CLIMATE ACTION RESERVE

Early Plugging of Marginal Oil and Gas Wells Protocol & United States Module V1.0

Public Comment Webinar

October 6, 2026

Introductions

Reserve Staff

Rachel Mooney – Manager, Protocol Development

Jon Remucal – Director, Protocol Development

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 webinar

The slides and a recording of the presentation will be posted online on the protocol webpage

AGENDA

- Introduction to the Climate Action Reserve
- Overview of the new modular approach
- Background
- Overview of the Early Plugging of Marginal Oil and Gas Wells Protocol and Jurisdiction Module: United States
- Q&A
- Next steps

CLIMATE ACTION RESERVE

INTRODUCTION TO THE CLIMATE ACTION RESERVE

CLIMATE ACTION RESERVE

HIGH-INTEGRITY CREDITS FOR GLOBAL CARBON MARKETS

CORSIA

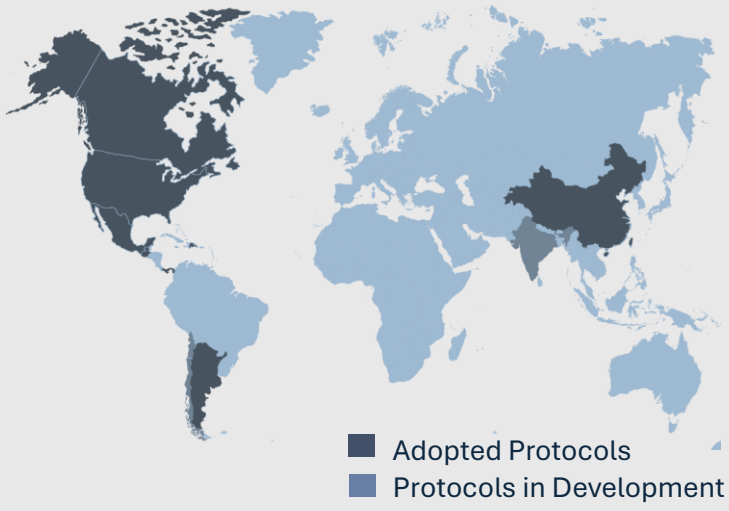
Phase I approval for all methodologies - 3.1M eligible credits.

ICVCM CCP CORE CARBON PRINCIPLES

8 PROTOCOLS CCP-APPROVED

38 m CREDITS CCP-ELIGIBLE

Represents 31% of all CCP labeled credits in the carbon market.



31 PROTOCOLS

260+M CREDITS

1.19k PROJECTS

Nature-Based Solutions

Waste and Methane Destruction

Industrial Processes and Gases

The Climate Action Reserve

EXPERIENCE, INTEGRITY, INNOVATION

Depth of Knowledge & Experience

- Roots in California's compliance program
- 25+ years in compliance and voluntary markets

48 days

World-leading project registration time

Average time from submittal to registration/issuance — a shorter, reliable turnaround for developers to monetize credits.

Pioneering Multi-Stakeholder Support

- Broad engagement with diverse stakeholder groups throughout protocol development and beyond

Trusted by Compliance Programs World-Wide

- US Cap-and-Invest: California & Washington
- Colorado Recovered Methane Rule
- Mexican state carbon taxes: Querétaro, Colima, Tamaulipas
- Chile Carbon Tax
- Singapore Carbon Tax (programmatic approval)
- CORSIA Phase I
- MOUs with governments worldwide

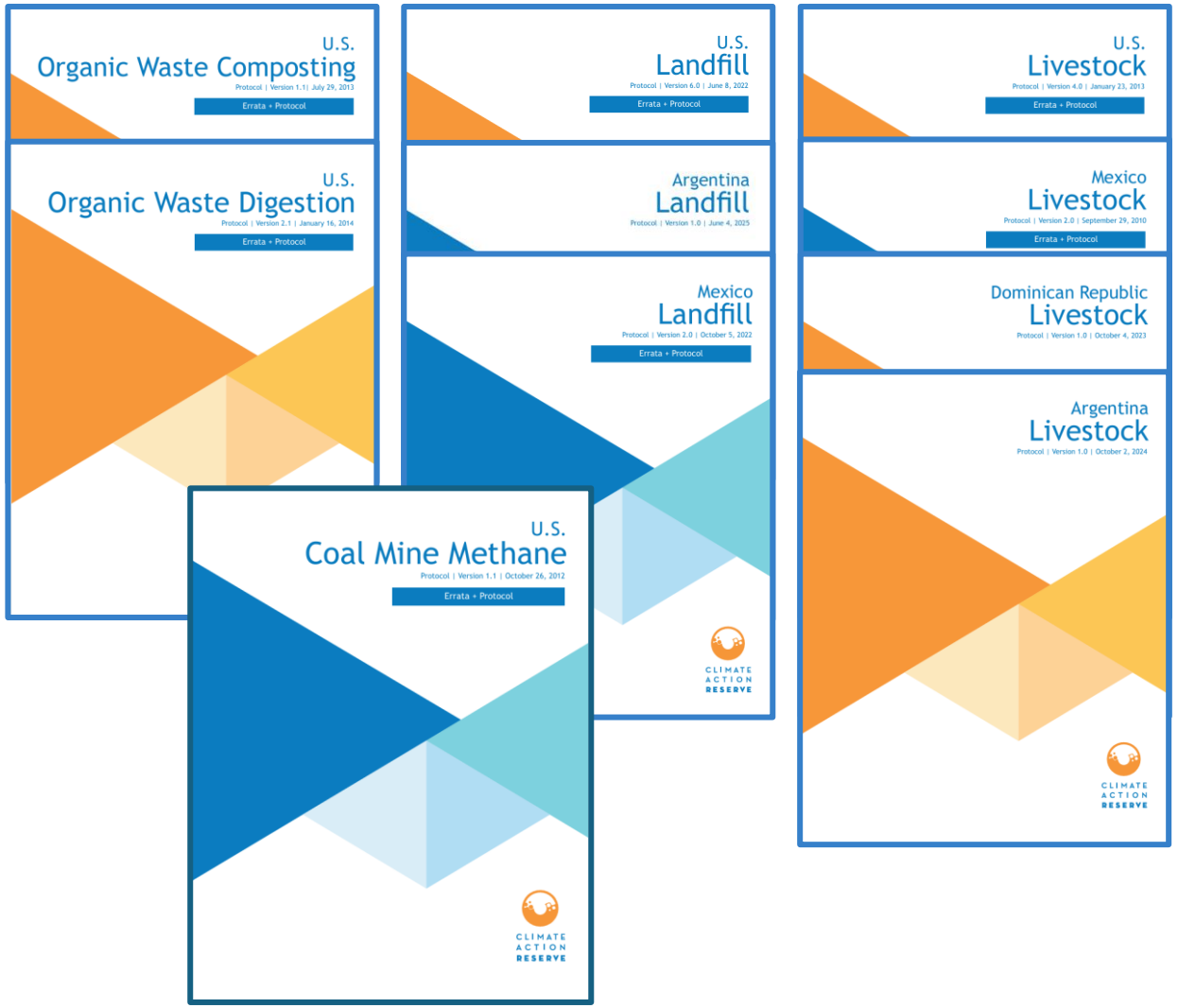
Standardized Protocols for Local Contexts

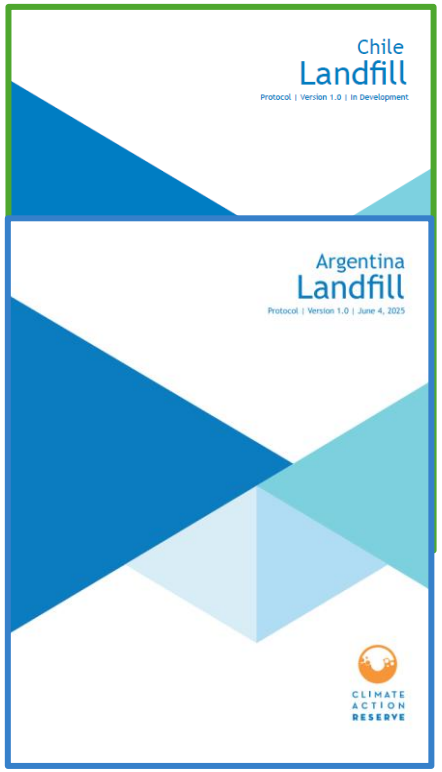
- Reduces project-specific subjective assessments; greater upfront certainty & downstream efficiencies
- Jurisdictional alignment with national climate priorities & legal frameworks reduces policy risk

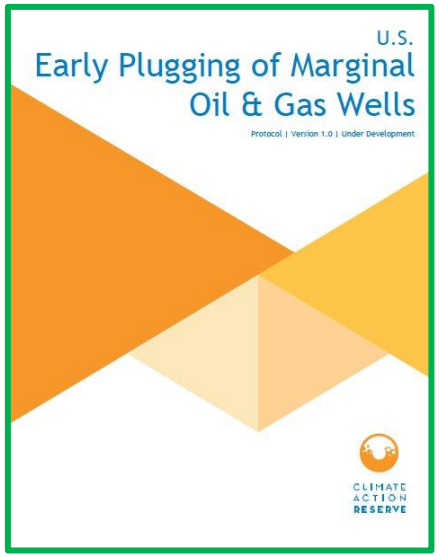
High-Quality Credits You Can Trust

- Conservative accounting methodologies & baseline assumptions protect market confidence
- Robust verification body oversight
- Transparent registry and programmatic processes

Expertise in Methane







Key:
Existing protocols
Protocols open for comment

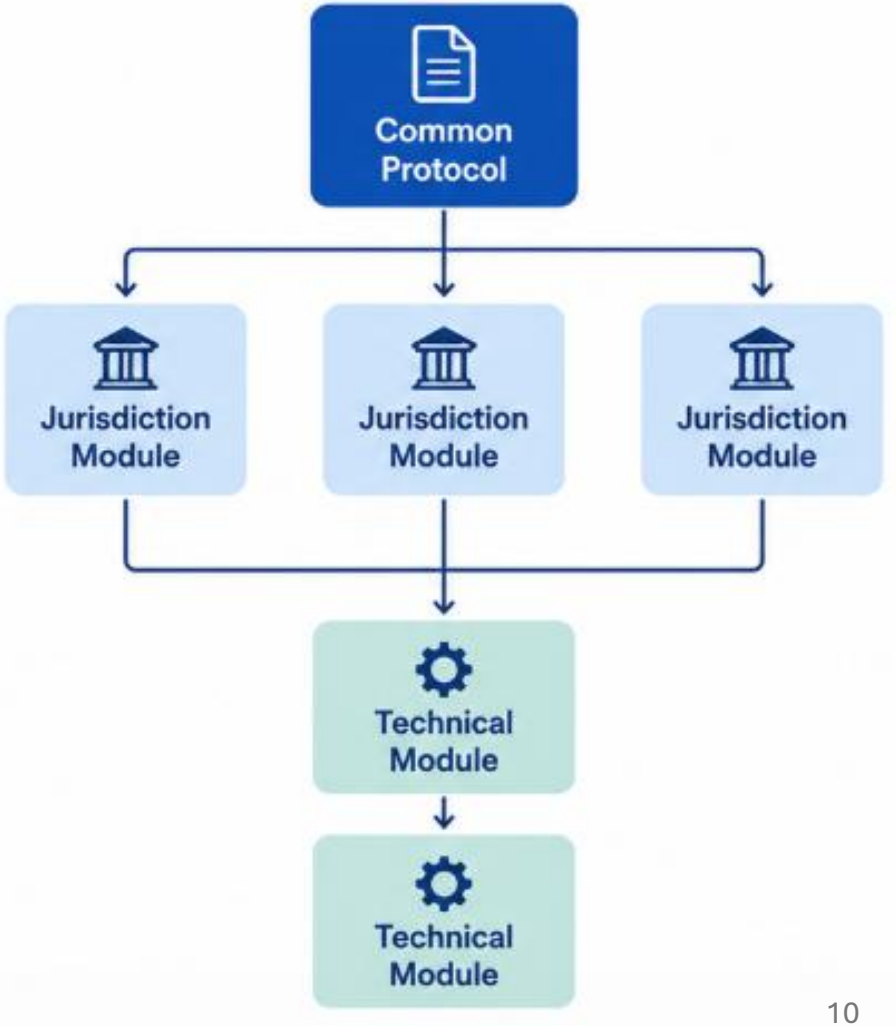
OVERVIEW OF THE NEW MODULAR APPROACH

Scaling Impact: Modular Approach to Protocol Development

The Modular Protocol Structure includes 3 components:

1. Common Protocol
2. Jurisdiction Module
3. Technical Guidance Module

Primarily a restructure, reformatting of information, not a change in requirements



Scaling Impact: Modular Approach to Protocol Development

How the Modular Approach Works

Consistent Core Requirements

Core quantification and eligibility criteria remain uniform across all jurisdictions to ensure integrity.

Adoption Within Months

Modularization enables the launch of protocols in new jurisdictions in just a few months.

Targeted Local Customization

Assessments focus exclusively on key local considerations rather than reinventing the entire protocol.

Strategic Value for Stakeholders

Reduced Operational Costs

Lower transaction costs for developers operating across multiple countries in the region.

Faster Market Readiness

Accelerates the availability of high-integrity credits for governments and regional buyers.

Scalable Regional Growth

Enables rapid expansion into emerging jurisdictions without compromising environmental integrity.

CLIMATE ACTION RESERVE

BACKGROUND

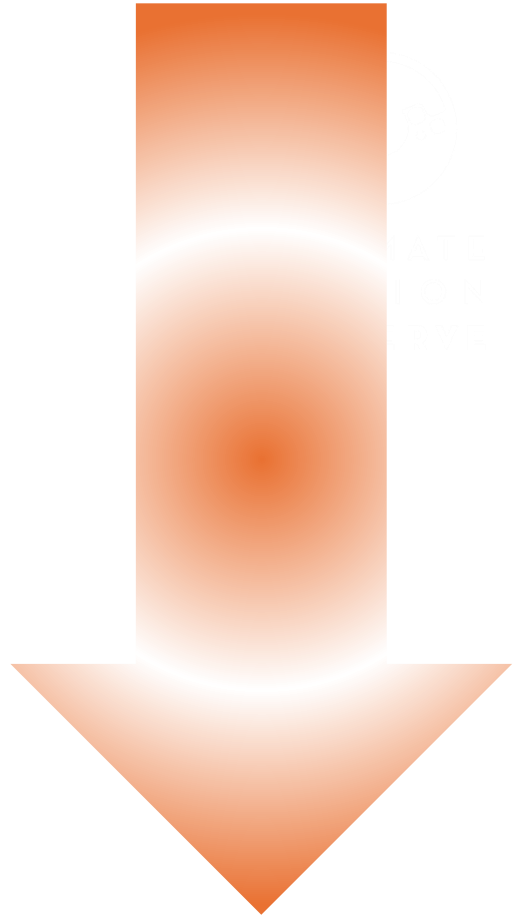
Protocol development process & timeline

1. Scoping Webinar (*November 25, 2025*)

2. Workgroup Process
   - Formation (*December 2025*)
   - Meeting 1 (*January 2026*)
   - Meeting 2 (*January 2026*)
   - Meeting 3 (*February 2026*)
   - Meeting 4 (*March 2026*)
   - Meeting 5 (*March 2026*)

3. Public Comment Period (*September – October 2026*)

4. Present to Board for adoption (anticipated *November 2026*)



Workgroup Members

The technical support was provided by ClimateWells in collaboration with the Rocky Mountain Institute, EcoEngineers, and Netherland, Sewell & Associates.

Developed in consultation with an expert workgroup

A-Gas Inc*	First Environment, Inc.
ALL Consulting	Franklin Well Services, LLC
California Resources Corporation	PermCap-GHG LLC
Carbon Containment Lab	Seneker & Associates, LLC
ClimateWells	SES Inc
EcoEngineers	TUV SUD America Inc.
Environmental Defense Fund	ZeroWells

* Member formerly with Avondale Private Capital at workgroup initiation

Background

Of the 918,400 productive wells in the US (2024):

80%
of wells are marginal (≤15 BOE/day)

6%
of domestic supply

50%
of the sector's emissions

Methane emissions come from five main sources, resulting in ~ 23 tCH4/year or ~640 tCO2e/year on average

storage tank flashing

working and breathing losses

gas-driven pneumatic controllers

liquids unloading events

seepage from old wellhead and casing equipment

Voluntary decommissioning is not common while wells remain economically viable

Development Process

EARLY PLUGGING OF MARGINAL OIL AND GAS WELLS PROTOCOL AND UNITED STATES MODULE

THE GHG REDUCTION PROJECT

Project Definition

Avoidance of methane leaks during the production and extraction of hydrocarbons from a marginal oil and gas well by decommissioning and plugging the well before it reaches its economic limit

Multiple wells may report as a single project (i.e., one CAR ID) if:

- Same owner/operator
- Located within the same geological reservoir
- Same entity has ownership of all emission reductions
- All wells meet eligibility requirements individually

Project expansion is not permitted after completing initial verification

Project Definition

United States: Marginal wells are defined as

1. A vertically drilled or slightly deviated oil or natural gas well with a known owner/operator;
2. Produces an average of ≤15 barrels of oil equivalent (BOE) per day and/or ≤90,000 cubic feet (Mcf) of natural gas per day over the 12-months prior to the project start date (date the well is plugged);
3. Actively producing/extracting oil and/or gas in at least 7 of the previous 12 months preceding the project start date; and
4. Plugged and abandoned according to federal, state, and/or tribal regulations

Wells producing up to 75 BOE/day may be included in project as long as they:

- Share the same equipment as marginal project wells
- Produce <10% of the total baseline BOE across all project wells
- Only include emission reductions associated with well after production would be ≤15 BOE

The Project Developer

- Default ownership assigned to the well owner/operator
- Project developer must have clear and explicit ownership of the hydrocarbons through a valid contract with the applicable parties (e.g., mineral estate)
- Ownership must be demonstrated as of project start date and duration of economic life of the well and all economic reserves
- Well owner/operator may hire a third-party project developer to complete all reporting and verification.
  - Transfer of ownership must be provided during verification
- Must sign Attestation of Title during each verification

ELIGIBILITY RULES

Location

Projects located at oil and gas wells in approved countries with a Jurisdiction Module are eligible

United States:

- Public
- Private
- Tribal lands
- Territories

Project Start Date and Crediting Period

Start Date: Date well is certified as P&A by official government agency documentation

- **United States:** Bureau of Land Management (public lands), state regulations (private lands), and/or tribal requirements

Crediting Period: Maximum of 10 years following the project start date

- May be less than 10 years to account for shorter economic life
- May be renewed once, for a total lifespan of 20 years. must meet eligibility criteria of most recent protocol and module
- If economic life exceeds 20 years, only 20 years is eligible for crediting

Climate Reserve Tonnes (CRTs) will not be issued if, at any point in the future, the early plugging of marginal oil and gas wells becomes legally required.

Additionality

Projects must yield a surplus of GHG emission reductions that are additional to what would have occurred in absence of the carbon market

Legal Requirements Test	GHG reductions would not otherwise have occurred due to national, state, or local regulations, or legally binding mandates - Sign and submit Attestation of Voluntary Implementation
Performance Standard Test	Standard of performance applicable to all marginal oil and gas well projects 1. Determination of Economic Reserves 2. Determination of Economic Limit
Financial Incentives	1. Credit stacking 2. Payment stacking 3. Real Estate Value

The Performance Standard Test

Establish a performance threshold applicable to all projects based on national, regional, and state level assessment of common practice

P&A typically does not occur until wells are completely uneconomic or regulators compel action

Project developer must demonstrate the well(s) remains economically viable as of the project start date and for a period in the future

- Determination of Economic Reserves
- Determination of Economic Limit

Determination of Economic Reserves

Purpose: Demonstrates the quantity of reserves that would be produced on an economically viable basis in the baseline scenario.

Proved Reserves ("P1"): quantities that can be estimated with a reasonable certainty (at least 90% probability) to be commercially recoverable from known reservoirs and under defined technical and commercial conditions

- Excludes enhanced recovery methods (e.g., water flooding and injection)

Third-party Professional Petroleum Engineering Firm (PPEF) determines the Proved Reserves ("P1") through well-specific assessment

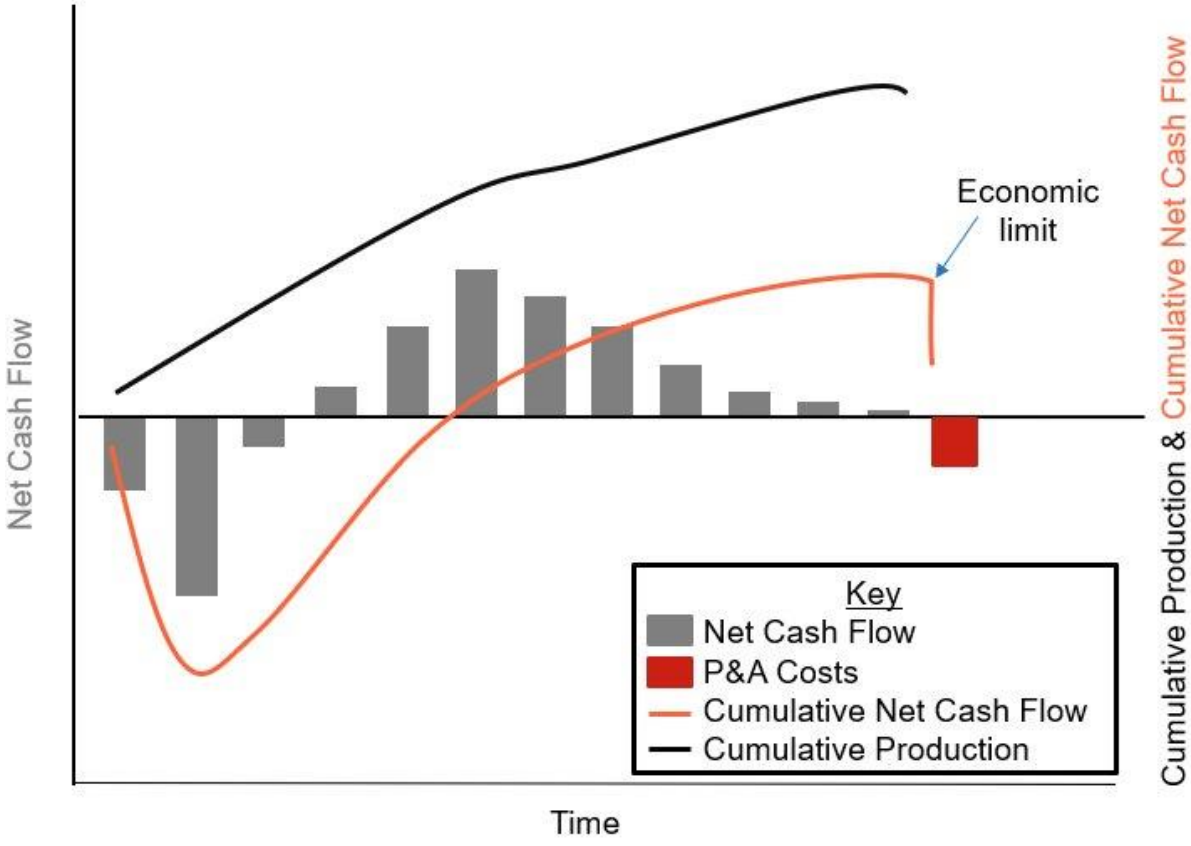
- Use industry standard: Petroleum Resource Management System and Application Guidelines for the Petroleum Resource Management System
- No earlier than 12 months prior to the project start date

Determination of Economic Limit

Purpose: Demonstrate the well remains economically viable as of the project start date and will continue to be economic for a period into the future

PPEF must determine the economic limit, i.e., production rate when the project reaches the maximum cumulative net operating cash flow

Economic limit re-assessed using market conditions at the time of crediting period renewal



Determination of Economic Limit

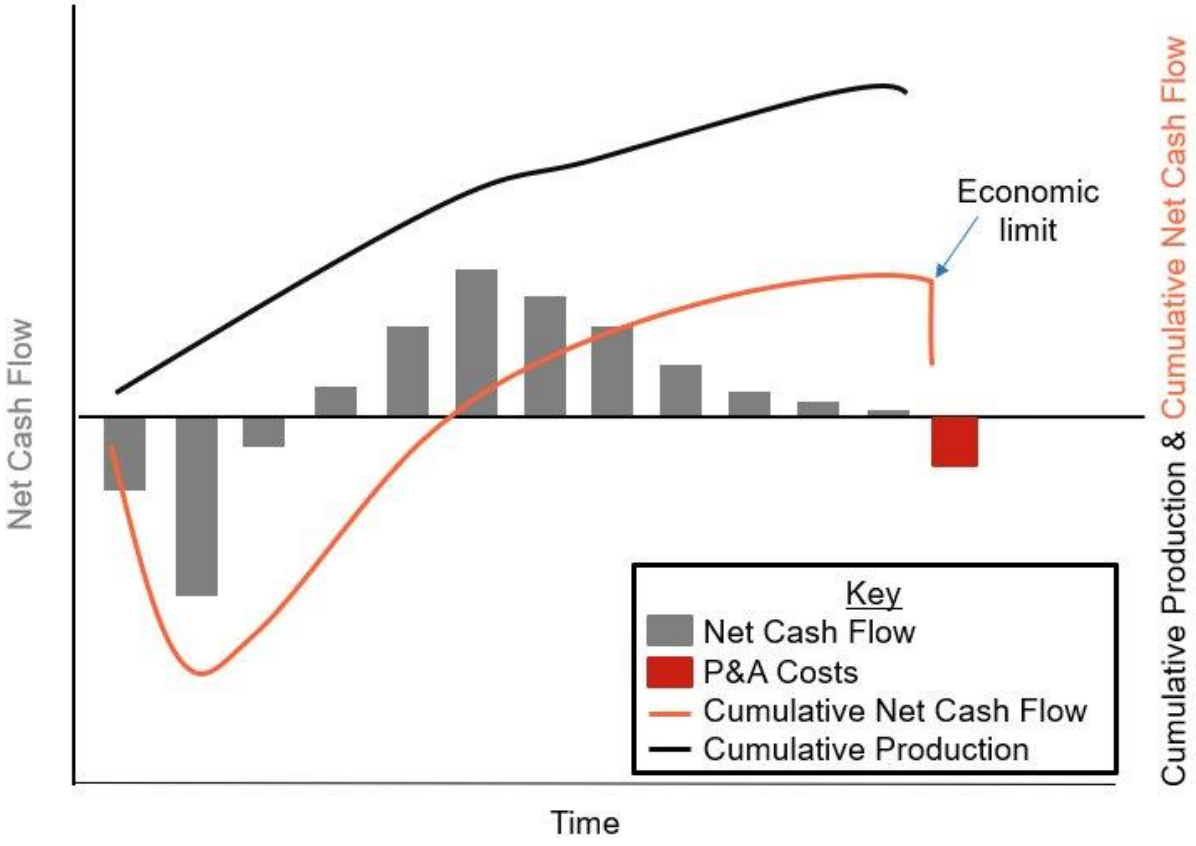
United States

Estimated revenue is based on:

- Most recent U.S. Energy Information Agency Energy Annual Outlook reference prices for oil and/or natural gas
- Year-by-year basis, forecasted through economic limit

Net operating cash flow includes:

- 12 months historic production records
- Must be typical for industry and similar wells



Professional Petroleum Engineering Firm Eligibility

Must demonstrate that the Professional Petroleum Engineering Firm (PPEF) has a low conflict of interest with all parties involved in the project (i.e., owner, operator, material interest, technical consultant, project developer)

- Professional Petroleum Engineering Firm Qualifications and Conflict of Interest Assessment form during verification
- Refer to requirements in Appendix A

All services provided must be conducted by qualified Petroleum Engineer and qualified Petroleum Geologist

- Certified within the state in which the project is located
- Reports must be signed by designated Petroleum Engineer and Petroleum Geologist

Other Incentives

Credit Stacking

- Receiving both carbon credits and other types of mitigation credits for the same activity on spatially overlapping areas associated with any phase of a marginal well project
- **United States:** *None identified during development*

Payment Stacking

- Receiving payments for decommissioning and plugging a marginal well while being funded by the government or other parties via grants, subsidies, payments, etc.
- **United States:** Federal or state grant programs to plug marginal wells, e.g., Methane Emissions Reduction Program (MERP)

Real Estate Value

- Decommission and plug a well based on potential resale value of the land
- **United States:** *Risk deemed low due to cost of P&A exceeding potential resale value of land or increasing nearby property value*

United States: Limitations on Burdening Mineral Rights

Surface rights and mineral rights are typically legally separated, and considered distinct sets of rights, with mineral rights taking precedence

- Well owner/operator establishes contracts with these parties to extract hydrocarbons
- States protect their rights by prohibiting entities from retiring, extinguishing, restricting, or otherwise burdening mineral interests of another

Project developer must provide/demonstrate:

1. Lease and relevant amendments that govern rights and obligations, cessation of production or savings provisions, minimum thresholds (e.g., royalties, production, continuations), notifications
2. Compliance with all lease requirements
3. Evaluation of implied covenant or prudent-operator obligations
4. Operator basis for early decommissioning (e.g., economic, operational, environmental, regulatory)
5. Well Plugging Indemnity Form signed by well owner/operator

Regulatory Compliance and Safeguards

Regulatory Compliance

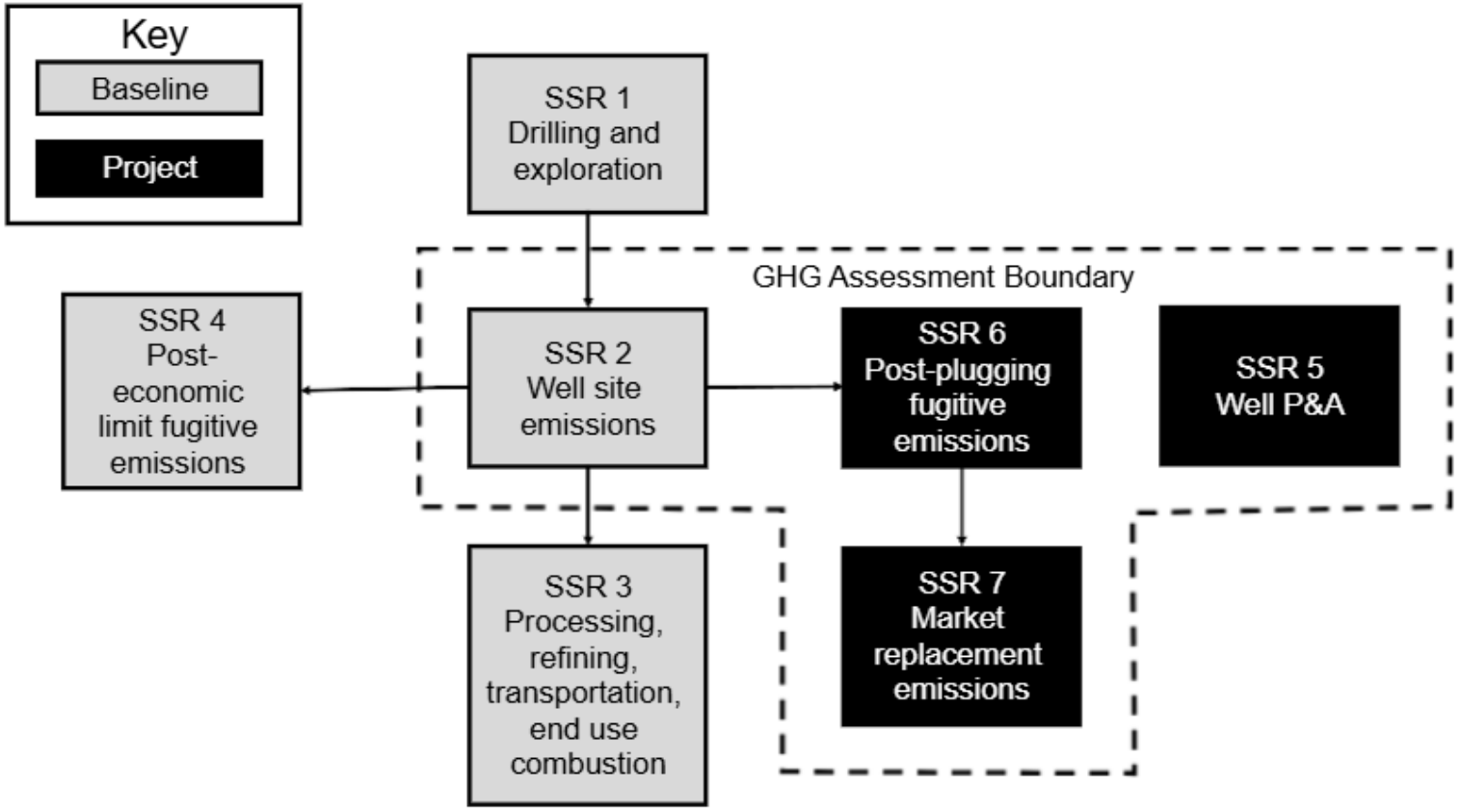
- Must be in compliance with all applicable laws and regulations (air, water, labor)
- Sign and submit Attestation of Regulatory Compliance

Social and Environmental Safeguards

- Notify all parties of P&A as required by law, permits, contracts, etc.
- In material compliance with labor and safety laws
- Complete 30-day public comment period for listed projects
- Material compliance with air and water quality and groundwater testing regulations
- Designed and implemented to mitigate potential releases of pollutants
- Plugged with surface remediation, if applicable

QUANTIFICATION

The GHG Assessment Boundary



Quantification

$$ER_{initial} = BE - PE - ML - D_{R\text{-}NR}$$

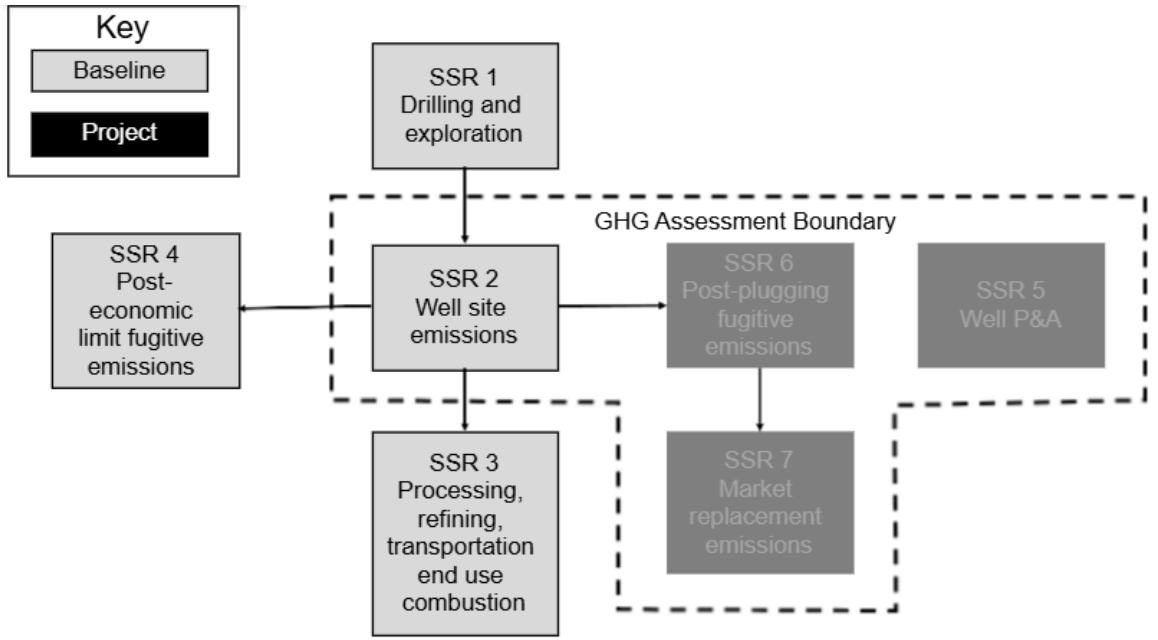
Baseline Emissions (BE)	Emissions that the site would have released while producing remaining economic reserves
Project Emissions (PE)	Emissions associated with plugging and abandonment
Market Leakage (ML)	Assumes reserves are produced by market at a lower methane loss rate
Deduction for Risk of Recovery / Non-Recovery Events ($D_{R\text{-}NR}$)	Deduction for the risk of new wells, re-entry, recompletions, enhanced recovery, regulatory change, and plug failure

Baseline Emissions

Methane that the site would have released while producing its remaining economic reserves

Calculated based on:

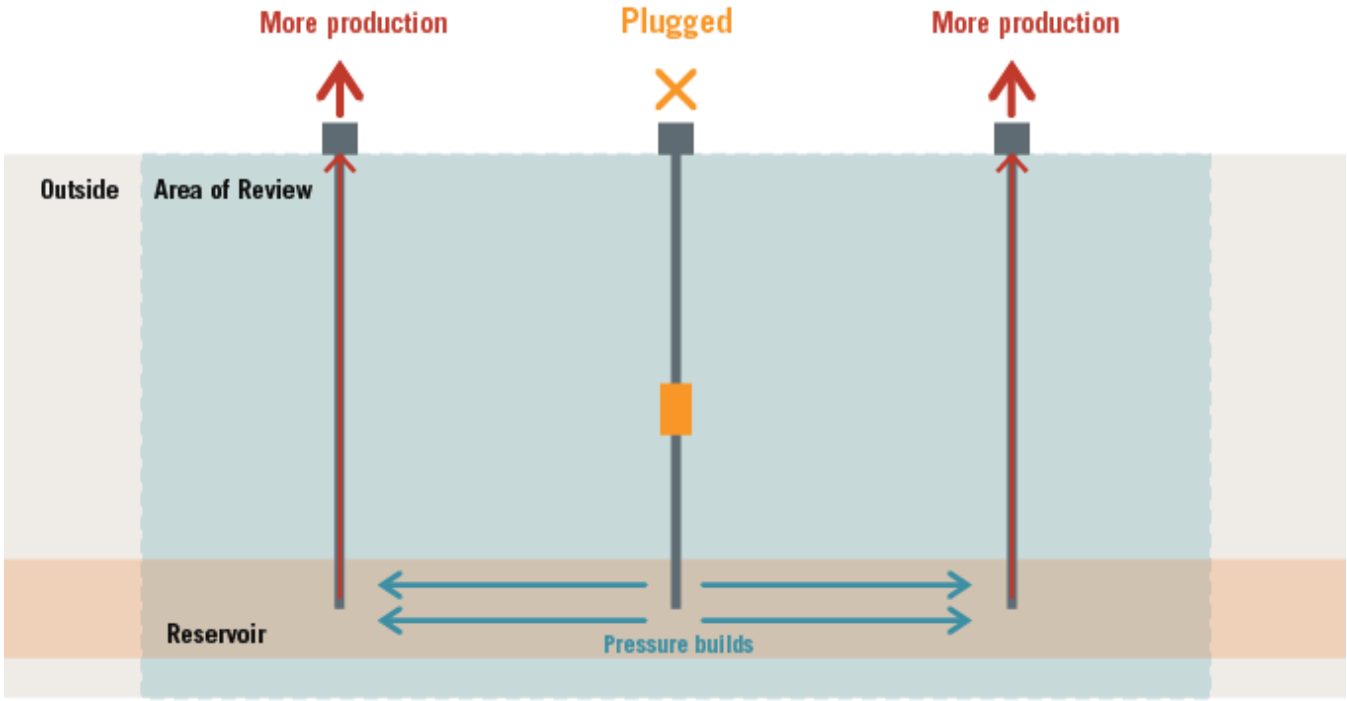
- Volume of economic reserves, adjusted for reservoir communication
- Methane mole fraction of produced gas
- Methane loss rate
  - **United States:** 5-16%, based on project location



Reservoir Communication

Deduction to account for the risk of the release of sequestered methane by existing nearby wells resulting from the movement of oil and gas reserves

PPEF determines the reserves accessible by wells within the Area of Review in the baseline and project scenarios



Protocol conservatively assumes 100% of possible reserves accessible via reservoir communication will be produced, and the difference between baseline and project is deducted from economic reserves being credited

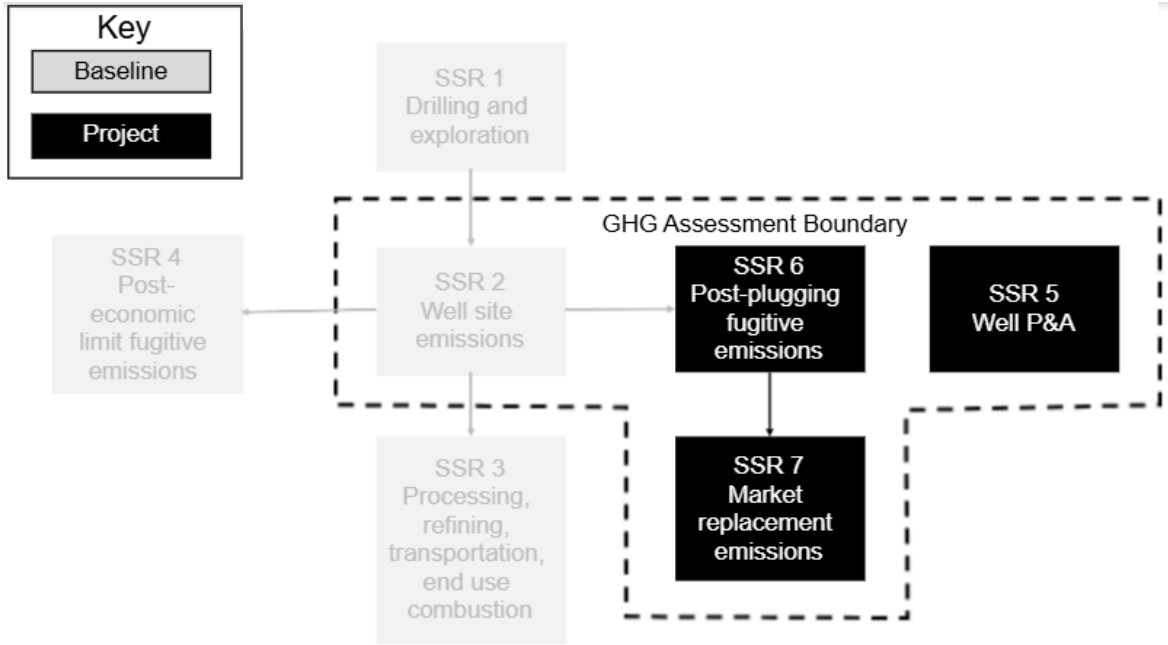
Project Emissions

Actual emissions from the plugging and reclamation operations

- Fossil fuel emissions, embodied cement emissions, transportation

Default or site-specific approach may be selected by project developer

United States: default equal to 50 tCO_2e



Market Leakage

Risk that emission reductions achieved by the project are offset by an increase in emissions outside of the project boundary

Replacement supply of oil and/or natural gas is likely drawn from high-volume production wells with lower methane loss rates

Market leakage rate is quantified based on:

1. Net market replacement share (**United States:** 57%)
2. Well site methane loss rate of replacement natural gas supply (**United States:** 2.3%)
3. Associated gas methane intensity of replacement oil supply (**United States:** 9.1%)
4. Project well methane loss rate (**United States:** 5-16%)

Recovery/Non-Recovery Risk Deduction

Accounts for the risk of new wells, re-entry, recompletions, enhanced recovery, regulatory change, and plug failure

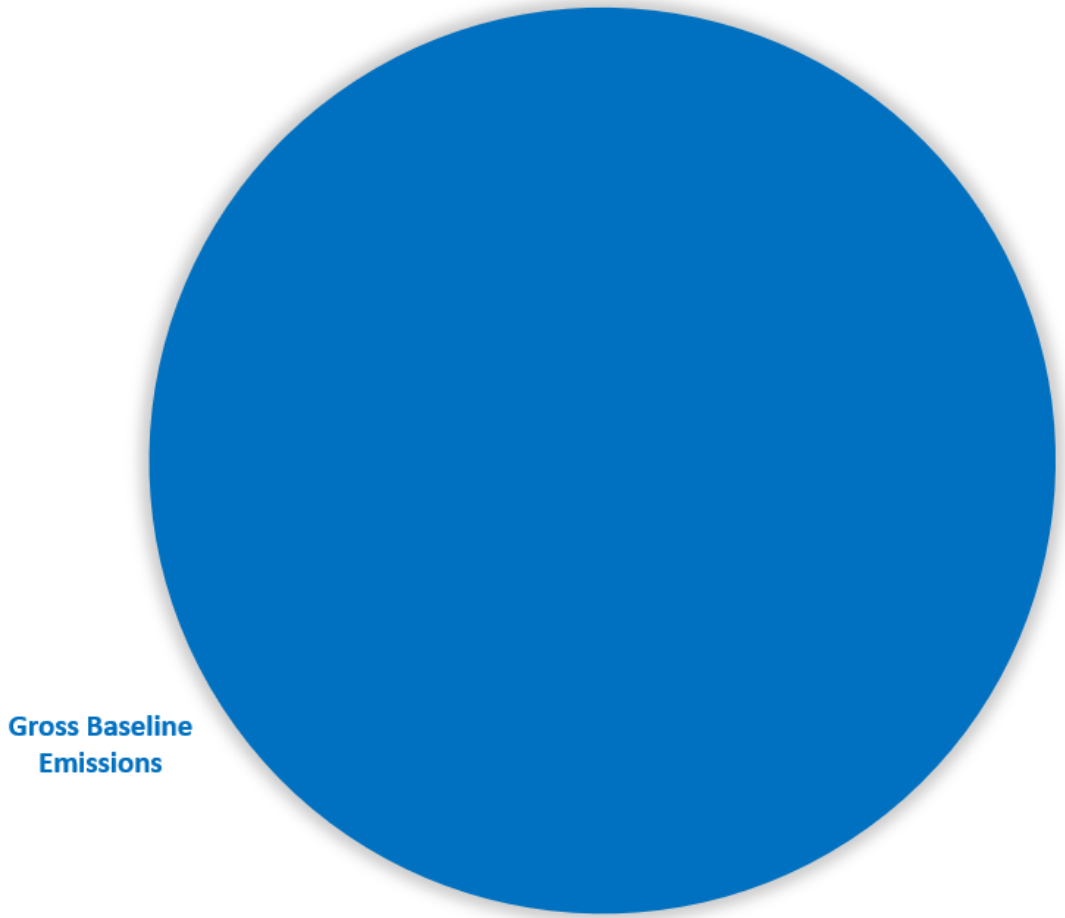
Protocol takes the following approach:

- assumes worst-case scenario of new well completion immediately after P&A
- risk percentage is calculated based on the ratio of methane loss rate at a new well to loss rate of the project well
- additional 5% for conservativeness
- applied to the net baseline emissions and deducted from emission reductions

CRTs may be issued each reporting period thereafter if ongoing monitoring does not identify recovery or non-recovery events

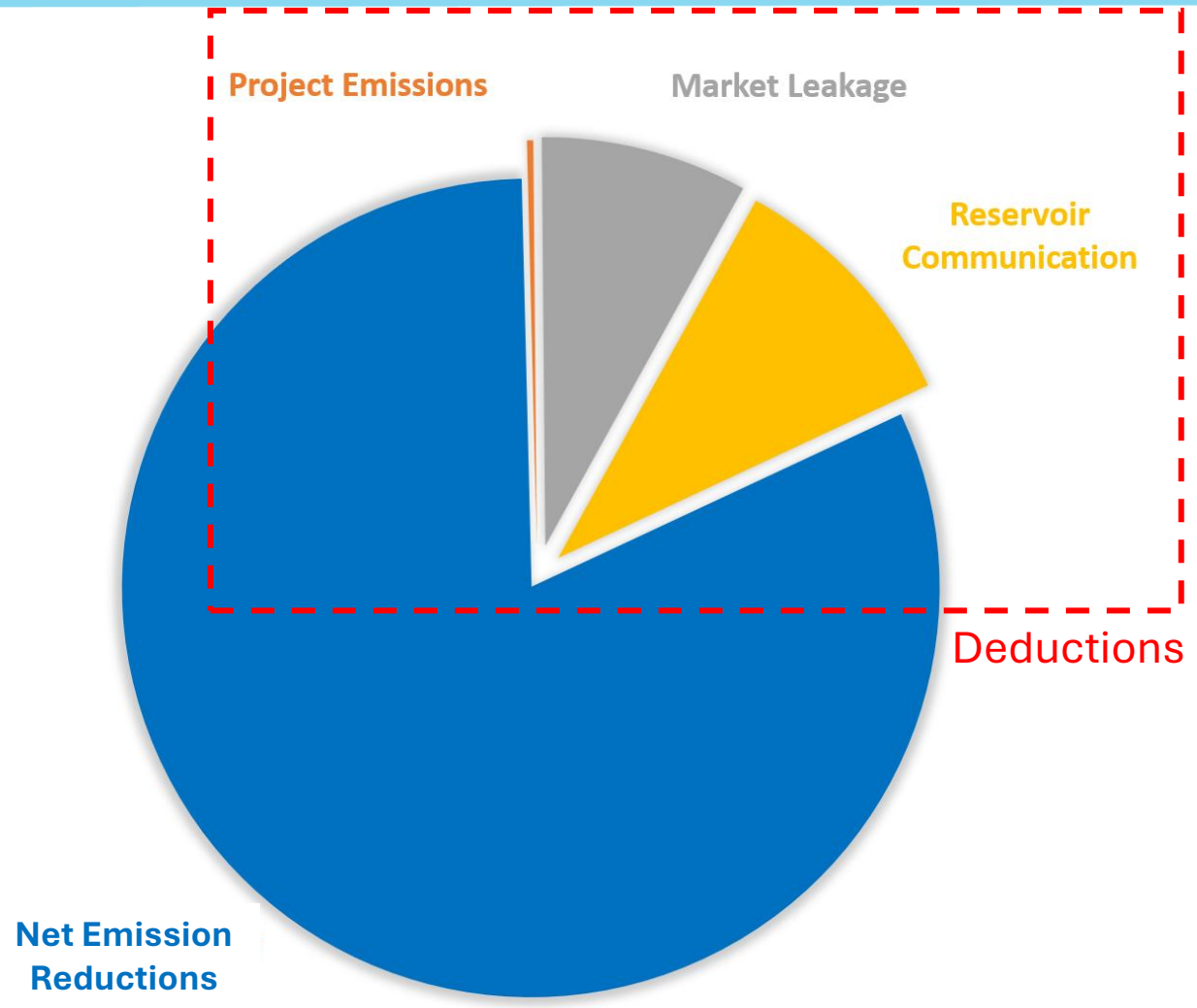
If event does occur, no credits will be issued for reporting period and subsequent reporting periods remaining in the crediting period

Credit Issuance Schedule

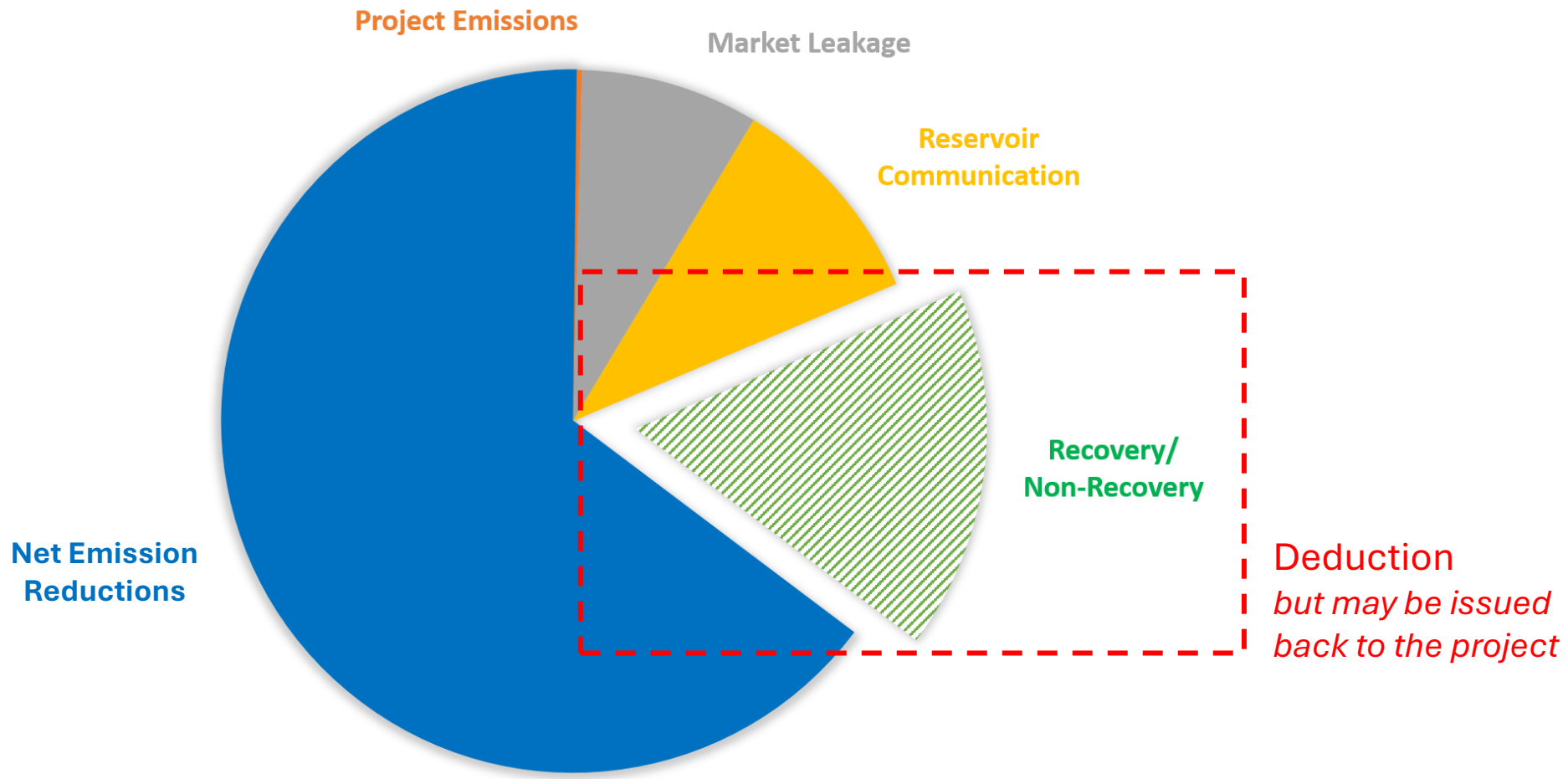


Gross baseline emissions represent the methane emissions during the economic life of the well, prior to deductions

Credit Issuance Schedule

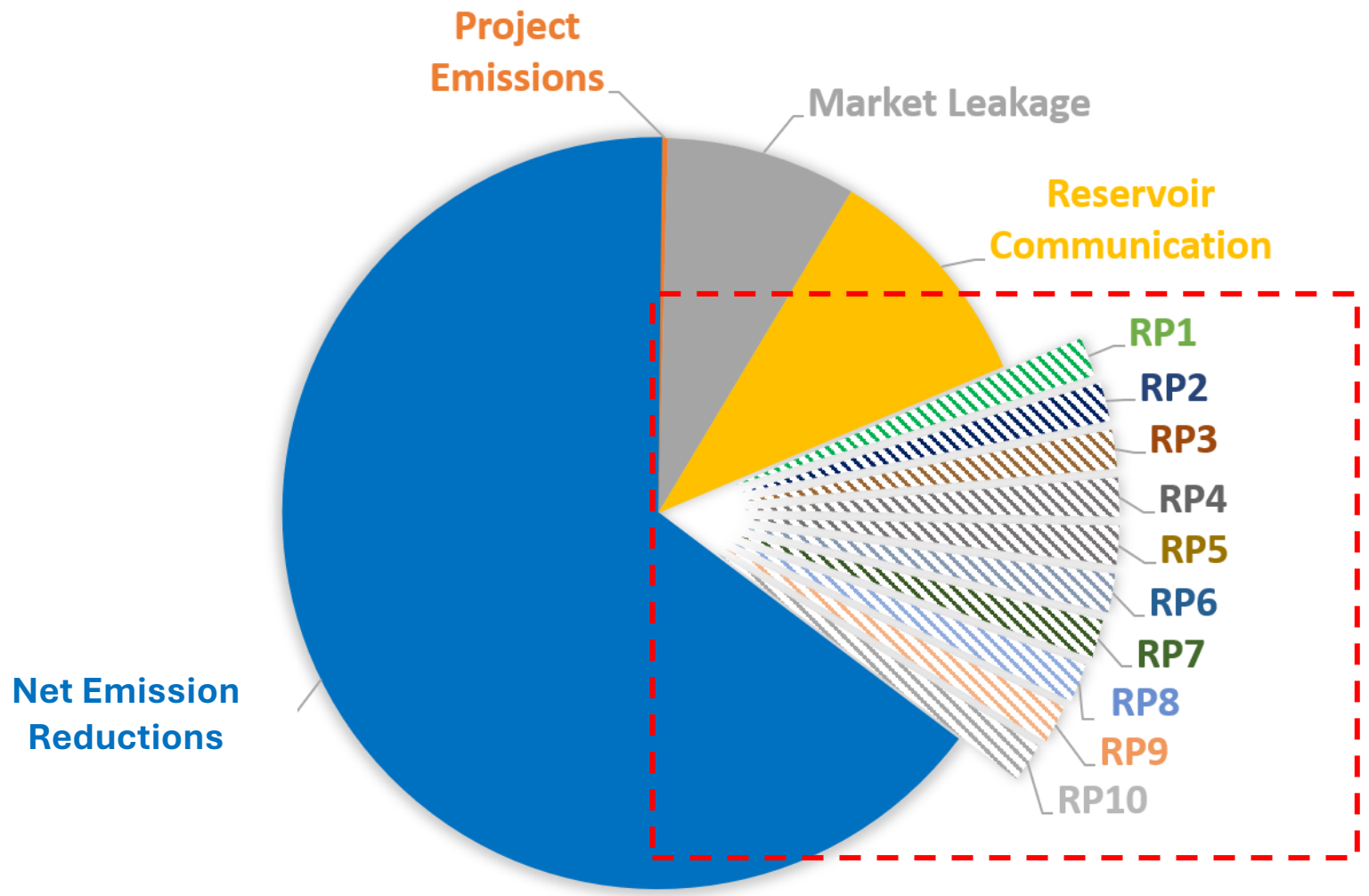


Credit Issuance Schedule



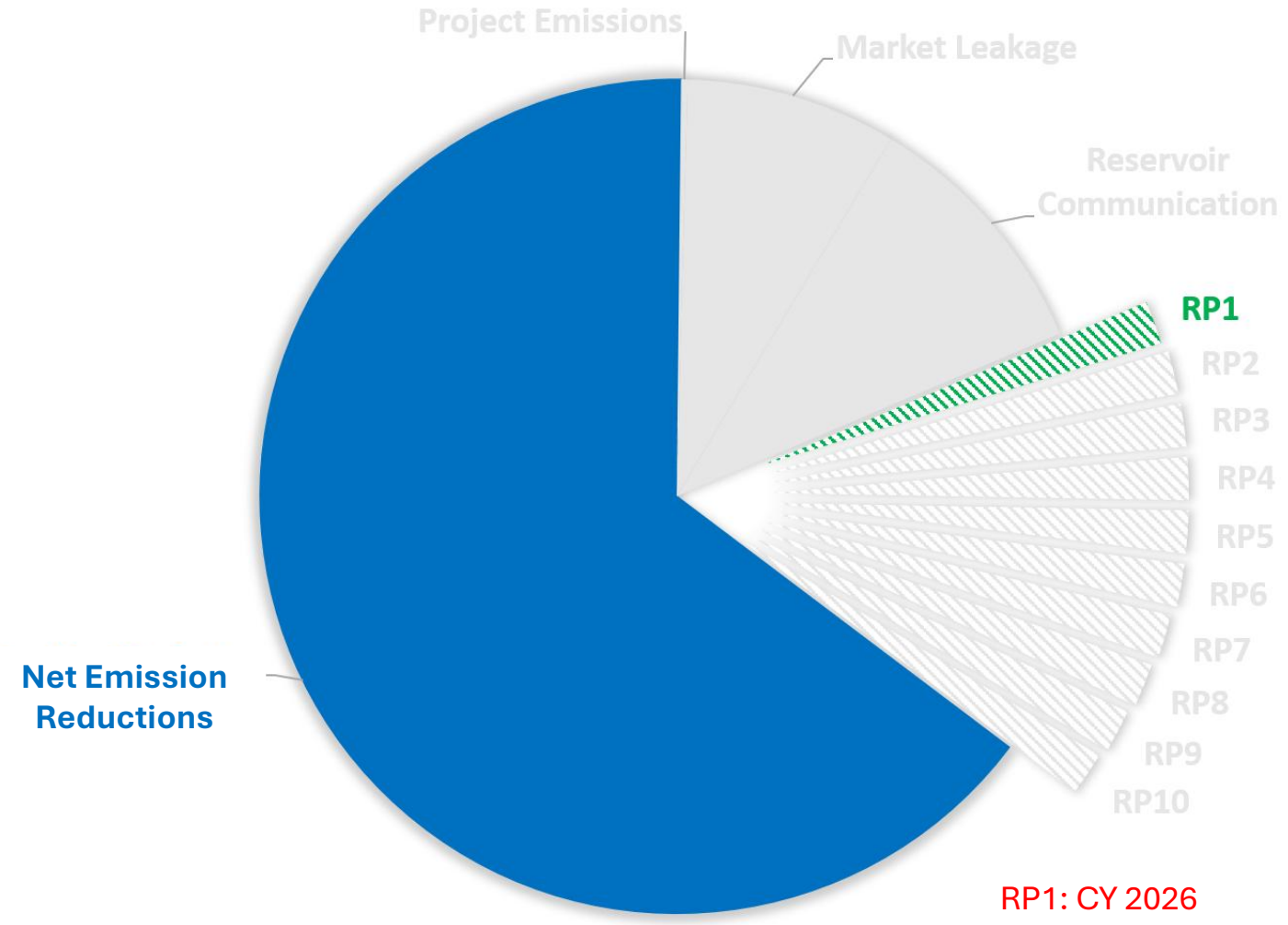
Most—but not all—credits issued in the initial verification period for emissions avoided across the crediting period and the initial reporting period

Credit Issuance Schedule



CRTs may be issued each reporting period thereafter if ongoing monitoring does not identify recovery or non-recovery events

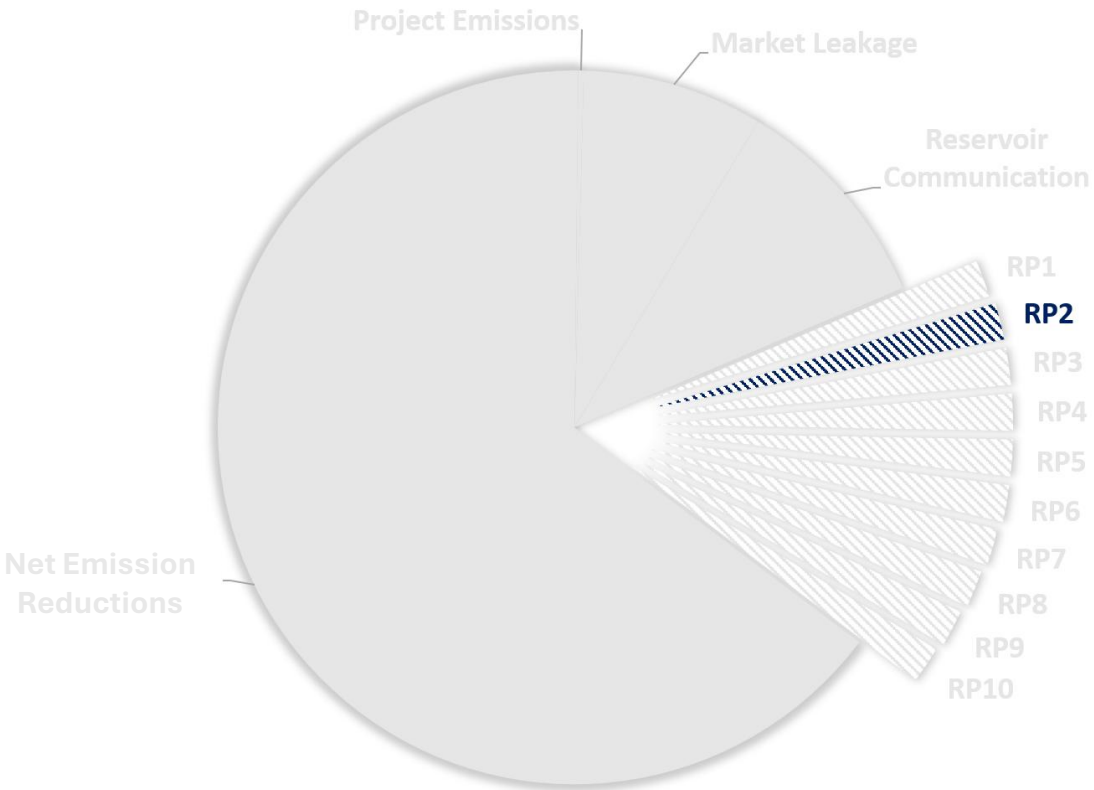
Initial Verification



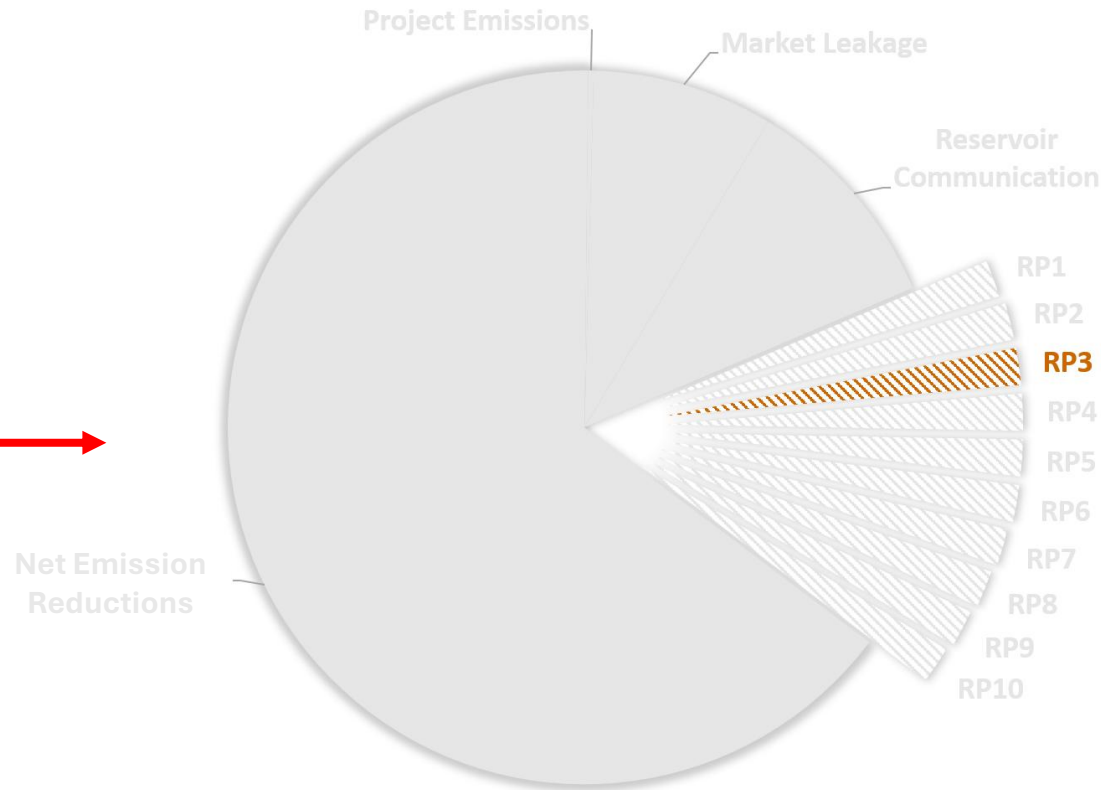
RP1: CY 2026

Initial verification issues net emission reductions (minus all deductions) plus RP1 if no recovery/non-recovery event is identified

Subsequent Verifications - Annual



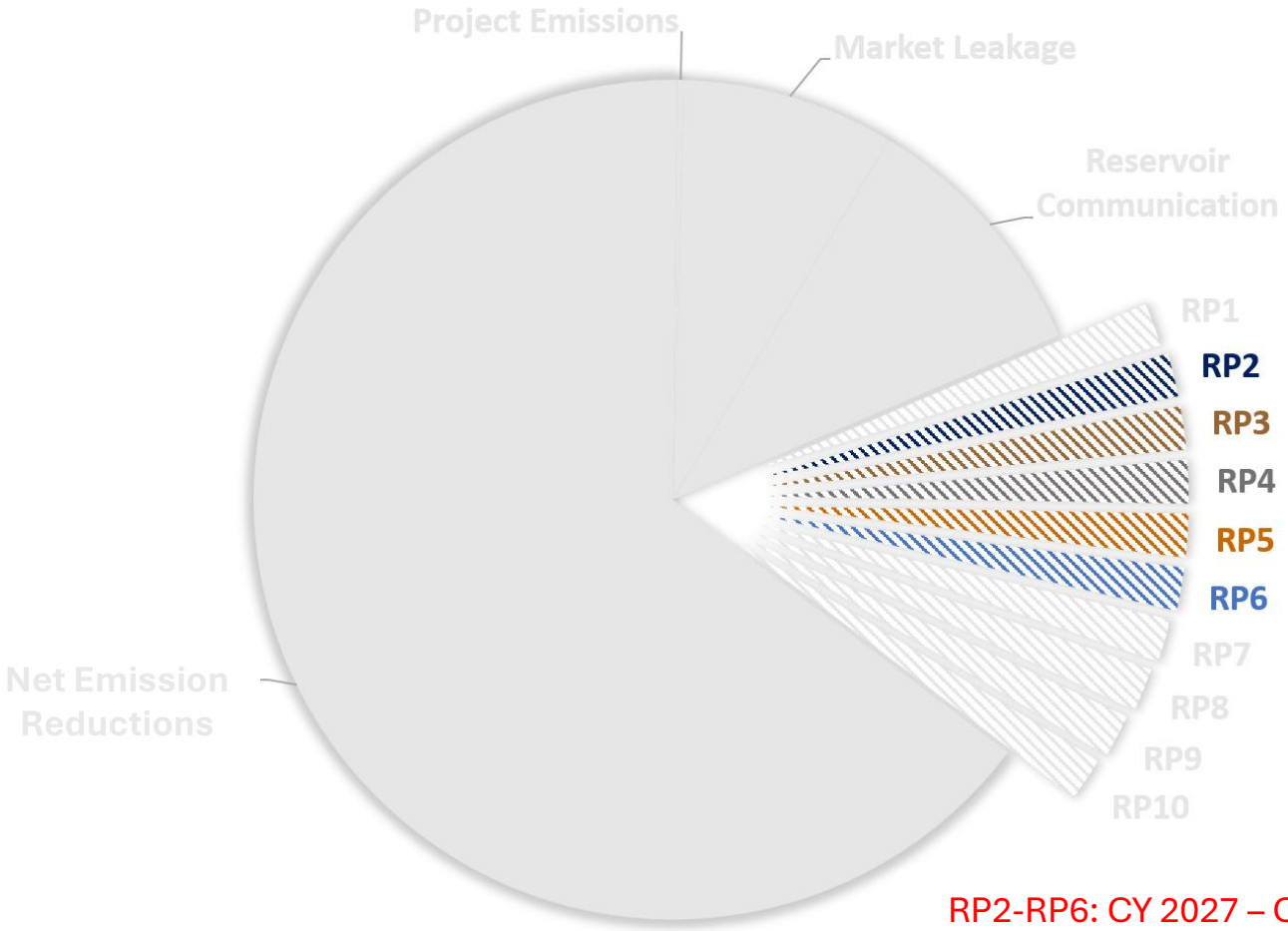
RP2: CY 2027



RP3: CY 2028

Option 1: project developers conduct annual monitoring and verification

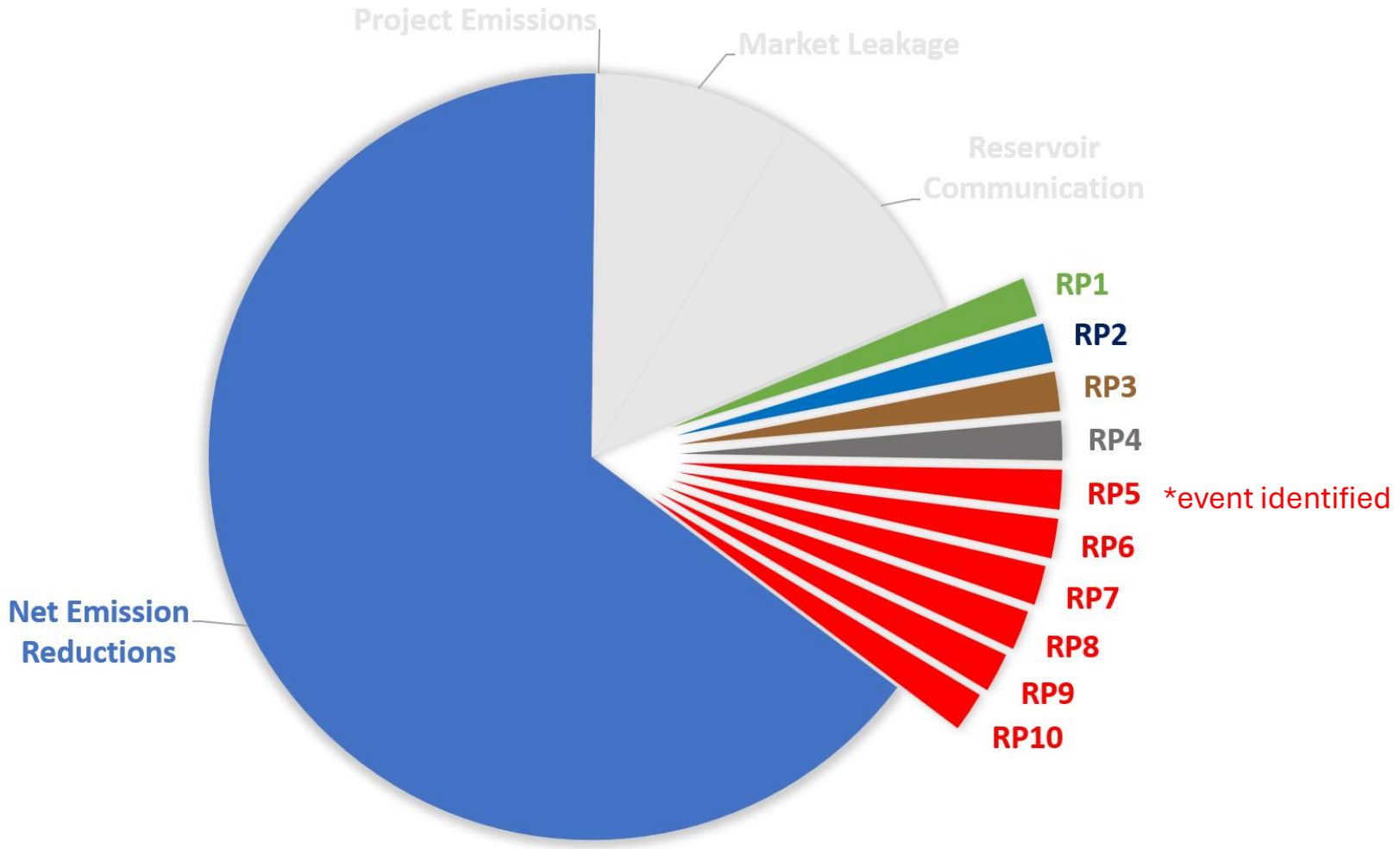
Subsequent Verifications – Every 5 Years



RP2-RP6: CY 2027 – CY2031

Option 2: project developers conduct annual monitoring and verify every five years at a maximum

Identifying Recovery/Non-Recovery Event(s)



If event does occur, no credits will be issued for that reporting period and subsequent reporting periods remaining in the crediting period

MONITORING, REPORTING, AND VERIFICATION

Project Monitoring

- Sampling procedures
- Chain of custody
- Gas chromatography analysis
- Third-party laboratory criteria

Determining Gas Composition

- Detailed procedures log
- Compliance with regulations
- Post-plug leak verification

Documenting P&A Processes

- New wells
- Recompletions
- Enhanced recovery
- Plug failure
- Regulatory change

Annual Monitoring

Reporting Period and Verification Period

Reporting periods: Length of time over which emission reductions from project activities are quantified

- No more than 12 months
- Must be continuous (no gaps in reporting)

Verification periods: Length of time over which GHG emission reductions are verified

- Initial verification covers the initial reporting period, up to 12 months of data
- Subsequent verifications may cover up to five reporting periods, with maximum of 60 months of data (12 months per reporting period)
- Interim monitoring report must be submitted annually if not verifying

Site visit must occur during the initial verification of each crediting period

CLIMATE ACTION RESERVE

Q&A

Clarifying Questions

We welcome your input, official comments must be submitted in writing October 14th

If you would like to ask a clarifying question:

- Please send a message to us via the chat function
- The message will only be sent to the Reserve as hosts (not all attendees)
- We will read out the message with names/organizations for context
- We will respond to as many comments/questions as possible

NEXT STEPS

Next Steps

Submit comments by 5:00 Pacific Wednesday, October 14

- Word or PDF format to policy@climateactionreserve.org

Reserve staff will review and respond to comments, with consideration for potential revisions to the protocol

- All comments and responses will be published online

Webinar recording and presentation slides will be published online

Protocol will be presented to the Reserve's Board of Directors to be considered for adoption in November 2026 (tentatively)

Contact Information

Protocol Development Team:

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rmooney@climateactionreserve.org

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General Inquiries:

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CLIMATE ACTION RESERVE

THANK YOU