CLIMATE ACTION RESERVE

Argentina Landfill Protocol V1.0

Workgroup Meeting #2

February 12, 2025

Introduction

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Housekeeping

- Workgroup members 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
- All other attendees/observers are in listen-only mode
- Observers are free to submit questions in the question box
- 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
  - Previous meeting pending questions
  - Social Safeguards MRV
  - The GHG Assessment Boundary
  - Quantifying GHG Emission Reductions
  - Project Monitoring & Monitoring Requirements
  - QA/QC requirements
- Open Discussion
- Next Steps

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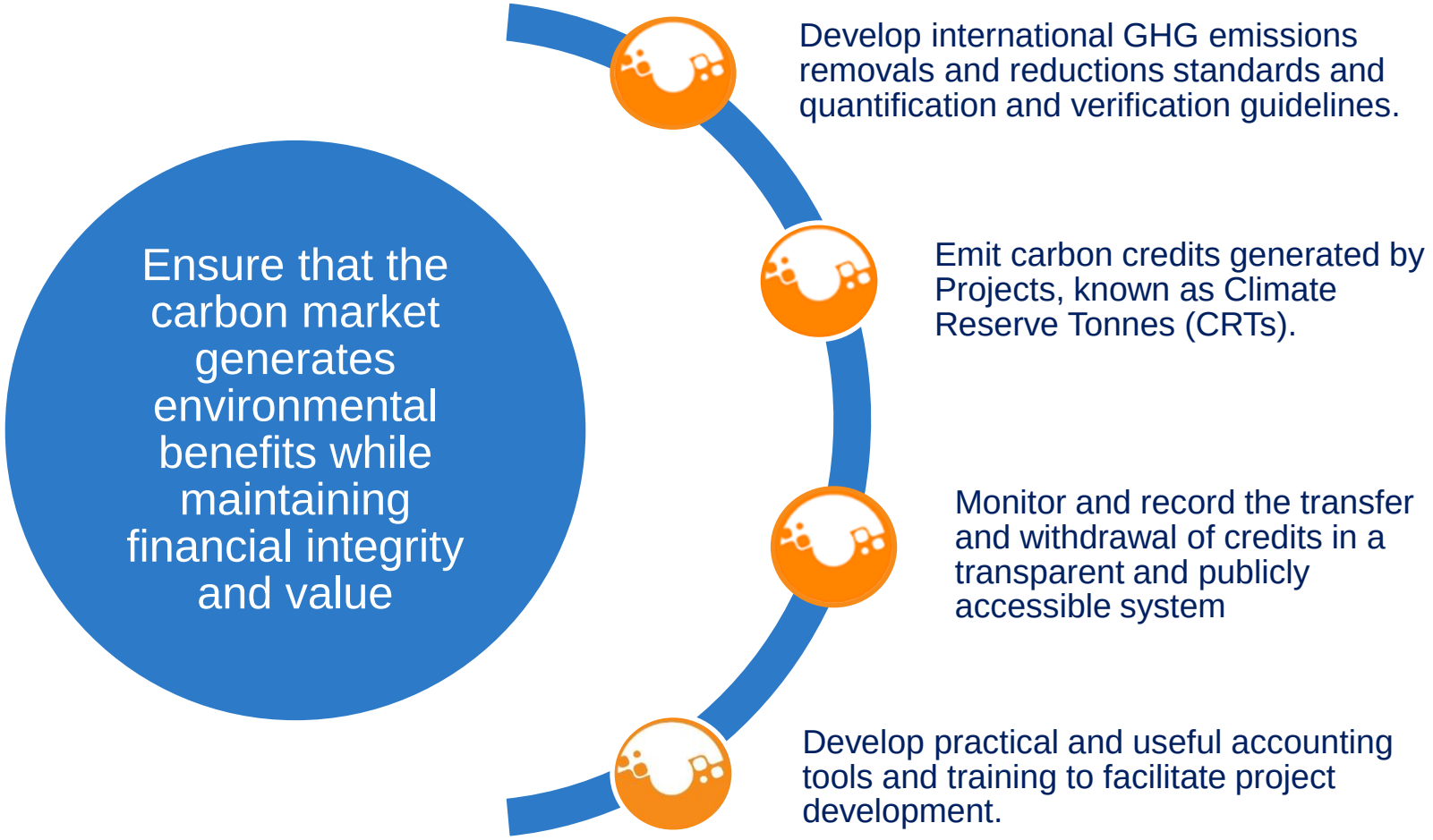
INTRODUCTIONS

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
- Accredited Offset Project Registry under the California cap-and-trade program
- Serve compliance and voluntary carbon markets
- 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

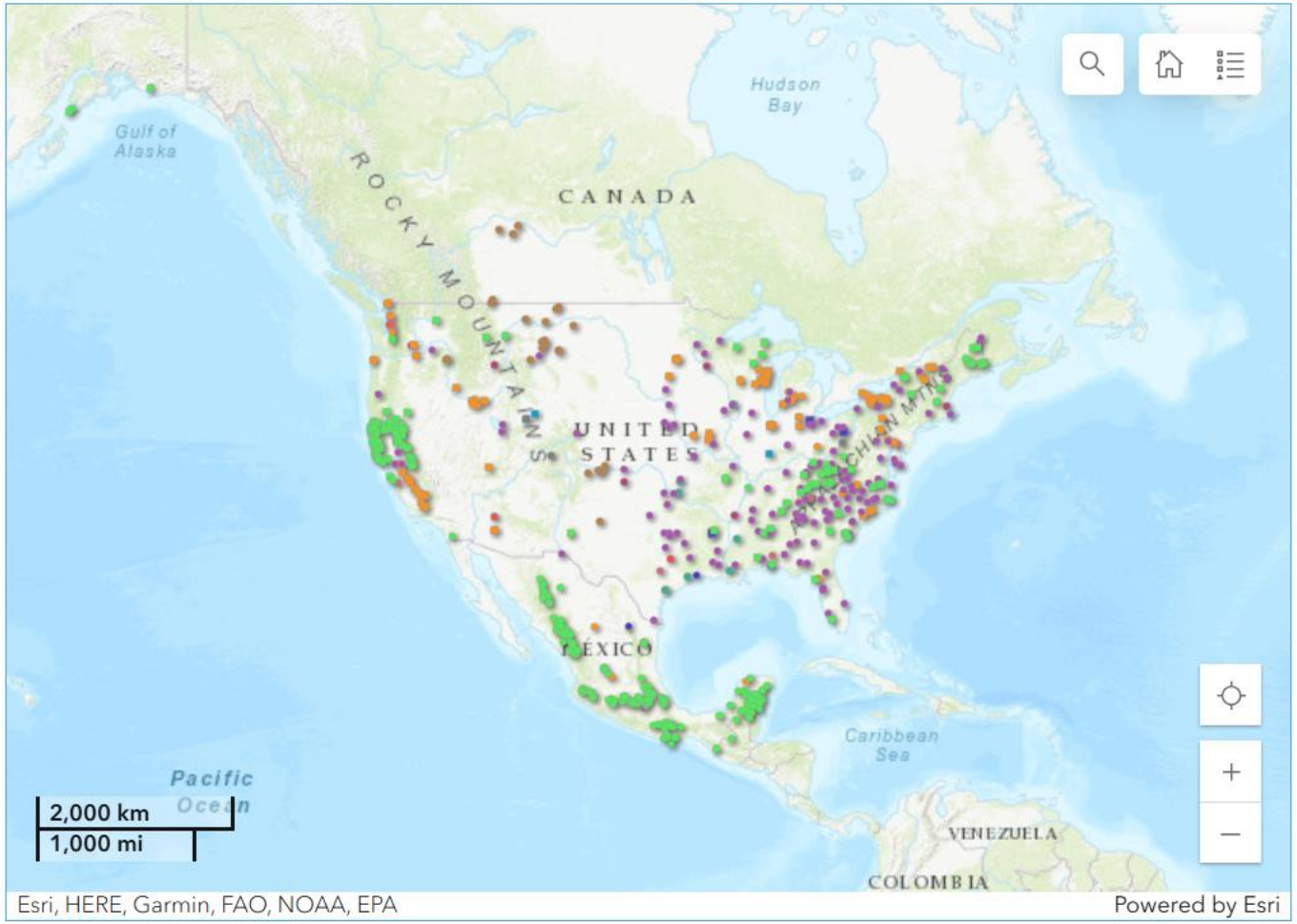
954

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.

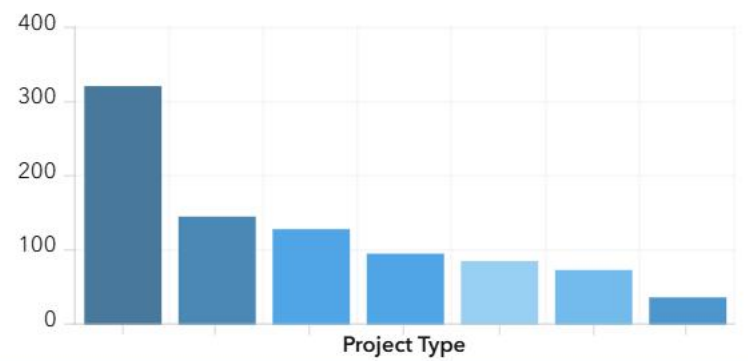
Status Definitions

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

Registered projects



Projects by Type



For questions, please contact jmao@climateactionreserve.org

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

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WORKING GROUP

Workgroup Members

Organization (Alphabetical)	Name
AOTA Carbon	Sami Osman
EMPAR Soluciones Ambiental	Brunel Alejandro
Gestión Ambiental y Desarrollo Sustentable - Gobierno de Chubut.	Fernando Pegoraro
HINS	Sofia Neyra
Independent Consultant	Jose Davila
Independent Consultant	Ana Marcela Villarroya
Independent Consultant	Nicolas Zeballos
Independent Consultant	Gisela Daniele
IRAM(Instituto Argentino de Normalización y Acreditación)	Jessica Wasilevich
LSQA Argentina	Alejandra N. Arribillaga
MexiCO2	David Colin
Ministerio de Ambiente y Economìa Circular de la Provincia de Córdoba	Germán Juri
Ministerio de Ambiente y Economìa Circular de la Provincia de Córdoba	Iriart Marine
Secretaría de Cambio Climático, Ministerio de Ambiente y Economía Circular de la provincia de Córdoba	Julia Coito
SEGAM CONSULTORA / Secretaría de Transición Energética, Ministerio de Infraestructura y Servicios Públicos de la provincia de Córdoba	Marcos Cena

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PROCESS OVERVIEW

Purpose

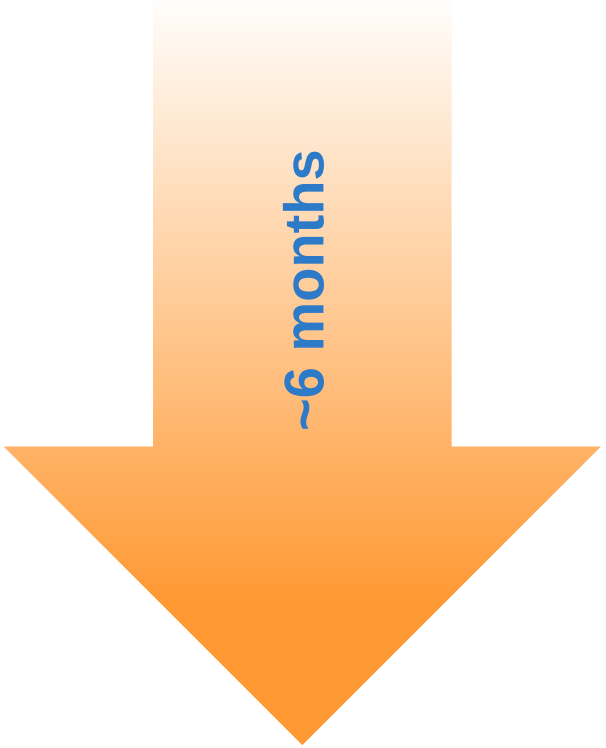
- To familiarize workgroup members with offset protocol development process – what we typically want in an offset protocol
- To present and solicit feedback from workgroup members on key considerations for the Argentina Landfill Protocol Version 1.0
- Provide draft protocol for reference and then revisions

Protocol Development Overview

- **GOAL**: To create a robust Argentina 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 (*November 27, 2024*)
2. Workgroup process
   - Formation (*December 2024*)
   - Meeting 1 (*January 22, 2025*)
   - Meeting 2 (today - *February 12, 2025*)
   - Meeting 3 *(March 5, 2025 – tentative)*
3. 30-day public comment period (April-May *2025*)
4. Propose to Board adoption *(June 2025)*



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

Previous meetings pending questions

- Methanization in terms of the Landfill Protocol.
- Evapotranspiration Pools and their role in landfills.
- Examples of active Landfill Gas Collection and Control Systems and applicable destruction devices in use in the jurisdiction.
- Further information on the national, provincial, and/or local environmental permits and documents required to operate a landfill.
- Further information on the special ownership conditions for Landfills in Argentina that should be considered in the protocol. What documents should verifiers review to confirm ownership of landfill facilities in Argentina
- Review of the Free Prior Informed Consent and Notification and Participation (Social Safeguards1&2). Specifically, please clarify the overview of stakeholders involved and to be considered in order to comply with the requirements of these safeguards

  EJEMPLO - (https://agenda4p.com.ar/2024/11/19/en-el-predio-de-piedras-blancas-se-instalara-una-planta-de-biogas-en-el-marco-de-un-acuerdo-entre-cormecor-y-epec/)
- Definitions of the different types of solid waste disposal methods in Argentina.

Previous meetings pending questions

- Inventories or databases that track the operation of each landfill and data on landfill gas collection and control systems in the jurisdiction.
- Additional information on the impact of CDM or other international standards on common practice in the industry (projects mapped)
- Studies and/or data to confirm that the installation of landfill gas collection and control systems not common practice at landfills in Argentina
- Further information on the laws/regulations applicable to landfills in Argentina (by Province, Municipalities) and the applicable regulatory agencies.
  RESOLUCION 1143 02/ EIA (Decreto 1741/1996)/ Otras
- Information on Occupational Health and Safety laws for landfill sites and the applicable regulatory body/agency.
- Information on the regulatory body that oversees environmental regulations for landfills.
- Emission Factors for Stationary and Mobile Combustion Fuels in Argentina, Net Calorific Values of Fossil Fuels in Argentina, Predetermined Destruction Efficiencies for Combustion Devices. Alternatively, confirm that the use of existing values is appropriate

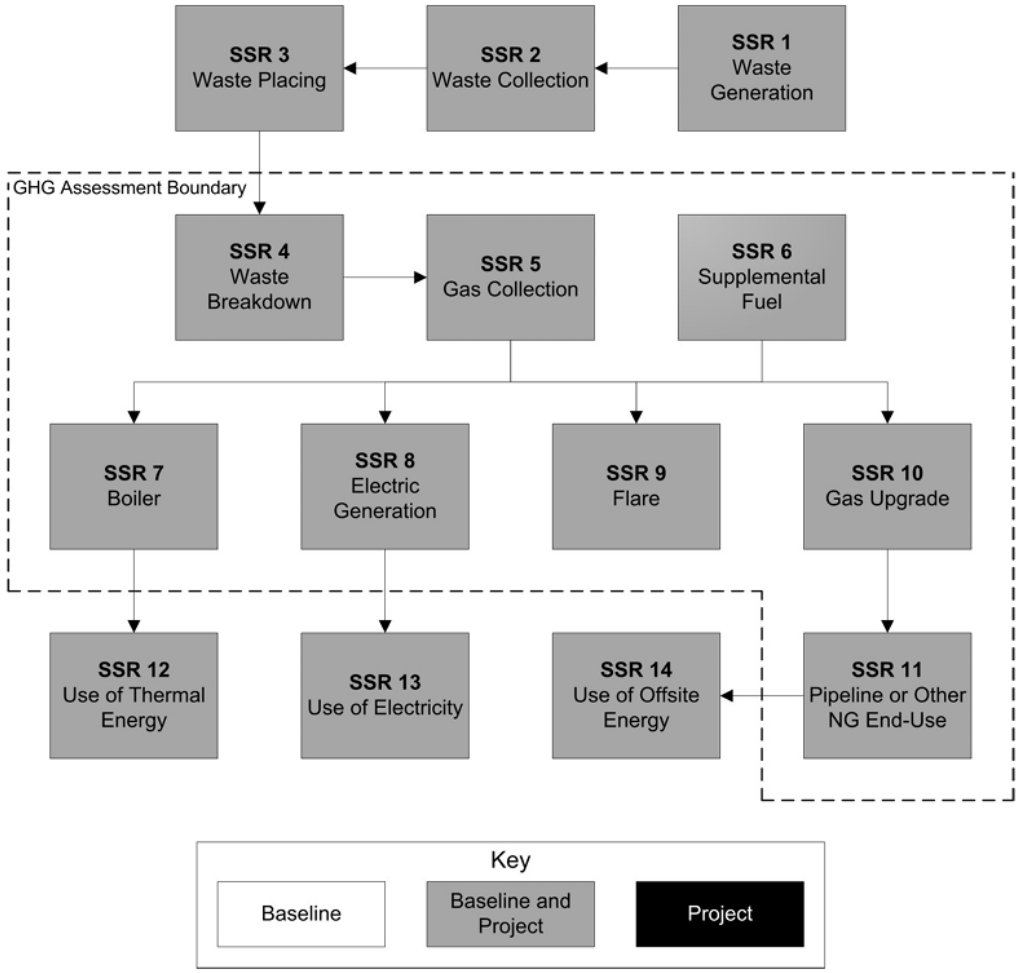
Safeguards MRV

Eligibility Rule	Eligibility Criteria
Social Safeguard 1 - FPIC	Signed documentation demonstrating compliance with social safeguard 1 FPIC. Clarify the overview of stakeholders involved and to be considered in order to comply with the requirements of these safeguards
Social Safeguard 2 - Ongoing Notification, Participation, and Documentation	Signed documentation demonstrating compliance with social safeguard 2 Ongoing Notification, Participation, and Documentation.
Social Safeguard 3 – Labor and Safety	Signed Attestation of Regulatory Compliance form attesting to be in material compliance with all applicable laws, including labor and safety. Verifiers should contact the applicable government agencies.
Social Safeguard 4 – Respect Local Land Tenure Rights & No Conflicts	Signed Attestation of No Conflict attesting that there are no land tenure disputes that affect the project boundary, including all landfill installations directly associated with the carbon project. Verifiers should contact the applicable government agencies.
Environmental Safeguard 1 – Air and Water Quality	Signed Attestation of Regulatory Compliance form attesting to be in material compliance with all applicable laws, including those related to air and water quality. Verifiers should contact the applicable government agencies.
Environmental Safeguard 2 – Mitigation of Pollutants	Historical records and ongoing monitoring and reporting through data logging of physical measurements, online sources, and government data to demonstrate the project was 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 have acquired the appropriate local permits prior to installation to prevent violation of all applicable laws. Verifiers should contact the applicable government agencies.

The GHG Assessment Boundary

- The GHG Assessment Boundary for the project includes all emission sources from the operation of the landfill gas collection system to the ultimate destruction of the landfill gas.
  - Primary gases included: CO2 and CH4
- CO2 emissions associated with the generation and destruction of landfill gas are considered biogenic emissions (as opposed to anthropogenic) and will not be included in the GHG reduction calculation.
- This protocol does not account for CO2 reductions associated with the displacement of fossil-based grid-delivered electricity or natural gas.
- N2O emissions are excluded, baseline and project emissions are assumed to be equal or very small

The GHG Assessment Boundary



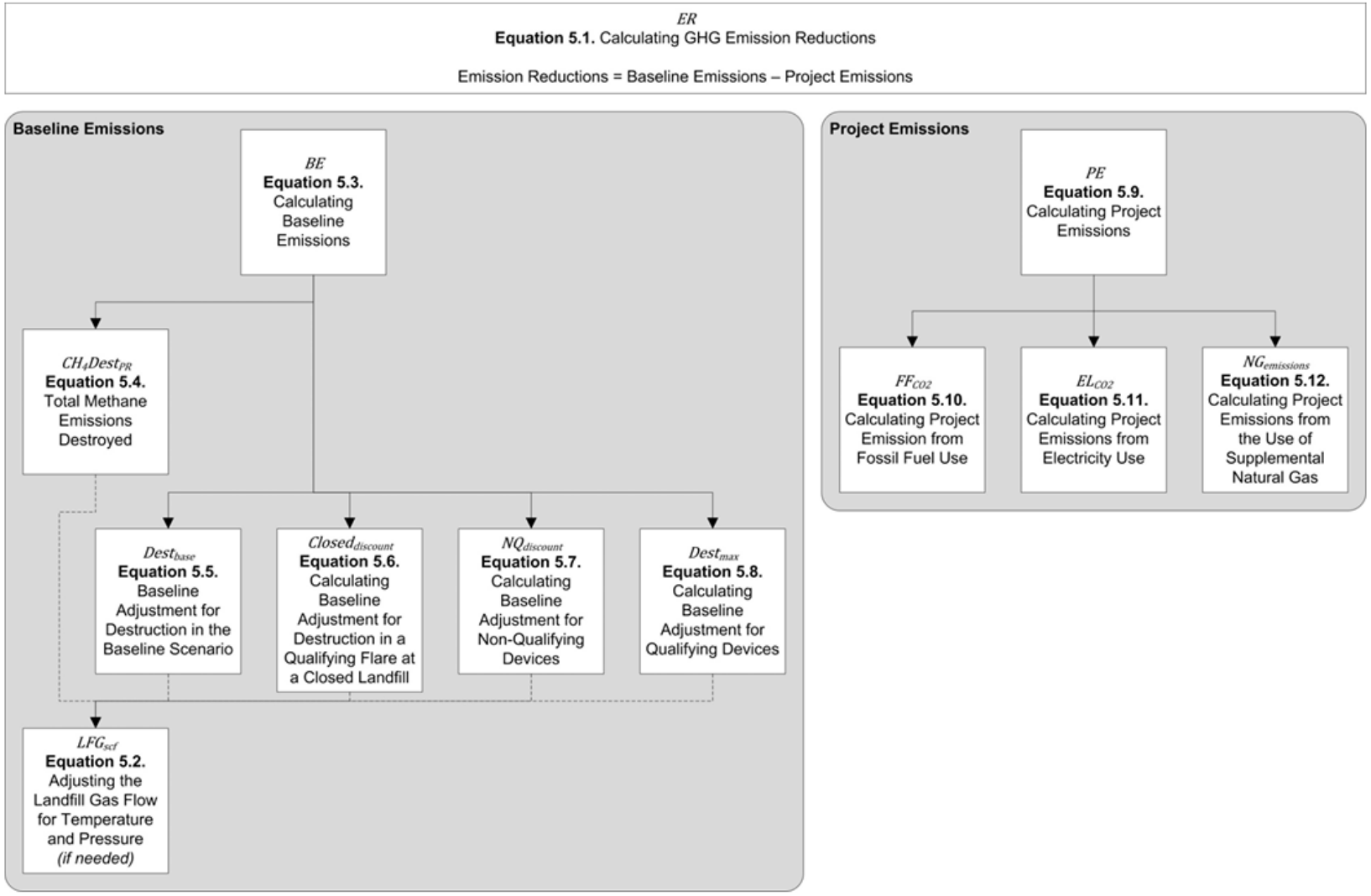
- All SSRs within the dashed line are taken into account in this protocol.
- Not all SSRs will occur in all projects.
- Leakage is not expected with these protocols
- Comments?

Quantifying GHG Emission Reductions

GHG emission reductions from a landfill project are quantified by comparing actual project emissions to baseline emissions at the landfill.

- Baseline emissions are an estimate of the GHG emissions from sources within the GHG Assessment Boundary that would have occurred in the absence of the landfill project.
- Project emissions are actual GHG emissions that occur at sources within the GHG Assessment Boundary. Project emissions must be subtracted from the baseline emissions to quantify the project's total net GHG emission reductions.
- GHG emission reductions must be quantified and verified on at least an annual basis.
  - Project developers may choose to quantify and verify GHG emission reductions on a more frequent basis if they desire.
  - The length of time over which GHG emission reductions are quantified and verified is called the "reporting period."
- Project developers shall use the calculation methods provided in this protocol to determine baseline and project GHG emissions to quantify GHG emission reductions.

Quantifying GHG Emission Reductions



Quantifying Baseline Emissions

- Traditional baseline emission calculations are not required for this protocol for the quantification of methane reductions. The baseline scenario assumes that all uncontrolled methane emissions are released to the atmosphere except for the portion of methane that would be oxidized by bacteria in the soil of uncovered landfills, absent the project.
- Projects can be grouped into different categories depending upon the baseline scenario and take the appropriate deduction.
  - Landfills where no previous destruction took place prior to project implementation
  - Landfills where previous collection and/or destruction took place with a nonqualifying destruction device
  - Landfills where previous collection and destruction took place with a qualifying destruction device
  - Closed landfills where previous collection and destruction took place in a qualifying flare

Quantifying Baseline Emissions

- This protocol accounts for the difference in electricity consumption between the baseline scenario and the project by assuming no electricity consumption in the baseline and deducting the annual indirect CO2 emissions due to the project activity from the annual project emission reductions.
- Any project at a landfill where methane was collected and destroyed at any time prior to the project start date – even if the prior collection and/or destruction system was removed or has been dormant for an extended period of time – must apply the pre-project deduction.

Quantifying Project Emissions

- Certain GHG emissions may occur or increase as a result of the project activity and therefore must be deducted from the overall project reductions. The following categories of emissions must be accounted for under this protocol:
  - Total annual indirect carbon dioxide emissions resulting from consumption of electricity from the grid
  - Total annual carbon dioxide emissions from the on-site destruction of fossil fuel
  - Total annual carbon dioxide emissions from the combustion of supplemental natural gas
  - Total annual methane emissions from the incomplete combustion of supplemental natural gas
- Emissions resulting from incomplete destruction of landfill gas or the fugitive release of landfill gas do not need to be accounted for. It is assumed that these would have been released to the atmosphere in the baseline scenario as well
- Comments?

Monitoring Requirements

Methane emission reductions from landfill gas capture and control systems must be monitored with measurement equipment that directly meters:

- The flow of landfill gas delivered to each destruction device, measured continuously and recorded every 15 minutes or totalized and recorded at least daily, adjusted for temperature and pressure
- The fraction of methane in the landfill gas delivered to the destruction device, measured continuously and recorded every 15 minutes and averaged at least daily (measurements taken at a frequency that is between daily and weekly may be used with the application of a 10% discount). Projects may not be eligible for crediting if methane concentration is not measured and recorded at least weekly.
- The operational activity of the destruction device(s), monitored and documented at least hourly to ensure landfill gas destruction. Alternatively, the presence of a safety shut off valve.

Monitoring Equipment

- Does Argentina have access to the following equipment:
  - Continuous flow meters
  - Continuous methane concentration analyzers
  - Portable instruments to acquire methane data (i.e., handheld methane analyzer)
  - Portable instruments to conduct field checks for calibration accuracy of monitoring equipment
  - Devices that can automatically self-calibrate
  - Pressure transmitters for alternative flow monitoring
  - Meters installed on the wellhead to improve biogas collection efficiency
  - Thermocouples for to confirm operational status of flares

Monitoring Requirements

- If discontinuous CH4 concentration monitoring is to be employed, then the project developer shall develop a prescriptive methodology for how such monitoring is to be carried out.
- Methane fraction of the landfill gas is to be measured on a wet/dry basis, depending on the basis (i.e., measured on the same basis) of measurement for flow, temperature, and pressure
  - Methane and flow meters must be installed in the same location relative to any moisture-removing components and operate on the same basis
  - Allowed variation: flow meter on dry basis and methane on wet basis
- Comments?

Monitoring Requirements

If there are any periods when not all destruction devices measured under a single flow meter are operational, methane destruction during these periods will be eligible provided that the verifier can confirm all the following conditions were met:

1. The destruction device efficiency of the least efficient destruction device in operation shall be used as the destruction efficiency for all destruction devices monitored by this meter;
2. All devices are either equipped with valves on the input gas line that close automatically if the device becomes non-operational (requiring no manual intervention), or designed in such a manner that it is physically impossible for gas to pass through while the device is non-operational;
3. For any period where one or more destruction devices within this arrangement is not operational, it must be documented that the remaining operational devices have the capacity to destroy the maximum gas flow recorded during the period. For devices other than flares, it must be shown that the output corresponds to the flow of gas.

Comments?

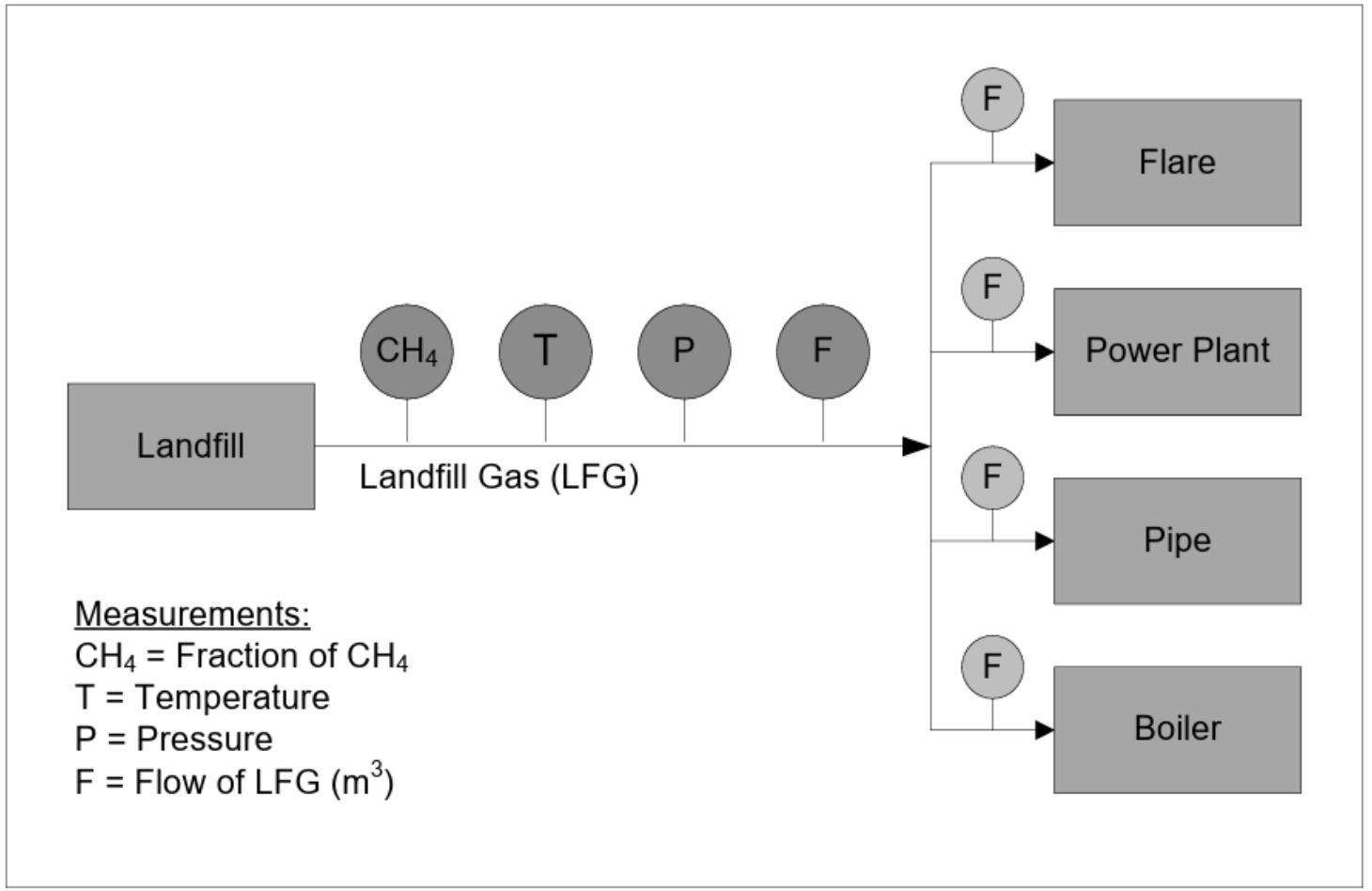
Monitoring Requirements

- All destruction devices must have their operational status monitored and recorded at least hourly. If these data are missing or never recorded for a particular device, that device will be assumed to be not operating and no emission reductions may be claimed for landfill gas destroyed by that device during the period when data are missing.
- All flow data collected must be corrected for temperature and pressure at 0o C and 1 atm, either internally or via Equation 5.2. The temperature and pressure of the landfill gas must be measured continuously.

Direct Use Scenarios

- Direct use: where gas is delivered offsite to a third-party end user (not commercial natural gas transmission/distribution system) must make reasonable effort to obtain operational status of the destruction device(s).
- Alternatively, verifier must confirm to a reasonable level of assurance that there is no release of gas, including:
  - Signed attestation of no catastrophic failure
  - In person inverview with the owner of the destruction device(s)
  - Exam safety features and equipment design
  - Records that corroborate type and level of operation of the destruction device (e.g. engine output data)

Monitoring Requirements



Instrument QA/QC Requirements

- All gas flow-meters and continuous methane analyzers must be:
  - Cleaned and inspected on a regular basis, as specified in the project's monitoring plan, with activities and results documented by site personnel. Cleaning and inspection frequency must, at a minimum, follow the manufacturers' recommendations.
  - Field checked for calibration accuracy by a third-party technician with the percent drift documented, using either a portable instrument (such as a pitot tube) or manufacturer specified guidance, at the end of – but no more than two months prior to or after – the end date of the reporting period
    - Would it be possible to have a third-party technician assessment?
  - Calibrated by the manufacturer or a certified third-party calibration service per manufacturer's guidance or every 5 years when calibration frequency is not specified by the manufacturer.
    - Are there manufacturers or certified services available in Argentina
- All flow meters and methane analyzers should be within a +/-5% threshold for accuracy.

Missing Data

In situations where the flow rate or methane concentration monitoring equipment is missing data, the project developer shall apply the data substitution methodology provided in Appendix C. If for any reason the destruction device monitoring equipment is inoperable (for example, the thermal coupler on the flare), then no emission reductions can be registered for the period of inoperability.

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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 notes summary on 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 February 21st)
  - Look out for information for next meeting's discussion topics
  - Tentative next Workgroup Meeting: March 5th , 11:30-13:30 ARG time – Comments?

Key contacts

Climate Action Reserve:

Protocol development lead:

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THANK YOU!