CLIMATE ACTION RESERVE

Public Kick-Off Meeting:
Chile Landfill Protocol

July 1, 2024

Introduction

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Housekeeping

- All attendees are in listen-only mode
- Please submit your questions in the Zoom question box and we'll try to answer them at the end, time permitting
- We will follow up via email to answer any questions not addressed during the meeting
- The slides and a recording of the presentation will be posted online on the Climate Action Reserve webpage

  Chile Landfill Protocol Development | Climate Action Reserve

AGENDA

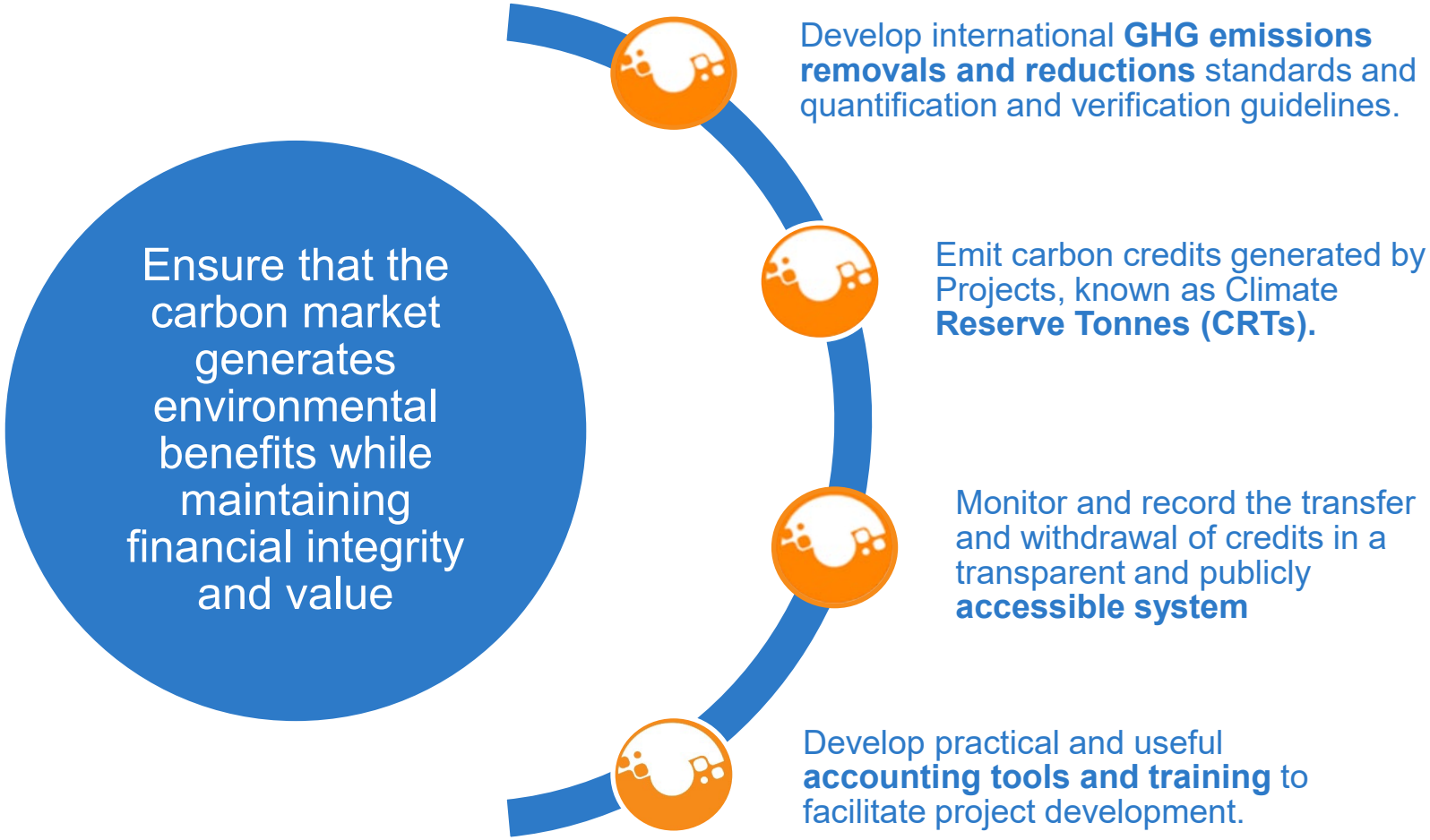
- Climate Action Reserve
- Background on the landfill sector in Chile
- Protocol development process/timeline
  - REMINDER:
    - Statements of Interest for the technical workgroup due on **July 16, 2026**
    - Stakeholder Engagement Forms available
- Key considerations for protocol development
  - Project definition
  - Project ownership
  - Additionality
  - Permanence
  - Quantification
  - Monitoring/reporting / verification
- Next steps

Climate Action Reserve

Mission: *to develop, promote and support innovative, credible market-based climate change solutions that benefit economies, ecosystems and society*

- ✓ **Develop high-quality, stakeholder-driven, standardized** carbon offset project protocols internationally
- ✓ **Registry of carbon credit projects and offset projects** for voluntary and compliance carbon markets. California and Washington (EEUU); Queretaro (Mexico); CORSIA.
- ✓ **High reputation for integrity and experience** in providing best-in-class registry services for offset markets

The Climate Action Reserve



Climate Action Reserve Projects

Project Type: Select | Status: Select | Country: Select | State: Select | Project ID: Select | Project Video: Select

Number of Projects

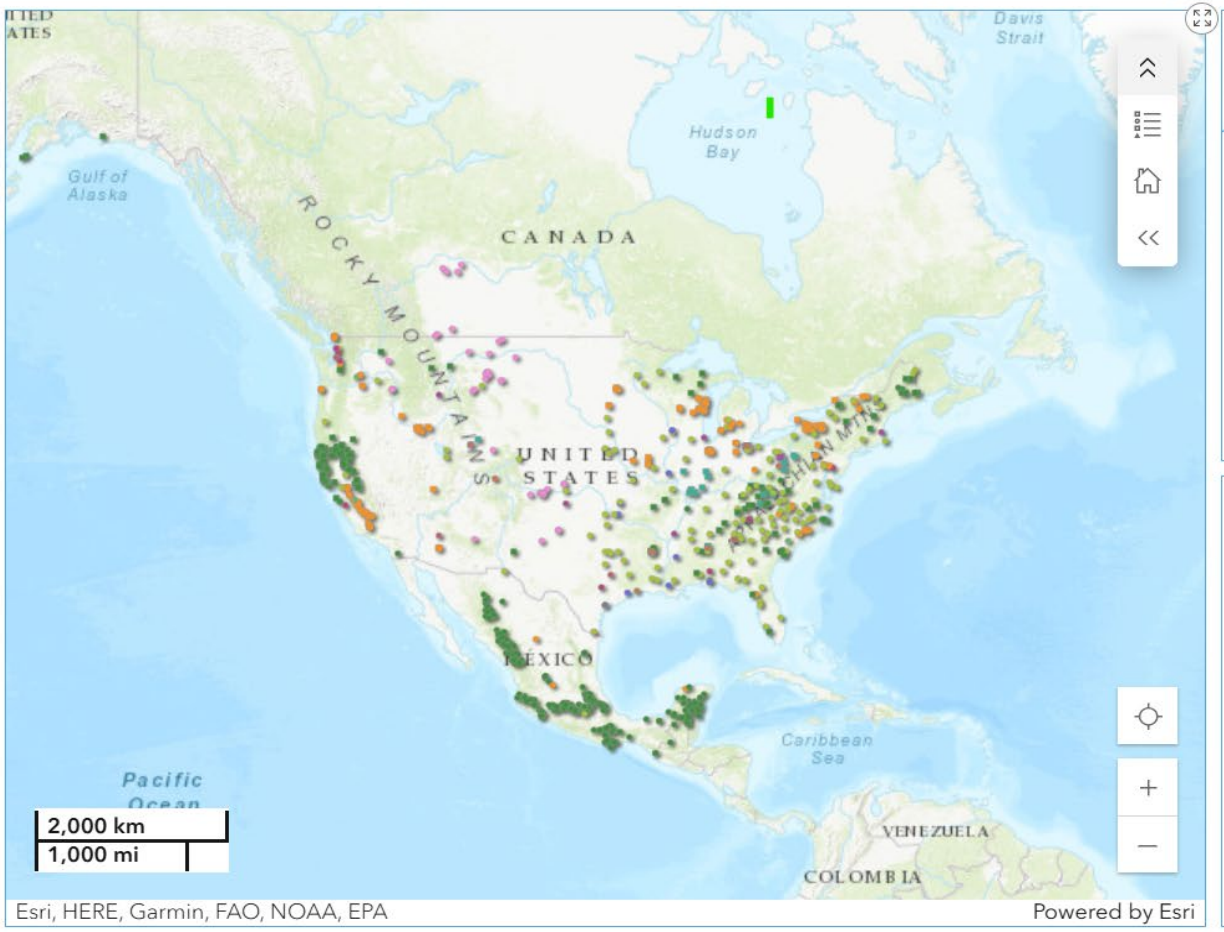
1.12k

Compliance projects use square icons. Additionally, you can filter by project type and select the protocols that indicate (ARB) to show all California compliance projects.

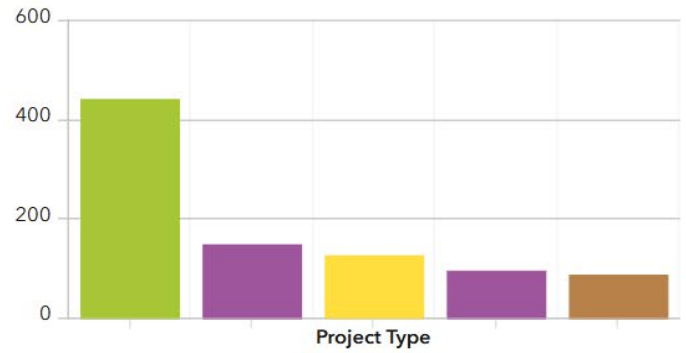
Status Definitions

Listed projects have paid the submittal fee and successfully met eligibility requirements and other aspects set forth within the appropriate protocol.

Registered projects change from "Listed" the first time they are verified and accepted by the Reserve.



Projects by Type

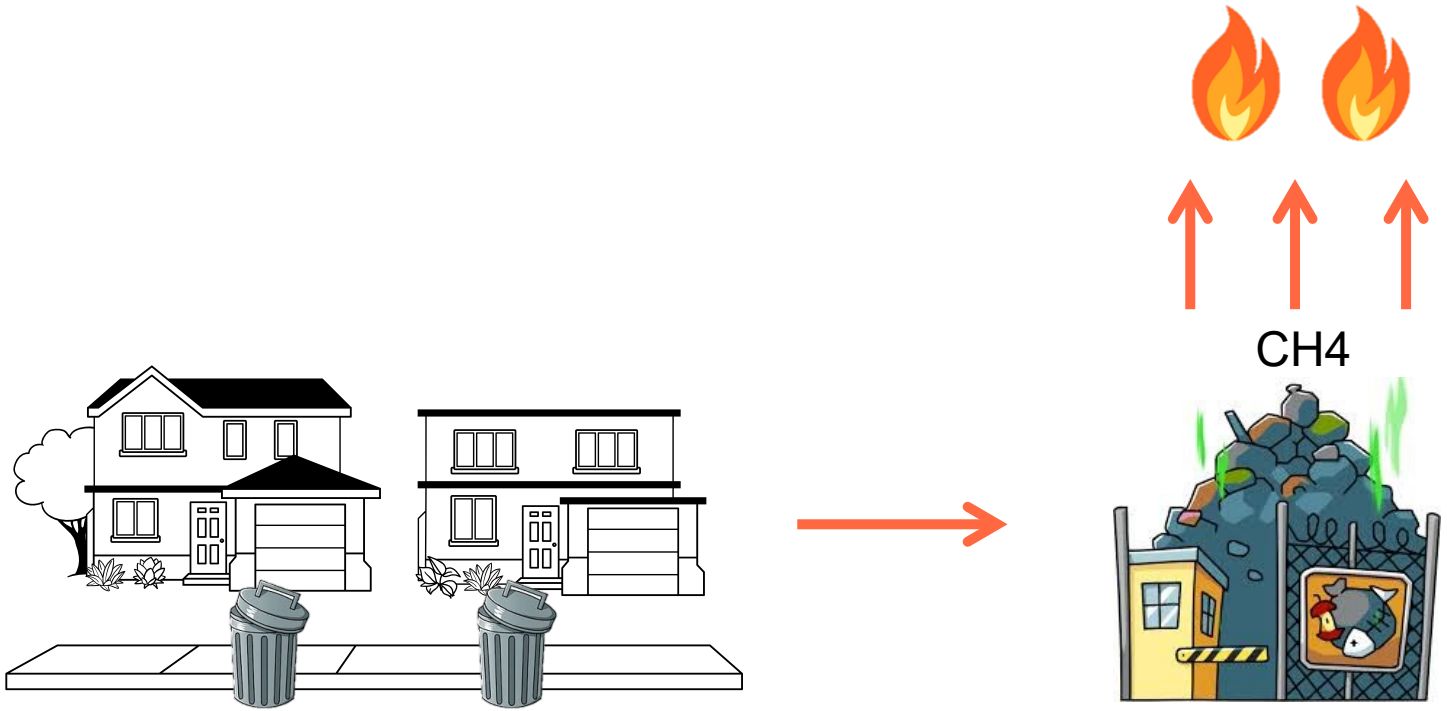


As of 6/3/2025. For questions, please contact jmao@climateactionreserve.org

What is an Offset Credit Project?

An offset credit project is an activity or set of activities that:

- Reduce GHG emissions,
- Increase the sequestration or storage of carbon removed from the atmosphere.



Principles of the Reserve Program

All registered projects and credits issued by the Reserve must be:

ADDITIONAL	VERIFIED	REAL	PERMANENT	ENFORCEABLE
• Beyond common practices • Beyond regulatory requirements	• Standardized eligibility criteria and quantification methodologies • Independent third-party review.	• Conservative emissions accounting • Prescriptive models and equations • Uncertainty reduction	• Monitoring and reporting processes • Any leakage or loss is quantified and compensated	• Processes to ensure program compliance • Accountability mechanisms

- The Reserve seeks to be practical and ensures that projects do not have negative impacts
- The standards include social and environmental safeguards to ensure the participation and benefit of the participants

GHG Accounting Standardization

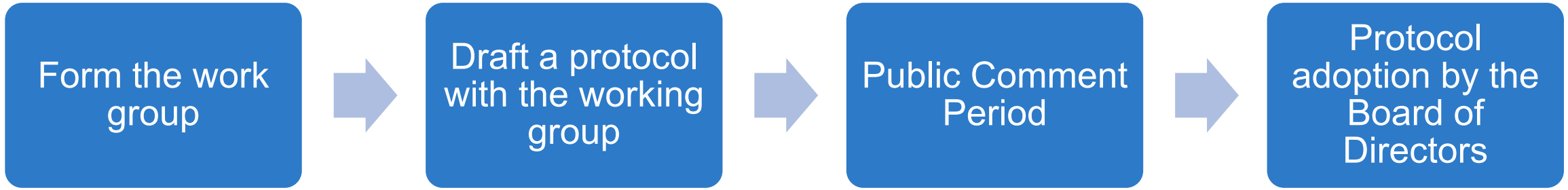
Two elements:

- Determination of project eligibility and additionality using standardized criteria rather than project-specific assessments.
- Quantification of GHG reductions/removals through a baseline established under certain assumptions, emission factors and monitoring methods.

Objetives:

- Minimize personal judgment in project assessment
- Reduce transaction costs for the project developer, minimize uncertainties for investors, and increase the transparency of the project when it is approved and verified

Rigorous, Inclusive and Transparent Process for the the Protocol Development



Inclusive Process: A balanced multi-stakeholder working group is formed with experts of the sector (landfill) and jurisdiction (Chile), state and federal agencies, environmental organizations, and other stakeholders.

Stakeholders that are not part of the working group can still participate in the process as "observers".

Transparent Process: All working group meetings and webinars for the public comment period are recorded and posted on the website, along with the drafts

Background: Why Landfill in Chile?

- **Landfill gas is composed of methane** (CH_4) and carbon dioxide (CO_2) in approximately equal concentrations, as well as smaller amounts of non-methane organic compounds (NMOC), nitrogen (N_2), oxygen (O_2) **and other trace gases.**
- If landfill gas is not collected and destroyed, over time, **this landfill gas is released to the atmosphere.**
- The disposal of solid waste represents an increasingly significant source of greenhouse gas emissions in Chile. According to the Fifth Biennial Update Report of Chile (2020), **emissions from waste disposal have increased by 681%** since 1990. This trend **highlights the urgent need to improve waste management and reduce its climate impact**.
- The Chile Landfill Protocol **will incentivize the collection and destruction of landfill gas.**

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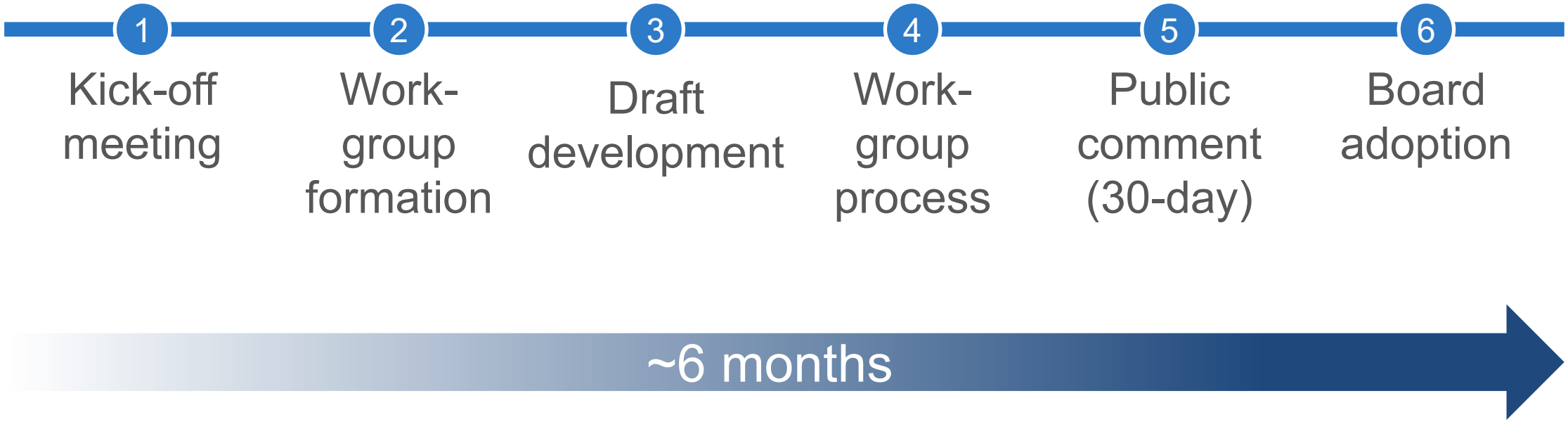
PROTOCOL DEVELOPMENT PROCESS & TIMELINE

Protocol Development Timeline



Invitación a Participar en el Desarrollo del Protocolo

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Stakeholder participation & feedback is critical to protocol development

How can you participate? Interested stakeholders are invited to submit one of two forms

Observer: Please submit the Stakeholder Engagement Form at any time
Technical workgroup: Please submit the **Statement of Interest**

Stakeholder Engagement form helps the Reserve identify & communicate with interested stakeholders throughout the protocol development process.

Who is the Working Group? An interested and experienced sub-group of stakeholders are identified to construct a technical workgroup to advise protocol development and produce rigorous, well-vetted, and credible protocols

Who are its members? The Reserve strives to construct a workgroup with a balanced representation from industry, project developers, farmers, environmental NGOs, verification bodies, independent consultants, academia, and government bodies

Statement of Interest Form by **July 16, 2025**

Workgroup Process and Expectations for Workgroup members

Process

- Reserve staff identify and solicit feedback on specific protocol criteria
- Reserve staff schedule and hold meetings in Spanish (likely 2-3)
- Reserve staff produce draft protocol for review
- Reserve staff revise protocol based on feedback

Expectations

- Participation of local stakeholders in Chile
- Familiarity with the technologies and/or end uses for which the protocol is being developed (landfill sector), and/or solid understanding of project-based GHG accounting
- Review, comment on and provide recommendations on specific protocol criteria
- Participate in meetings via webinar
- Provide written comments on draft protocol

Statement of Interest and Local Engagement

Statement of Interest – Workgroup

-Form for interested parties wishing to join the workgroup

-Selected members will commit to: Participate in meetings, provide comments, review protocol, actively participate during workgroup meetings

-Only 15-30 participants will be selected

-An email will be sent out to selected candidates

-Persons not selected in the workgroup may be included as “observers”

Local Engagement

-Participate as an observer during the development of the protocol

-Observers will receive invitations to the workgroup meeting, but participation is limited to silent mode with the opportunity to send comments via chat

-Can submit comments during the public comment period

-Deadline: ongoing

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KEY CONSIDERATIONS FOR PROTOCOL DEVELOPMENT

Adapting the Landfill Protocol to Chile

- Use the Mexico, Argentina, and U.S. Landfill Protocol as a base
  - Facilitate protocol development
  - Mexico Landfill is a comprehensive protocol with over 15 years since its publication
  - Worked with MexiCO2 and EnergyLab to facilitate the partial financing and technical support of the initial adaptation to Chile

- The main changes will include:
  - Evaluate Chile's laws, regulations, and common practice
  - Evaluate need for applicable safeguards
  - Review with Chile stakeholders

Key considerations for protocol development

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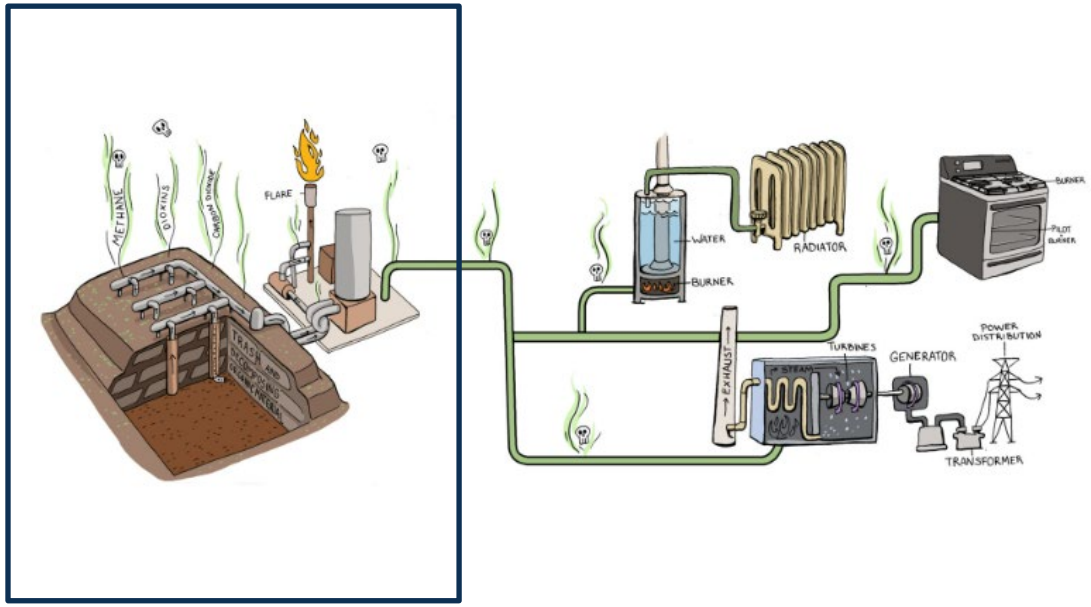
- Project definition
- Project ownership
- Additionality
- Quantification
- Monitoring
- Reporting & Verification

Project Definition

- **Collection of methane gas** from one or more specified cells at an eligible landfill, and the destruction of such methane from **one or more destruction devices.**
- **Expansion of an existing** gas collection and control system (**GCCS**) to a new cell(s) can be optionally included within existing project or submitted as new project.
- **Captured Landfill Gas (LFG) may be**
  - Destroyed on site
  - Transported for offsite use. Regardless, the ultimate fate of the LFG must be destruction.
- **Qualified devices includes:**
  - Utility flares, enclosed flares, engines, turbines, microturbines, boilers, pipelines, leachate evaporators, kilns, sludge dryers, burners, furnaces, or fuel cells.
  - Other devices may be eligible, pending Reserve approval

Project Definition



Carbon project limits

An eligible landfill is one that:

1. **Is not subject to regulations or other legal requirements requiring the** destruction of methane gas;
2. **Is not a bioreactor,** as defined by the U.S. EPA:

   "a MSW landfill or portion of a MSW landfill where any liquid other than leachate (leachate includes landfill gas condensate) is added in a controlled fashion into the waste mass (often in combination with recirculating leachate) to reach a minimum average moisture content of at least 40 percent by weight to accelerate or enhance the anaerobic (without oxygen) biodegradation of the waste."; and

3. **Does not add any liquid other than leachate** into the waste mass in a controlled manner.

Project Ownership

- **Project developer** is an entity with an active account on the Reserve and is responsible for all project monitoring and verification. Project developers can be:
  - Landfill owners and operators
  - GHG Project financiers,
  - Energy or utility company
  - Or other entities
- Must have clear ownership of the reductions and established through **explicit title** and must sign the Attestation of Title
  - May be contracts in place between facility owner and project financiers

Eligibility Rules

Eligibility Rule I: Location

Eligibility Rule II: Project Start Date

Eligibility Rule III: Project Crediting Period

Eligibility Rule IV: Additionality

Eligibility Rule V: Regulatory Compliance

Location

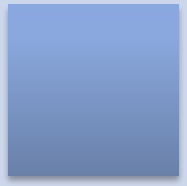
- Applies only to Chile

Encyclopedia Britannica, Inc

Project Start Date

No more than 90 days after the LFG is first destroyed by a project destruction device, regardless of whether there's sufficient monitoring

Projects must be submitted to the Reserve within 12 months after the project start date



Destruction devices that were installed temporarily and used only for pilot or test purposes. Must be limited to 9 months.

Project Crediting Period

- The crediting period is defined as **10 years following the project's start date**
- **Eligible up until** a regulatory body **legally requires** the landfill to install a gas collection and control system.
- **May apply for a renewed crediting period**
  - ✓Project lifespan: 3, 10-year crediting periods for 30 years total
  - ✓Must apply within 6 months of the end of the final reporting period
  - ✓Must meet the requirements of the newest version of the protocol

🗓️ Project Start → 10 yrs → 🔁 Renewal → 10 yrs → 🔁 Renewal → 10 yrs (Max 30 yrs)

Additionality

- Must be above and beyond business-as-usual scenarios
- Must pass two additionality eligibility rules:

Performance Standard Test

- Better than business-as-usual
- Practice-based threshold that focuses on the baseline scenario and changes made in the project scenario

Legal Requirements Test

- Passes when there are no laws, statutes, regulations, court orders, environmental mitigation agreements, permitting conditions, or other legally binding mandates requiring project activities

📌 **Project becomes ineligible** the moment destruction is legally required

Performance Standard Test

1. Installation of an LFG collection system and a new qualifying destruction device at an eligible landfill where landfill gas has never been destroyed prior to the start date.
2. Installation of a new qualifying destruction device at an eligible landfill where LFG is currently collected and vented but never destroyed prior to the start date.
3. Installation of a new qualifying destruction device at an eligible landfill where LFG was collected and destroyed prior to the start date using:
    a. A non-qualifying destruction device (e.g., passive flare); or
    b. A destruction device not otherwise eligible (e.g., qualifying device installed prior to the project start date)

Performance Standard Test

4. Installation of a new gas collection system on a physically distinct cell(s) where neither gas collection nor destruction has previous occurred, and connection of this new collection system is connected to an existing LFG destruction system.

- The new collection system must have its own meter that meets the requirements of the Protocol.
- There can be more than one project in the same landfill.

Performance Standard Test

To ensure additionality of the emission reductions for projects with baseline destruction:

- Closed landfills with baseline qualifying flares
  - must deduct the amount of methane collected by the baseline landfill gas wells and destroyed by the qualifying flare.
- Installation of a new gas collection system on a physically-distinct cell (or cells) where neither gas collection nor destruction has previously occurred.
  - The appropriate amount of methane shall be deducted according to the protocol scenarios.
- Installation of a new destruction device where previously collection and destruction had occurred
  - Landfills with a baseline non-qualifying device (i.e., scenario 3a) must be deducted the amount of methane destroyed by the device.
  - Landfills with a baseline qualifying device (i.e., scenario 3b) must deduct the amount of methane that could have been destroyed if the device was operating at full capacity.

Regulatory Compliance

- Must attest that the project is in compliance with all laws applicable to the project activity
- Required to disclose any and all instances of legal violations – material or otherwise – caused by the project or project activities
  - "caused" by Project activities if it can be reasonably argued that a violation would not have occurred in the absence of the project activities
- If a violation is caused by project activities, credits will not be issued for the period of the violation
  - Administrative or violations due to "acts of nature" will not impact crediting
  - Re-occurring violations due to intent or negligence may impact crediting

Technical Workgroup Considerations

- Application of Article 16 of DS 189/2005:
  - "Every sanitary landfill project must include a biogas management system designed based on a projection of the amount of biogas that will be generated, ensuring safety conditions both within the site and in its surrounding areas."
- Reserve understanding: to date large landfill sites have complied with Article 16 through burning the minimum amount of methane to ensure safety, generally considered to be 5% → the Reserve would apply a proportionate discount to the baseline to ensure gas that is flared to comply with the law is not credited

Social and Environmental Safeguards

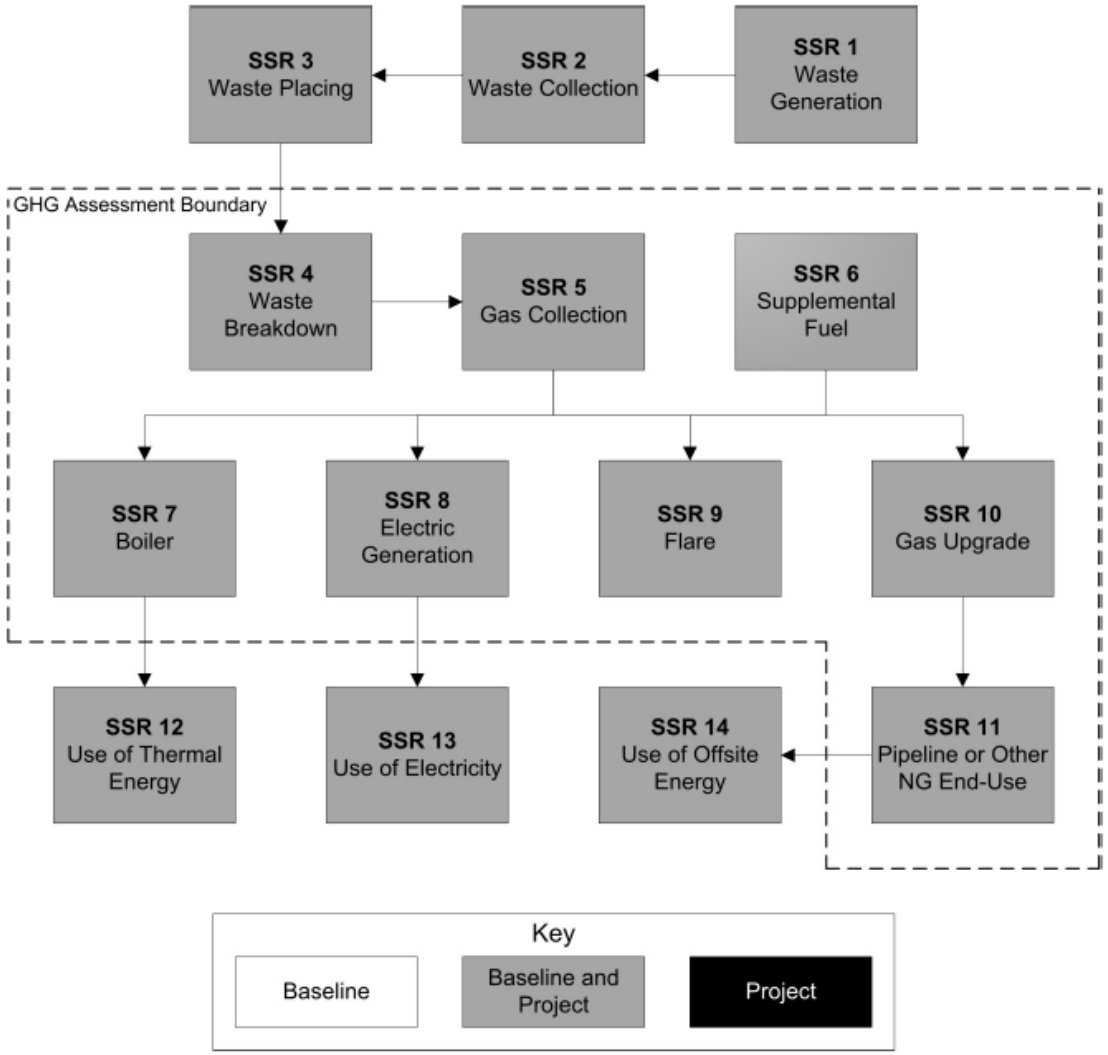
- Social Safeguards
  - Free, Prior, and Informed Consent (FPIC)
  - Ongoing Notification, Participation, and Documentation
  - Labor and Safety
  - Dispute Resolution

- Environmental Safeguards
  - Air and Water Quality
  - Mitigation of Pollutants

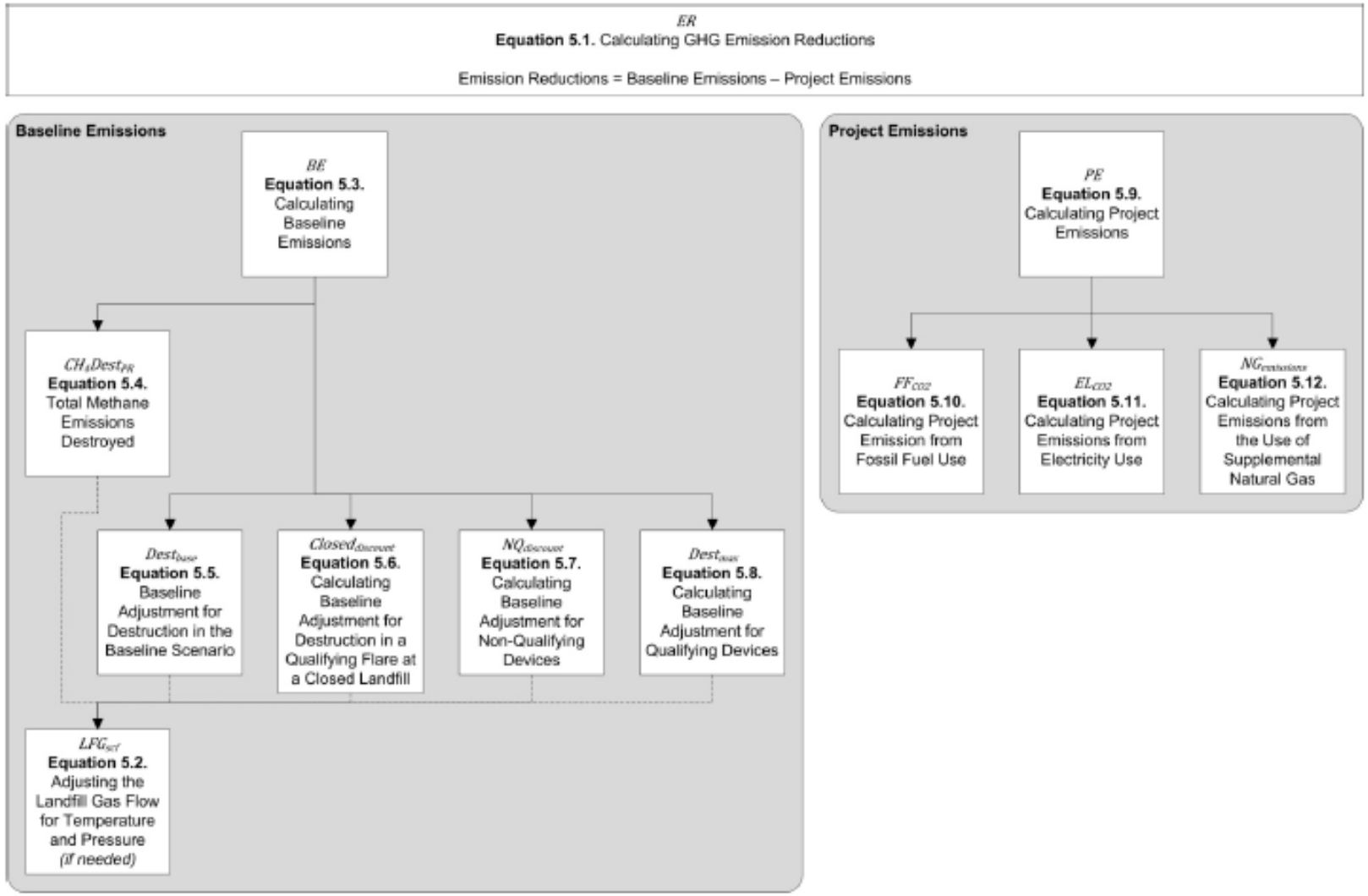
Transfer Projects

- Projects may transfer to the Reserve based on meeting eligibility criteria under the Reserve protocol
- Key considerations:
  - Project start date definition: destruction of landfill gas
  - Crediting period: max 30 years
  - Compliance with safeguards and
  - Project transfer approval
    - Registry transfer form found online (must have account with the Reserve)

GHG Assessment Boundary



Quantifying GHG Emission Reductions



Project Monitoring

- Must monitor:
  - Flow of LFG delivered to each destruction device
  - Fraction of methane in the LFG delivered to the destruction device
  - Operational activity of the destruction device(s)
  - Operational status of the destruction device(s)
    - Or presence of safety shut off valve
- Flow data must be corrected for temperature (0°C) and pressure (1atm) either internally or calculated

Instrument QA/QC

- All gas flow meters and continuous analyzers must be:
  - **Cleaned and inspected** on a regular basis, at a minimum per manufacturer specifications, with activities and results documented by site personnel
  - **Field checked for calibration** accuracy with percent drift documented at the end of but no more than 2 months prior to the end of the reporting period
  - **Calibrated by the manufacturer** or a certified calibration service per manufacturer's guidance or every 5 years if not specified by the manufacturer

Reporting Period and Verification Cycle

Reporting period

- Period in which the project developer quantifies and reports reductions to the Reserve
- Cannot exceed 12 months

Verification period

- Period of time over which reductions are verified
- Initial verification period can only cover one reporting period

Max 24 months

Reporting Requirements without Verification:

12-every month

Initial Verification (max. 24 months of data))

→

Following verifications
(Up to 2 reporting periods of 12 months = 1 verification period max. 24 months)

→

Monitoring Data Reports
If your verification period covers 2 reporting periods: you have to submit a monitoring report within 6 months of the end of the first reporting period.

Protocol Development Process & Timeline

Milestone	Date
Public kick-off meeting	July 1, 2025
Statements of Interest Form (Workgroup)	**July 16, 2025**
Formation of workgroup	July 2025
Tentative date for first workgroup meeting	August 2025
Tentative date for second workgroup meeting	August 2025
Tentative date for third workgroup meeting (if needed)	September 2025
Public comment period	September-October 2025
Protocol presented to Reserve Board for approval	October 2025

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NEXT STEPS

Next steps

- ***For interested stakeholders:***
  - Submit Stakeholder Engagement Form
  - **Submit a Statement of Interest to become a workgroup member (by July 15, 2025)**
  - Email interest to sign up for updates as an observer
  - Email us feedback anytime
- ***For Reserve:***
  - Form workgroup
  - Finalize draft protocol
  - First Workgroup meeting in August 2025 (via zoom)

Key contacts

Climate Action Reserve:

Protocol development lead:

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Miguel Lopez Delgado, Manager - LATAM

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THANK YOU!