CLIMATE ACTION RESERVE

Chile Landfill Protocol V1.0

Workgroup Meeting #1

August 06, 2025

Introduction

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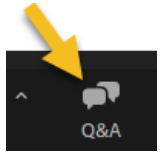
Housekeeping

- **Participation of Workgroup members (WG)**
  - WG can actively participate throughout the meeting
  - Please, keep yourselves muted unless/until would like to speak
  - We will ask and take questions throughout the session. Please use “the raise your hand function.”
- **Participation of attendees/observers**
  - Will remain in listen-only mode
  - May submit questions in the question box 

- **Follow-up and materials**
  - 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

AGENDA

- Introductions
- Process Overview
- Protocol Considerations
  - Project Definition – Eligible landfill
    Project Ownership
  - Social and Environmental Safeguards
  - Parameters/Default Values
- Open Discussion
- Next Steps

CLIMATE ACTION RESERVE

CLIMATE ACTION RESERVE

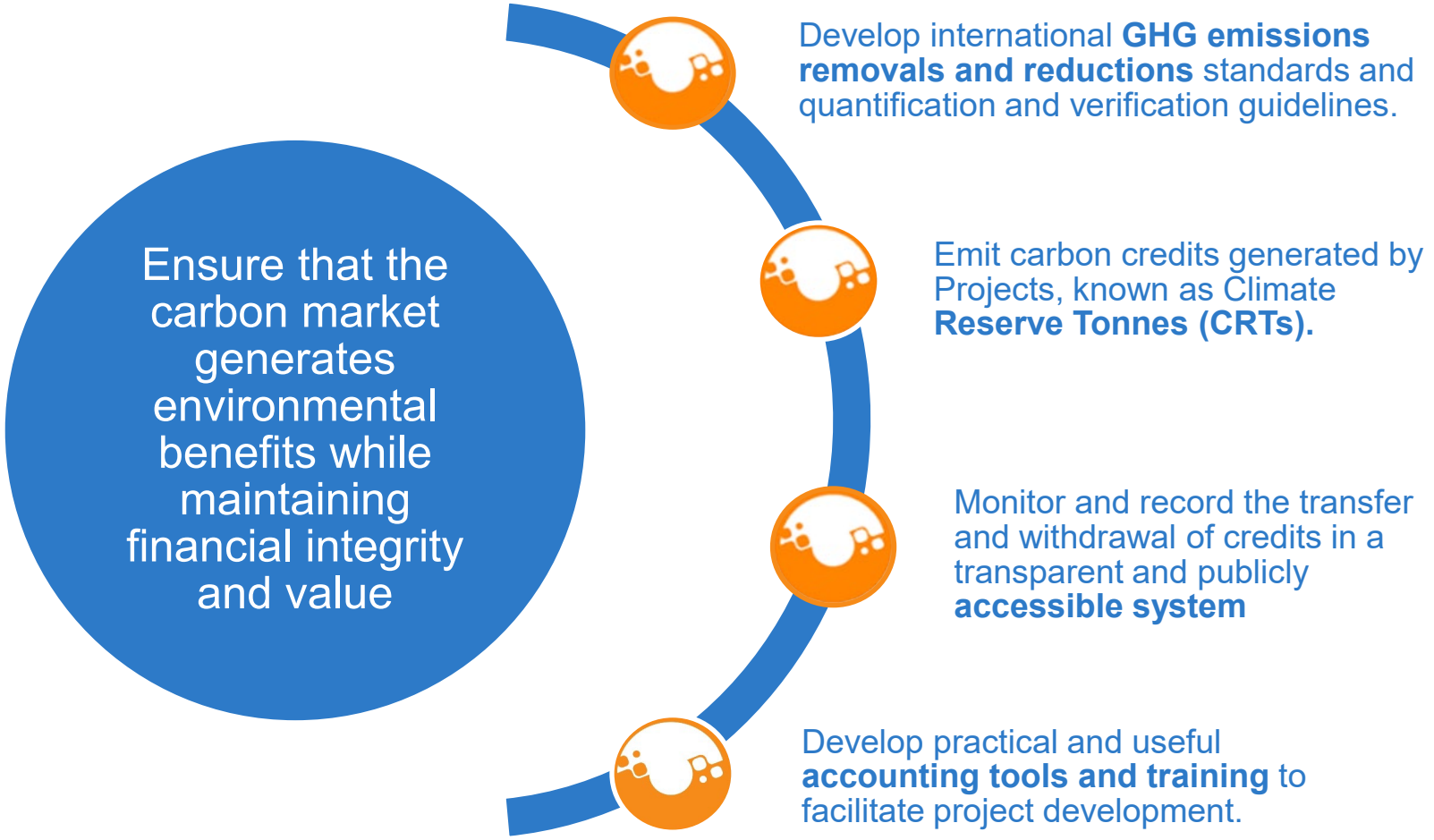
INTRODUCTIONS

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	Status	Country	State	Project ID	Project Video
Select	Select	Select	Select	Select	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.

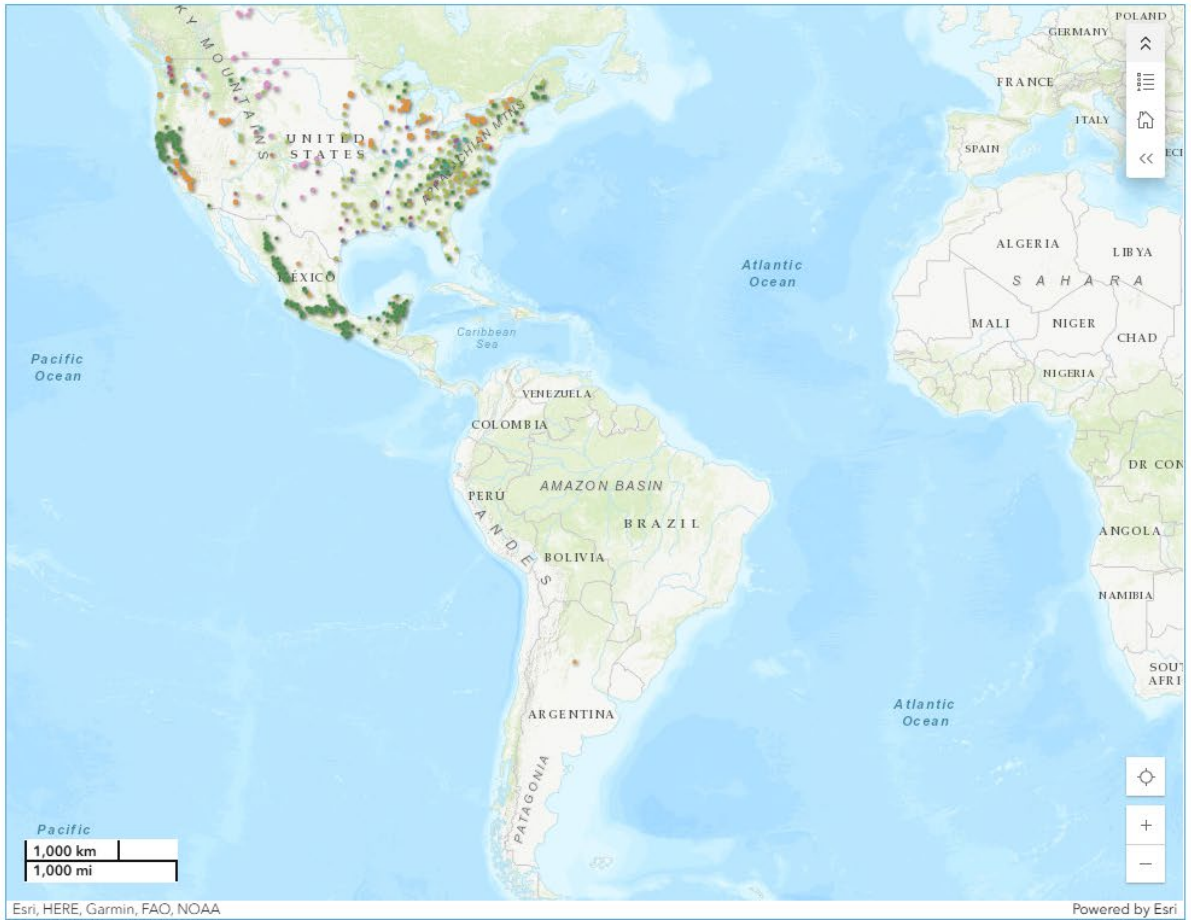
Status Definitions

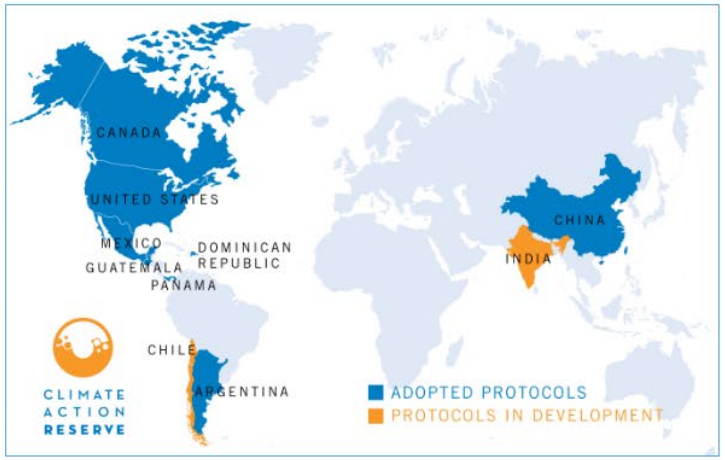
Listed projects have paid the submittal fee and successfully met eligibility requirements and other aspects set forth within the appropriate protocol.

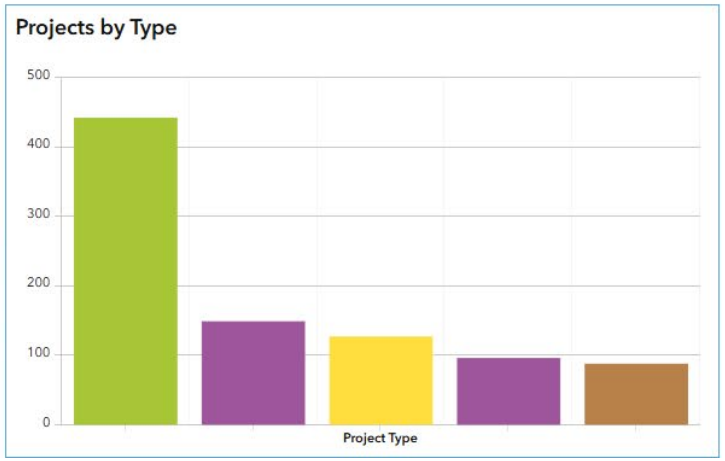
Registered projects change from "Listed" the first time they are verified and accepted by the Reserve.

Completed projects have reached the end of their crediting period(s) and are no longer being issued CRTs.

Transitioned projects have been listed and successfully completed a verification under the Compliance Offset Program, but have any number of early action eligible CRTs remaining active or retired in the Reserve program.



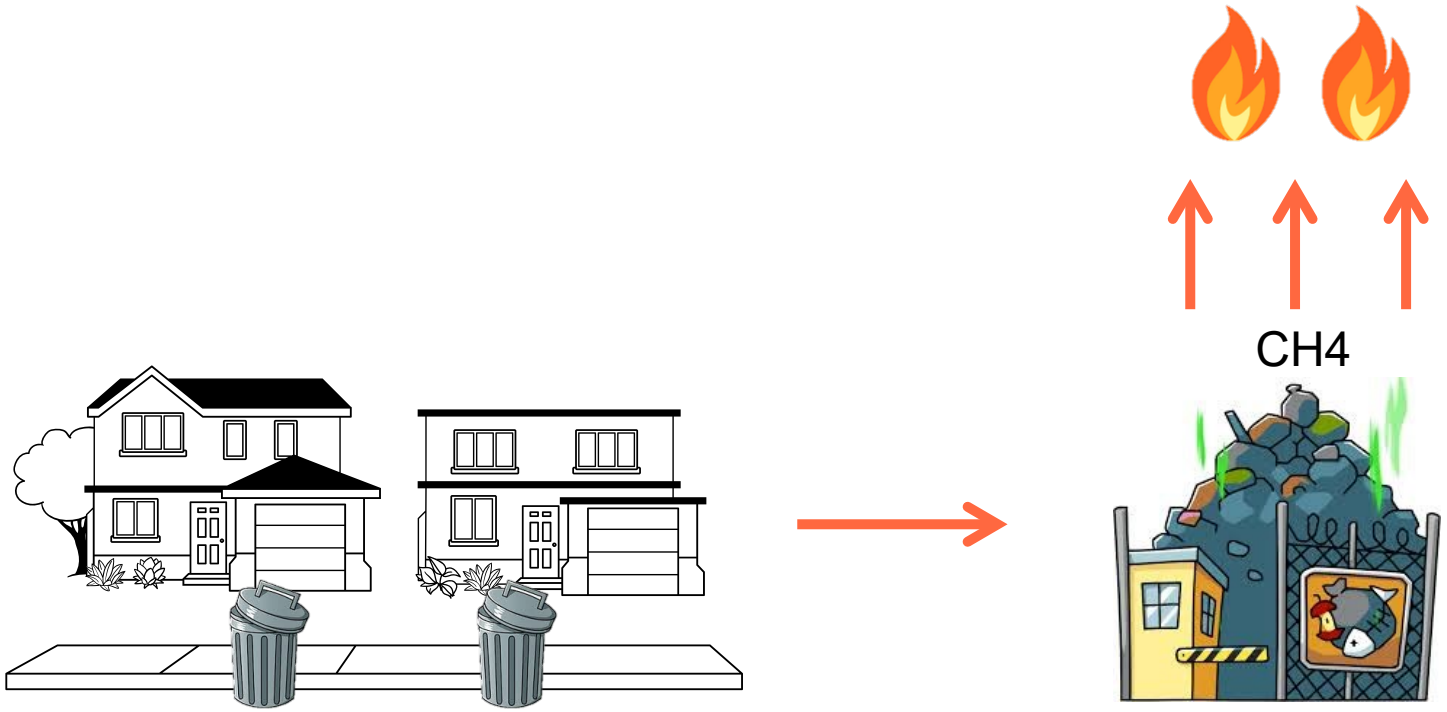




What is an Offset Credit Project?

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:

ADITIONAL

Beyond common practices

Beyond regulatory requirements

VERIFIED

Standardized eligibility criteria and quantification methodologies

Independent third-party review.

REAL

Conservative emissions accounting

Prescriptive models and equations

Uncertainty reduction

PERMANENT

Monitoring and reporting processes

Any leakage or loss is quantified and compensated

ENFORCEABLE

Processes to ensure program compliance

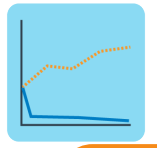
Accountability mechanisms

- 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

Workgroup Members

Organization (Alphabetical)	Name
Energylab	Cristian Mosella
ImplementaSur	Gerardo Canales
Grupo de Residuos Solidos Pontifica Universidad Catolica de Valpareiso Chile	Marcel Szanto Narea
KDM Empresas	
Mexico2	David Colín
Núcleo Biotecnología Curauma Pontificia Universidad Católica de Valparaíso	Andres Morales
Superintendencia del Medio Ambiente Gobierno de Chile	Karin Salazar
Superintendencia del Medio Ambiente Gobierno de Chile	Christian Calderón Duarte
Sustentalia Consultores	Javiera Labbé
Unicarbon	Nuno Bardosa
VOLTA SpA	Pedro Alarcón Retamal
Windfall Bio	McKenzie Wilson

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PROCESS OVERVIEW

Purpose

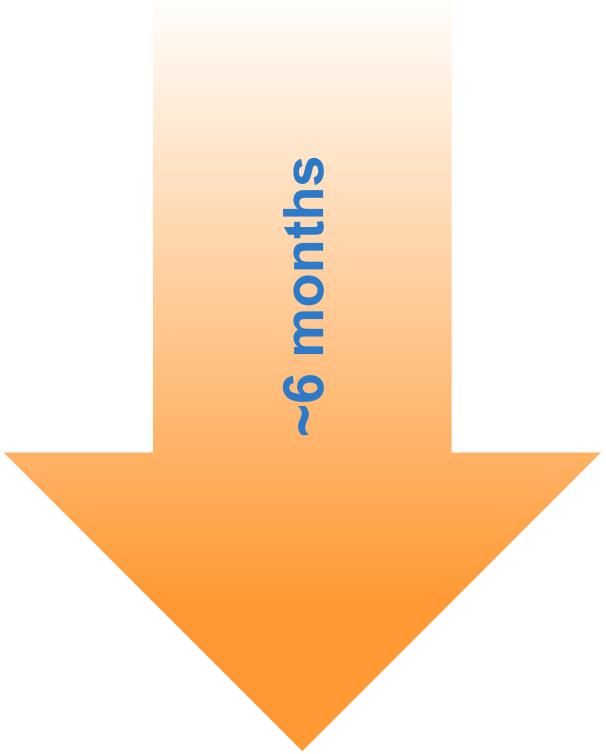
- To familiarize workgroup members with offset protocol development process – what we typically want in an offset protocol
- To present and solicit feedback from workgroup members on key considerations for the Chile Landfill Protocol Version 1.0
- Provide draft protocol for reference and then revisions

Protocol Development Overview

- **GOAL**: To create a robust Chile Landfill Protocol that provides best practices for GHG accounting to generate Climate Reserve Tonnes (CRTs)
  - Incentivize the capture and destruction of methane emissions from landfill operations
  - Direct carbon finance to the landfill sector and make biogas control system projects more financially attractive to investors
  - Adhere to high quality offset criteria and Reserve's principles
  - Leverage lessons learned from the Reserve's Mexico and US Landfill Protocols
  - Solicit and incorporate expert stakeholder feedback

Protocol Development Timeline

1. Kick-off meeting (*July 1 2025*)
2. Workgroup process
   - Formation (*July 2025*)
   - Meeting 1 (*today – August 6, 2025*)
   - Meeting 2 (*August 27, 2025 – tentative*)
   - Meeting 3 *(September 2025 – tentative)*
3. 30-day public comment period (TBD *2025*)
4. Propose to Board adoption *(TBD 2025)*



Timeline Process Detail

	Jul	Aug	Sep	Oct	Nov	Dic	Jan	Feb
Public webinar	1st							
Workgroup formation	17th							
1st workgroup meeting (webinar)		6th						
2nd workgroup meeting (webinar)		27th						
3rd workgroup meeting (webinar)			TBD					
Drafting/content development								
Public comment period & webinar (30 days)								
Staff revisions based on feedback								
Internal reviews/formatting								
Deliver Board draft								
Public Board meeting							TBD	

Workgroup Process and Expectations

CAR/Process:

- Manage the protocol development process
- Hold 2 or 3 workgroup meetings
- Reserve staff identify and solicit feedback on specific protocol criteria
  - **Specific questions for WG will be highlighted in red**
- Reserve staff will share the draft protocol with WG
- Revise protocol based on feedback

WG/Expectations:

- Attend all (~2-3) workgroup sessions
- Be active participants: provide input and ask questions on protocol concepts and language
- After meetings, share additional input and expertise as needed
- Review draft protocol and provide written feedback to Reserve staff
- Be constructive, collaborative, and productive

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PROTOCOL CONSIDERATIONS

Project Definition

- **Collection** of methane gas from one or more specified cells at an eligible landfill, **and destruction** of such methane by one or more destruction devices.
- **Expansion of an existing gas collection and control system** (GCCS) to a new cell or cells. May optionally be included within an existing project or submitted as a new project.
- **Captured landfill gas (LFG) can be destroyed**
  - **on-site or**
  - **transported for off-site use**. In either case, the final destination of the LFG must be destruction.
- **Qualifying devices** include
  - utility flares, enclosed flares, engines, turbines, microturbines, boilers, pipelines, leachate evaporators, furnaces, sludge dryers, burners, kilns or fuel cells.
  - Other devices may be eligible, subject to approval by the Reserve.

Project Definition

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

Landfill definition & regulation in Chile.

What permits and documents must a landfill have to operate according to the current rules/regulations at national and provincial level?

Project Definition

- ✓ Captured landfill gas could be **destroyed on-site**, **transported for off-site use** e.g., through a gas transmission and distribution pipeline), or used to power vehicles.
- ✓ **The ultimate fate of the methane must be destruction**. Regardless of how project developers take advantage of the captured landfill gas, for the project to be eligible to register GHG reductions
- ✓ **Under this protocol, Passive flares do not qualify** as eligible destruction devise
- ✓ In addition to reducing methane, the installation and **operation of a landfill gas collection and destruction system could impact anthropogenic CO2 and methane emissions** associated with the consumption of electricity and fossil fuels.
  - Depending on the project's particular circumstances, this effect could either increase or decrease operational GHG emissions. (Section 4, the GHG Assessment Boundary, delineates the scope of the accounting framework).

Project Definition

- ✓ **Landfill gas collection and destruction systems** typically consist of wells, pipes, blowers, caps, and other technologies that enable or enhance the collection of landfill gas and convey it to a destruction technology. At some landfills, a flare will be the only device where landfill gas is destroyed.
- ✓ For **projects that utilize energy or process heat technologies to destroy landfill gas**, such as turbines, reciprocating engines, fuel cells, boilers, heaters or kilns, these devices will be where landfill gas is destroyed. Most projects that produce energy or process heat also include a flare to destroy gas during periods when the gas utilization project is down for repair or maintenance.
- ✓ **Direct use arrangements which entail the piping of landfill gas to be destroyed by an industrial end user at an off-site location** are also an eligible approach to destruction of the landfill gas. For instances of direct use, agreements between the project developer and the end user of the landfill gas (i.e., an industrial client purchasing the landfill gas from the project developer), must include a legally binding agreement to assure that the GHG reductions will not be claimed by more than one party.

Does a landfill gas collection and destruction system in the Chilean context resemble with the above mentioned?

Other considerations

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 facility operators,
  - GHG project developers,
  - other entities such as municipalities, or waste management companies
- 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

Are there any special ownership conditions for Landfills in Chile that should be considered?
What documents should verifiers review to confirm ownership of Landfill facilities in Chile?

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

Project Crediting Period

- 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 GCCS
- **May apply for a renewed crediting period**
  - ✓Project lifespan:
    - 2 or 3, 10-year crediting periods for 20-30 years total
  - 🗓️ Project Start → 10 yrs → 🔁 Renewal → 10 yrs → 🔁 Renewal → 10 yrs (Max 30 yrs)
  - 🗓️ Project Start → 10 yrs → 🔁 Renewal → 10 yrs → (Max 20 yrs)
  - ✓Must apply within 6 months of the end of the final reporting period
  - ✓Must meet the requirements of the newest version of the protocol
  - ✓Legal landscape and common practice is assessed every renewed listing review

Additionality

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

1. **Performance Standard Test**
   - Better than business-as-usual
   - Practice-based threshold that focuses on the baseline scenario and changes made in the project scenario
2. **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

📌 *No longer eligible on the date destruction becomes legally required*

Additionality

Analysis of the Common Practice - Development of the Performance Standard Threshold

For this protocol, the Reserve uses a practice-change threshold that focuses on the baseline scenario and changes made in the project scenario.

- The analysis must be based on available reliable official data from Chile
- Two types of best practices must be determined to define the performance standard threshold: first, **the use of landfills** as a final solid waste disposal technology instead of other technologies, such as open dumps or controlled sites; and second, **the use of LFG collection and destruction systems** instead of passive venting in landfills.

  - Definitions of the different types of final solid waste disposal methods in Chile
  - If possible, inventories related to the operation of each landfill that include specific data regarding the current status of their existing venting systems (wells) and/or passive or spontaneous flaring systems.
  - Impact of CDM and other international Standards on Common Practice
  - Is the installation of landfill gas collection and destruction systems a common practice in landfills in Chile?

Performance Standard Test

1. **Installation of a 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:
   I. A non-qualifying destruction device (e.g., passive flare); or
   II. A destruction device not otherwise eligible (e.g., qualifying device installed prior to the project start date)

Are there any active LFG destruction systems in Chile? Examples

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 to an existing LFG destruction system.
   - The landfill cell must be engineered in such a way that landfill gas cannot migrate between that cell and other landfill cells.
   - 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:

- ✓ 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.
- ✓ 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.
- ✓ Projects with existing GCCS that later adds a new, physically-distinct landfill cell must deduct destruction from a baseline qualifying or non-qualifying device, if applicable.

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
- For projects with multiple discrete source facilities (from GCCS project in both location and management), it may be possible to demonstrate a violation occurring at one source facility does not impact the eligibility of the entire project

Are there specific laws/regulations applicable to landfills in Chile?

What regulatory agencies oversee such legal violations?

Technical Workgroup Considerations

- **Law N.º 19.300 (General Environmental Law, 1994)** EIA/Environmental Permit
- **State Laws and Municipal Regulations** relating to Regional Solid Waste Management Plans and Landfills.
- Supreme Decree No. 189/2005 (Regulations on Basic Health and Safety Conditions in Landfills) defines the technical, health, and environmental requirements for the construction, operation, closure, and post-closure of landfills.
  - ART.16 "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

Social Safeguards

- **Free, Prior, and Informed Consent (FPIC)**
  - Project developers must address the following topics with the landfill operator prior to project approval:
    - Concepts of climate change and carbon markets.
    - Requirements associated with landfill projects, including ongoing monitoring, reporting, and verification (MRV).
    - Estimates of costs and benefits associated with the landfill project and the division of costs and distribution of benefits or benefit sharing. The source used for carbon pricing estimates must be disclosed.
    - After the topics have been addressed, landfill operators must approve the landfill project under this protocol and the project developer

Feedback?

Social Safeguards

- **Ongoing Notification, Participation, and Documentation:**
  - The project developer must review with the landfill operator on an annual basis the following topics:
    - Ongoing project activities, including MRV
    - Credits issued
    - Purchase agreements, project finances, and ongoing benefit sharing arrangements
  - Project notification and documentation must be presented to the landfill operator in an appropriate format and language to ensure understanding.
- **Labor and Safety:** The project developer must attest that the project is in material compliance with all applicable laws, including labor or safety laws.

Is there a specific law regarding the safety and labor of landfill operators?

Is there a regulatory agency the VB could contact to confirm compliance with the law?

- **Dispute Resolution/ No Conflicts:** The Reserve holds 30-day public comment on all listed projects prior to registration and has an ongoing dispute resolution process. Projects that receive material complaints will not be registered until a satisfactory dispute resolution plan has been approved.

Feedback?

Environmental Safeguards

- The environmental safeguard requirements include:
  - **Regulatory Compliance:** The project developer must attest that the project is in material compliance with all applicable laws, including environmental regulations (e.g., air and water quality).
    - What regulatory body oversees environmental regulations?
    - Is there a regulatory agency/ body the VB could contact to confirm compliance with the law?
  - **Mitigation of Pollutants:** Projects must be designed and implemented to mitigate potential releases of pollutants that may cause degradation of the quality of soil, air, surface and groundwater and project developers must acquire the appropriate local permits prior to installation to prevent violation of all applicable laws

Feedback?

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NEXT STEPS

Next steps

- ***For Interested Stakeholders:***
  - Still can submit Local Engagement Form
  - Email interest to sign up for updates as an observer
  - Email us feedback anytime
- ***For Reserve:***
  - Compile a notes summary on the discussion
  - Post recording, notes, and presentation to the webpage
  - Incorporate feedback from workgroup discussion
  - Identify areas of focus for next workgroup meeting (if needed)
- ***For Workgroup:***
  - Email feedback on today's discussion (by August 14th)
  - Look out for information for the next meeting's discussion topics
  - Tentative next Workgroup Meeting: August 27th , 11:00-13:00 Chile time – Comments?

Key contacts

Climate Action Reserve:

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THANK YOU!