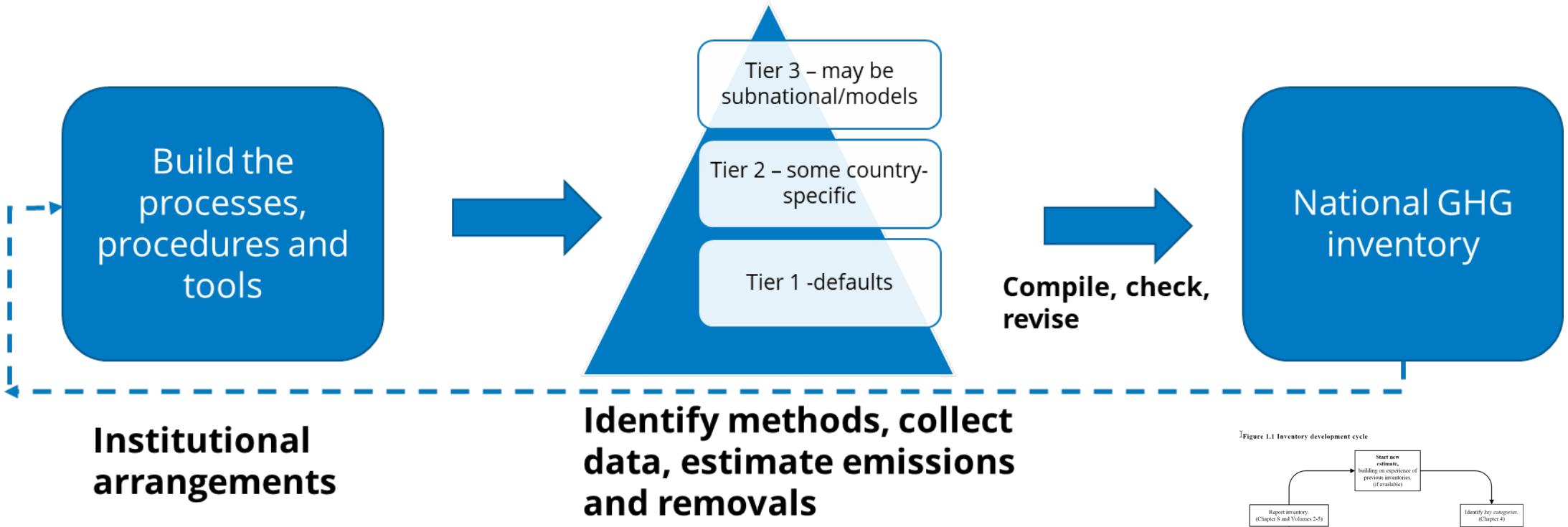
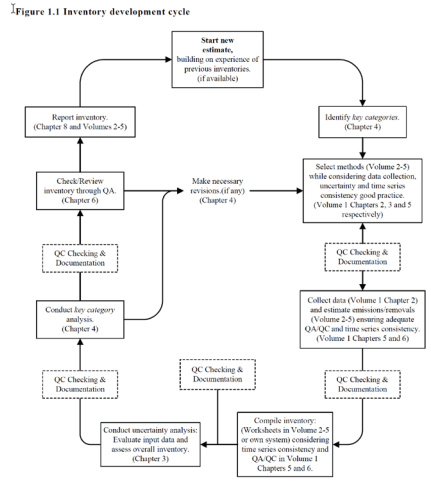



***Reality is messier and not so linear, and that is OK.***

***Want to learn more? Check out the [2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines, vol. 1, chapter 1] for an overview***

# Bringing it all together to make it happen

*"Looking at our national GHG inventory, emissions from wastewater are high and growing."*

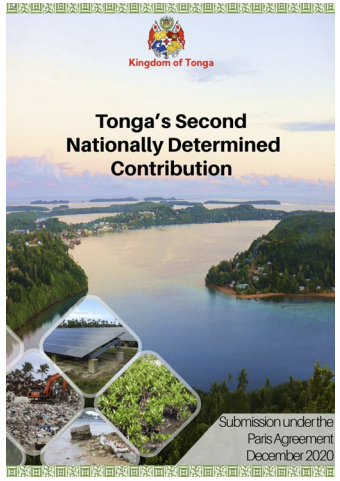
*"Valuable to include sector in NDC – reduce emissions cost effectively, attract support"*

*"But our national GHG Inventory is only tier 1?"*

*"Use the best information available to identify baseline,. Important to consider what will be used to track progress during NDC development. By including in our NDC, we intend on focusing policies to reduce these emissions, with support, and implement several projects…"*

*"Data from the projects can, over time, help improve our national inventory for wastewater (e.g., sludge and recovery)"*

*"Let's get all the right people together and make it happen! We need to better understand these activities, reduce $CH_4$ and improve our national GHG Inventory"*




***The case of Tonga, Second NDC:***

***What?*** *Non-emission target of expanding the formal waste collection system as prerequisite to identify a GHG emission target for the 2025 NDC.*

***Why?*** *Waste is only 0.3% of national emissions according to latest GHGI but want to improve completeness and transparency of data.*

***Goal?*** *Expansion of the formal waste collection system as a prerequisite to identify a GHG emission target for the 2025 NDC.*

# Making it happen

- Important to establish or refine regulation and institutional arrangements to facilitate action.
- National level estimates can give you a sense of the magnitude of a source, even when lower tiers used.
- Project MRV can help refine factors and acquire a better understanding; attract support
  - In the biogas sector, these projects can help improve not only emission factors, but activity data as well
  - For most categories in biogas sector, 2006 IPCC Guidelines allow recovery to be considered in higher-tiers only, so can support advancement to higher tiers on national level
- May not be able to immediately include in national GHG inventory, but possible over time, if data representative.
- Developing national GHG inventories takes time…

# Why is there a need to focus on MRV of biogas sector now?

- The biogas sector is a significant source of anthropogenic $CH_4$ emissions.
- It makes economic sense!  Capturing and selling biogas is a source of revenue.
- To generate and sell reductions (e.g. voluntary markets, Article 6) you need robust accounting of reductions.
- We are in the implementation phase of the Paris Agreement NOW
  - Countries should be tracking progress towards their goals, including in the biogas sector
  - Countries should be preparing their final GHG inventories under the Convention and shifting to the 2006 Guidelines, where needed, to prepare their first BTR under the Paris Agreement.
- Generating transparent, accurate, complete, consistent and comparable climate data and information is a foundation for evidence-based decision making at the national and international level.

# Thank You!

**Lisa Hanle**
Independent Consultant
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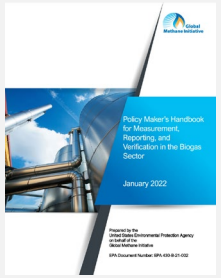
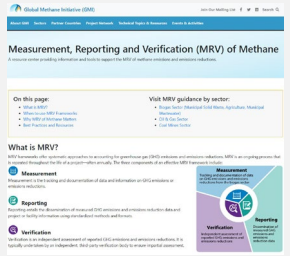
# Tools and Resources for MRV

**Nick Elger**
U.S. Environmental Protection Agency
GMI Biogas Subcommittee Co-Chair

# Overview




MRV Handbook for Biogas Sector




MRV Resource Center


Upcoming Global Methane, Climate and Clean Air Forum

# MRV Handbook for Biogas Sector

## Purpose

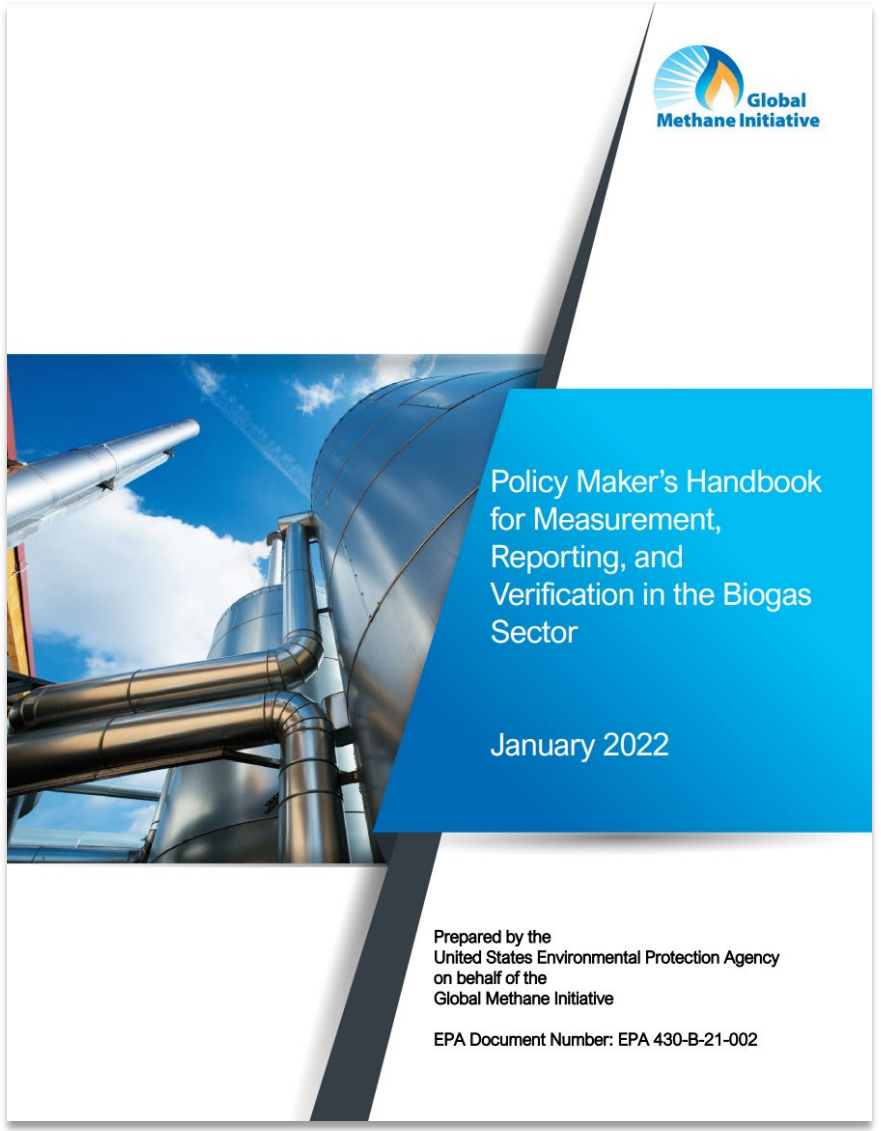
- **High-level resource** on guiding principles for conducting emissions MRV for the biogas sector
- **Support decision-makers** in incorporating project-level MRV into national-level frameworks and objectives

## Scope

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

## 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 for the MRV Handbook

1. Learn about the components of an effective MRV framework and the benefits of biogas MRV at the project-level

2. Explore the practical application of best practices through examples and case studies

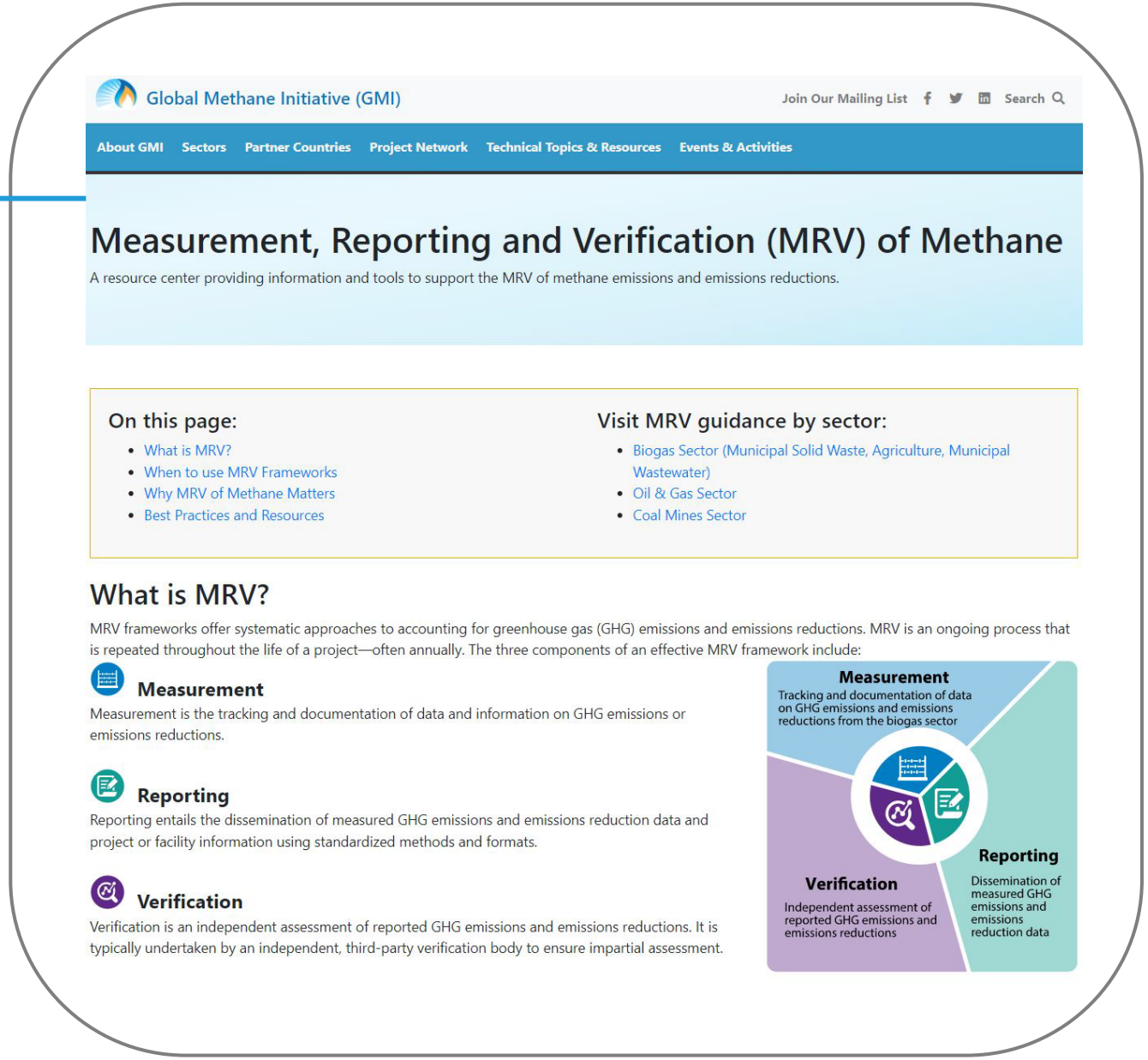
3. Learn how to use biogas project MRV data to develop national inventories and enhance mitigation targets in NDCs

4. Explore appendix for comprehensive list of tools and resources for biogas project MRV

# MRV Resource Center

**Go to:** globalmethane.org/mrv

- **Centralized location** of all GMI MRV resources
- **Multi-sector information** for Agriculture, Waste, Oil and Gas, and Coal Mines
- **Background information** on what MRV is, when to use MRV frameworks, why MRV of methane matters



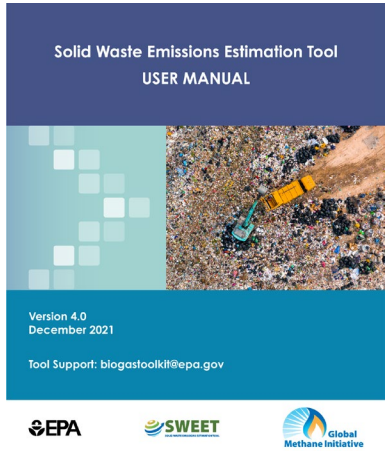
# MRV Resource Center

**Learn about Biogas Sector MRV**

- **Benefits of biogas project MRV** in developing national inventories and enhancing mitigation targets in NDCs
- **Best Practices** for biogas sector MRV
- **MRV tools and resources** for the biogas sector
- **Other MRV Resources** from WRI, UNFCCC, UNDP, etc.

# Tool Example: Solid Waste Emissions Estimation Tool (SWEET)

- **Excel-based tool** for quantifying pollutant emissions from sources across the waste sector
  - Project-, source-, or system-level emissions estimates
  - Methane, black carbon, particulate matter, and other pollutants
- **Increasing usage** among audience
  - Used in 50+ cities to date
  - Adopted by the International Solid Waste Association's Closing Dumpsites campaign
  - Incorporated into the United Nation's Habitat's Waste Wise Cities Tool
  - Used by World Health Organization as part of the Urban Health Initiative


"SWEET can be considered a policy planning tool that requires less data input than the usual life cycle assessment-based tools."
**World Health Organization**

# Global Methane, Climate, and Clean Air Forum

- **Premier global event** bringing together international stakeholders to discuss climate and air quality opportunities with a special focus on methane
- **Agriculture and Waste Sessions** to discuss challenges and opportunities to advance circular economy
- **Networking opportunities** with biogas and methane experts in the public and private sectors from around the world
- **Livestreamed and in-person**

**Register:** globalmethane.org/2022forum

# Key Takeaways

- **GMI & partners' tools and resources** enable decision-makers to establish effective MRV systems for biogas projects
- **GMI aims to create a network of MRV practitioners** to share best practices and lessons learned
- **Please stay tuned** for next webinar in the series, which will explore MRV best practices and case studies

# Thank You!

**Nick Elger**
GMI Biogas Subcommittee Co-Chair
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The slide deck and webinar recording will be made available on GMI's website.

# Q&A Session

Enter your questions in the Q&A box!