



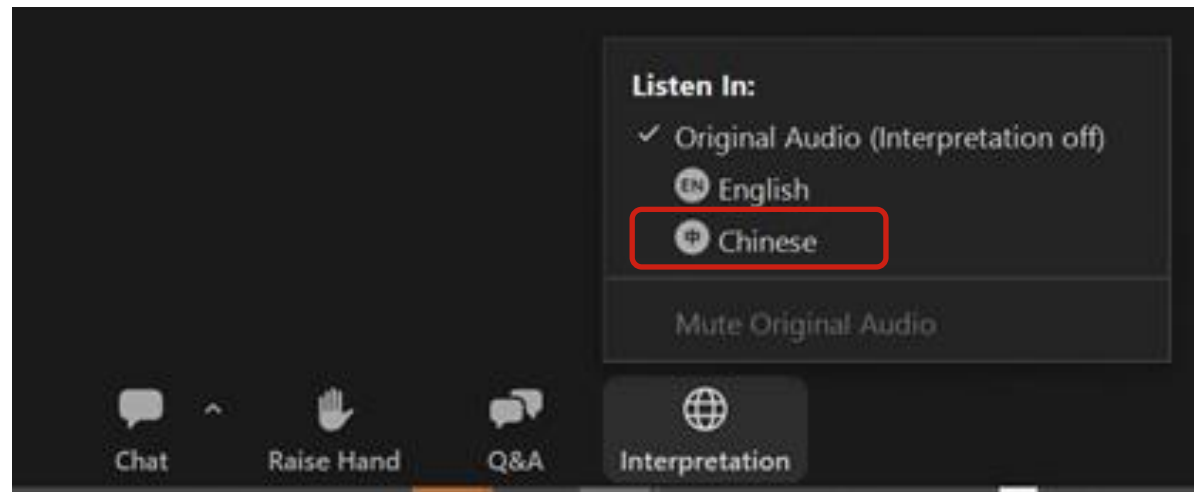
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Public Kick-Off Meeting: China Adipic Acid Production Protocol Version 1.0

March 6, 2023

Simultaneous Translation

- This meeting we are utilizing simultaneous translation provided by Speed Asia
- To switch languages from English to Mandarin, select “Chinese” as highlighted below from your zoom panel



- Attendees that are listening under the interpretation setting will be able to hear the translation at a higher volume, and English will be present at a lower volume
 - To only hear the translator, you can select “mute original audio”
- Attendees that prefer Mandarin may follow along using the Mandarin slides provided in the chat

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

AGENDA

- Climate Action Reserve
- Background on adipic acid production industry
- Protocol development process/timeline
 - REMINDER:
 - Statements of Interest for the technical workgroup due **March 17, 2023**
 - Stakeholder Engagement Forms available
- Key considerations for protocol development
 - Project definition
 - Project ownership
 - Additionality
 - Permanence
 - Quantification
 - Monitoring / reporting / verification
- Next steps

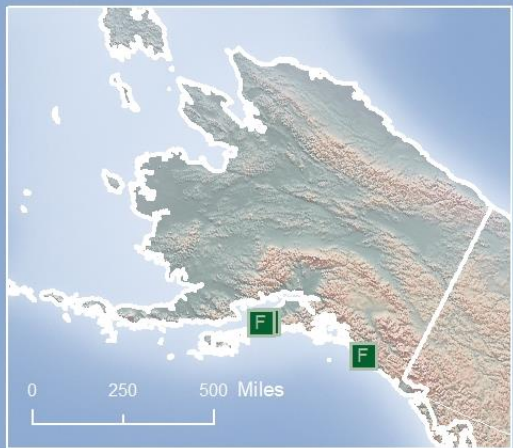


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Climate Action Reserve



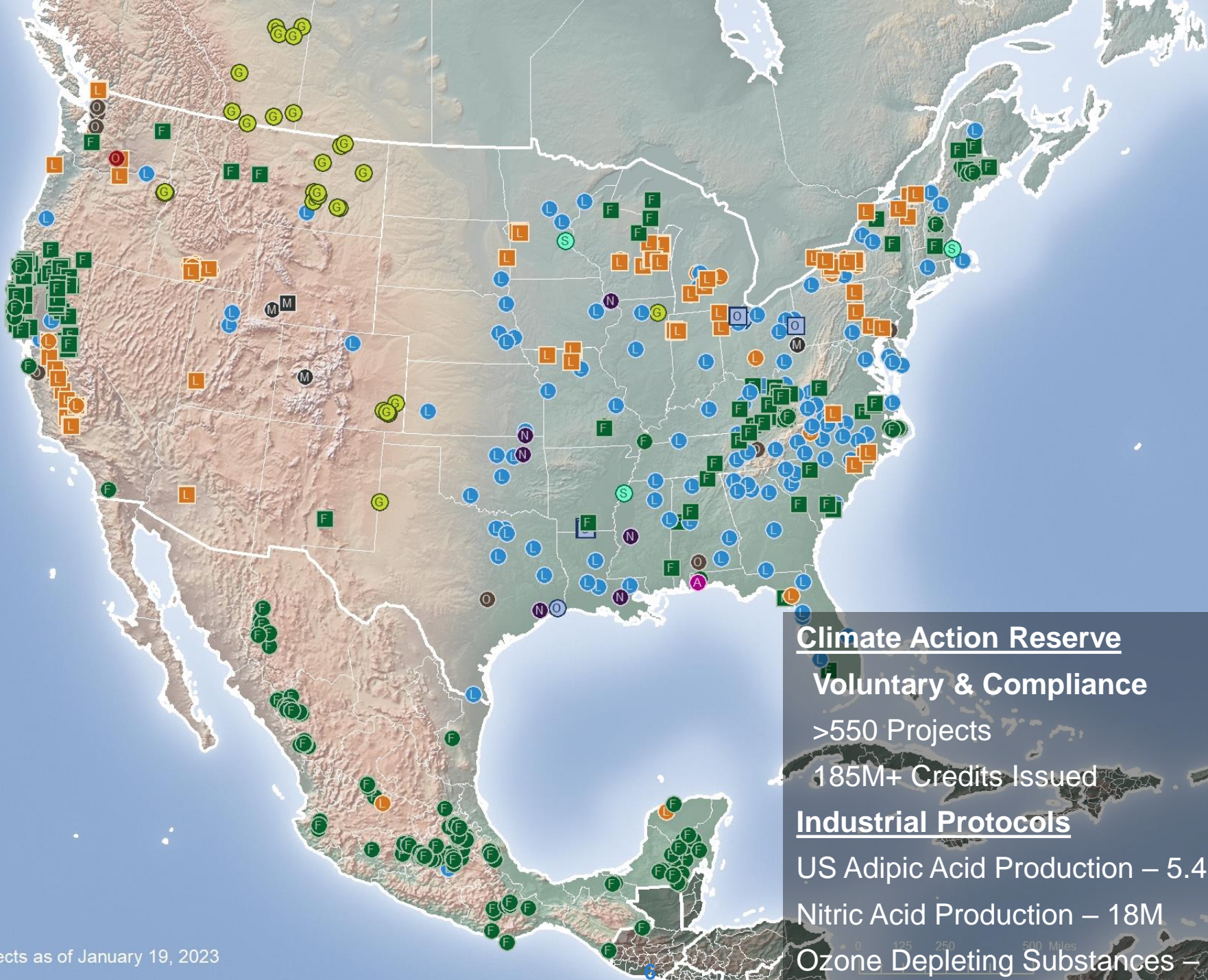
- Mission: to develop, promote and support innovative, credible market-based climate change solutions that benefit economies, ecosystems and society
- Develop high-quality, stakeholder-driven, standardized carbon offset project protocols for global carbon credit markets
- Accredited Offset Project Registry under the California cap-and-trade program, and CORSIA
- Serve compliance and voluntary carbon markets
- Reputation for integrity and experience in providing best-in-class registry services for offset markets



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- Adipic Acid
- Forest
- Forest (ARB)
- Grassland
- Landfill
- Livestock
- Livestock (ARB)
- Mine Methane
- Mine Methane (ARB)
- Nitric Acid Production
- Nitrogen Management
- Organic Waste Composting
- Organic Waste Digestion
- Ozone Depleting Substances
- Ozone Depleting Substances (ARB)
- Soil Enrichment

Listed, Registered, Transitioned, & Completed Projects as of January 19, 2023



Climate Action Reserve
Voluntary & Compliance
 >550 Projects
 185M+ Credits Issued

Industrial Protocols
 US Adipic Acid Production – 5.4M
 Nitric Acid Production – 18M
 Ozone Depleting Substances – 19M

Background: Why Adipic Acid Production in China

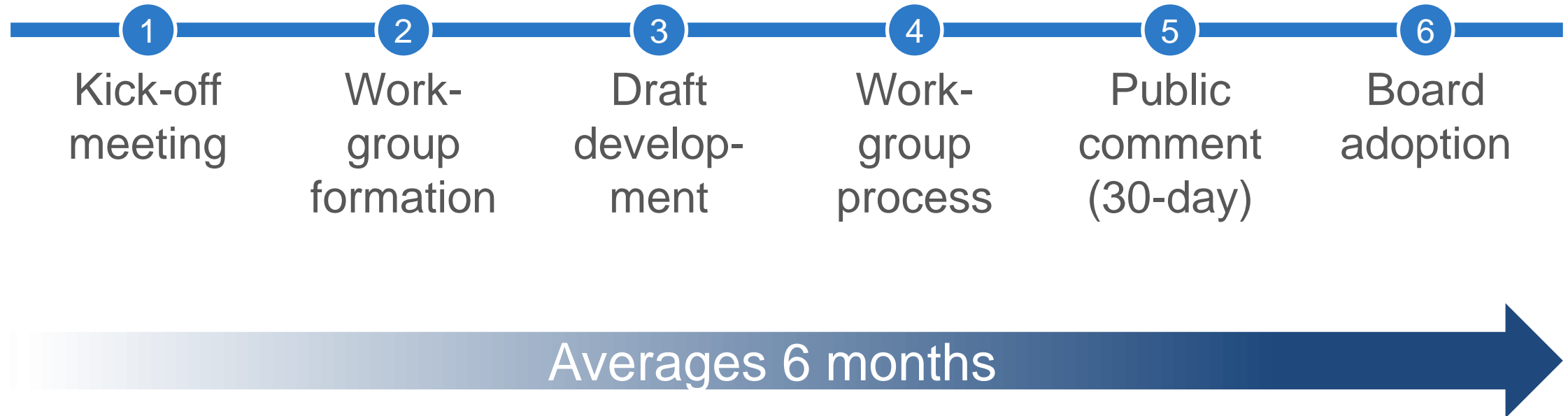
- Adipic acid's primary use is in the manufacturing of nylon 6,6-polyamide
- Nitrous Oxide (N₂O) is a by-product of adipic acid production (AAP)
 - Global warming potential 265 times that of CO₂ (IPCC AR5)
- Over 3 million metric tonnes of global production in 2015
 - US and China are two of the largest sources
- Production in China is expected to increase 5.5%
- Climate Action Reserve developed an US Adipic Acid Protocol in September 2020
- Installing N₂O abatement technology is an important step in reducing global emissions



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DEVELOPMENT PROCESS & TIMELINE

Protocol Development Timeline



Stakeholder Engagement & Workgroup

- Stakeholder participation & feedback is critical to protocol development
- Stakeholder Engagement form helps the Reserve identify & communicate with interested stakeholders throughout the protocol development process
- 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
- 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
- Interested stakeholders invited to submit one of two forms on our website
 - Observer: Please submit the **Stakeholder Engagement Form** at any time
 - Technical workgroup: Please submit the **Statement of Interest Form** by **March 17, 2023**

Workgroup Process and Expectations for Workgroup members

Process

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

Expectations

- Familiarity with the feedstocks, technologies, and/or end uses for which the protocol is being developed, and/or solid understanding of project-based GHG accounting
- Review, comment on and provide recommendations on specific protocol criteria
- Participate in meetings via webinar with simultaneous translation
- 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
- Typically only 10-20 participants will be selected
- An email will be sent out to selected candidates
- Persons not selected in the workgroup may be included as “observers”
- **Deadline: March 17, 2023**

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 protocol development process
- Can also submit comments during the public comment period
- **Deadline: ongoing**



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KEY CONSIDERATIONS FOR PROTOCOL DEVELOPMENT



Key considerations for protocol development

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



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ELIGIBILITY REQUIREMENTS

Project Definition

- Defined as: the installation and operation of a new, previously uninstalled N₂O abatement technology AND/OR the enhancement of an existing control technology at a single plant that results in the reduction of N₂O emissions
- It is possible to register multiple projects at one facility, each with its own start date, crediting period, registration, and verification
- “Enhancement” constitutes the implementation of a capital investment expenditure to improve abatement efficiency of existing controls compared to historical efficiency levels

Project Definition

- Four Approved technologies

Approved N₂O Control Technologies for Adipic Acid Projects

Abatement Type	Description	Example
Catalytic Destruction	Destroy N ₂ O using a catalyst – selective catalytic reduction (SCR) or non-selective catalytic reduction (NSCR)	Noble or precious metal catalysts
Thermal Destruction	Destroy N ₂ O using flame burners with pre-mixed CH ₄ or natural gas	Thermal Reduction Units (TRUs)
Recycle to Nitric Acid	Recycle N ₂ O to create nitric acid by burning the gas at high temperatures with steam	Nitrogen recycling adiabatic reactor
Recycling / Utilization Technologies	Utilize N ₂ O as a reactant or input to produce other products	Using N ₂ O off gas as an oxidant to produce phenol from benzene

Project Ownership

- “Project developer” is the entity with an active account with the Reserve and is responsible for project reporting and verification
 - May be facility owners, entities that specialize in project development, abatement technology suppliers, or other entities
- Must demonstrate clear ownership of the GHG reductions
- Ownership must be established by clear and explicit title and sign the Reserve’s Attestation of Title form
- Must be liable for the emissions of the AAP (i.e., entity on plant’s operating permit), unless the rights to emission reductions have been transferred to another entity

Eligibility Rules

- Only projects located at AAPs in China are eligible
 - Regions subject to China's Emissions Trading Scheme (ETS) that cover N₂O abatement at adipic acid plants are excluded
- Start Date is defined on the date on which production first commences after the installation or enhancement of abatement technology.
 - Must be submitted within 12 months for listing
- Crediting period is 10 years from the start date unless it becomes legally required
- May be eligible for a second crediting period for a project lifespan of 20 years
 - Must meet eligibility requirements of the most recent protocol when applying for second CP
 - Begins the day following the end of the first crediting period

Additionality Requirements

- Must be additional – yield a surplus of GHG reductions that are additional to what would have occurred in the absence of the value of the carbon credits
- Must satisfy the following two tests:
 - Performance Standard Test
 - Installing one of the four approved N₂O control technologies and/or enhancing an existing one
 - Legal Requirements Test
 - Passes when there are no laws, regulations, or other legally binding mandates requiring the installation of N₂O abatement technology
 - Projects required to abate N₂O emissions under China’s Emissions Trading Scheme or China’s Certified Emissions Reduction Scheme are not eligible

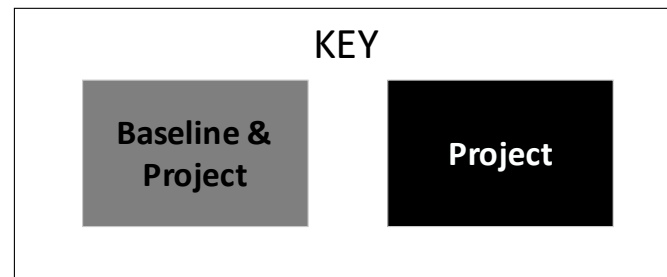
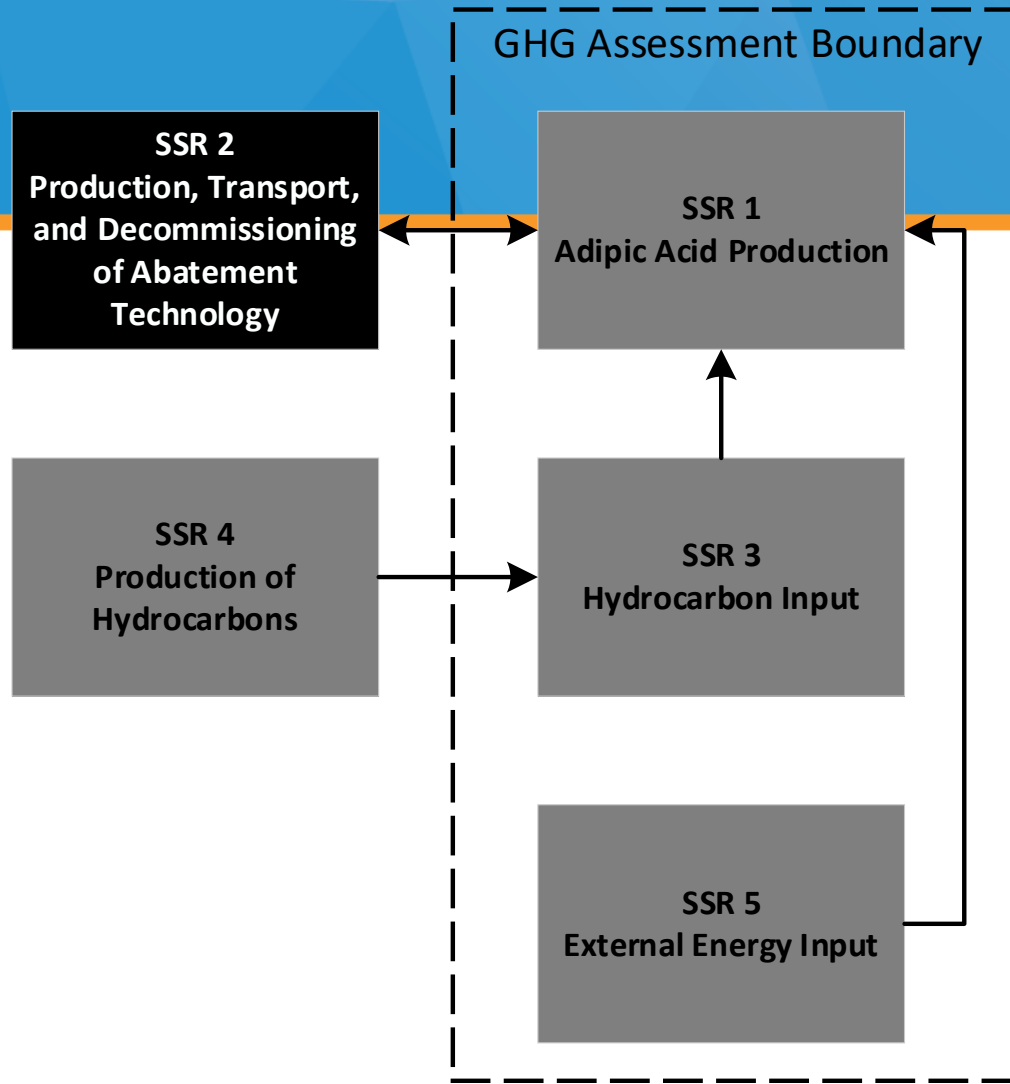
Regulatory Compliance

- Project developers must attest that project activities do not cause material violations of applicable laws (e.g., air, water quality, safety, etc.)
- Must sign an Attestation of Regulatory Compliance at each verification
- Must disclose in writing all instances of legal violations caused by project activities
- If the verifier and the Reserve determine that project activities have caused a material violation, then CRTs will not be issued for GHG reductions that occurred during the period(s) when the violation occurred
- Administrative violations and “acts of nature” do not impact crediting
 - Re-occurring administrative violations related to project activities may affect crediting



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GHG QUANTIFICATION



SSR: Sources, Sinks, and Reservoirs
Relevant gases: CO₂, CH₄, N₂O

Quantifying GHG Emission Reductions

- Baseline Emissions calculated based on the:
 - Total annual N₂O emissions before any emissions control treatment
 - Nitric acid use ratio
- Protocol mandates a static 90% abatement efficiency in the baseline to minimize leakage and reflect common international practice
- Project Emissions calculated based on the:
 - Measured N₂O emissions in the off gas from project N₂O control units
 - GHG emissions from the use of hydrocarbons as a reducing agent or to reheat off gas
 - GHG emissions from increased external energy use



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MITIGATING LEAKAGE

Mitigating Leakage

- Leakage may occur if an AAP with a project begins to produce more adipic acid than it otherwise would because the value of the carbon offset creates an incentive to shift production to the respective AAP and/or to maintain and/or increase production at levels above market conditions
 - Development process to consider a potential production limit to avoid this problem
- Utilize a 90% baseline abatement efficiency
- If the facility is a part of a group that controls more than one AAP, they must assess average annual factory loading of the project AAP during the baseline look-back period, relative to the AAP factory loading during each reporting period
- If not part of such group, they may seek approval demonstrating the threat is minimal through an alternative assessment



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MONITORING AND QA/QC REQUIREMENTS

- A monitoring plan must be established for all monitoring and reporting activities associated with the project to ensure all requirements of the protocol are met
- Must follow relevant sections of the Professional Standard of the People's Republic of China, HJ 75-2017, Specifications for Continuous Emissions Monitoring of SO₂, NO_x, and Particulate Matter in the Flue Gas Emitted from Stationary Sources – as indicated in protocol Sections 6.1 - 6.3.
- HJ 75-2017 provides guidance on the standards of performance for continuous emission monitoring systems (CEMS) for NO_x emission measurements, which is also applicable to N₂O emission testing at AAPs
- Initial Monitoring Requirements:
 - System installation and certification
 - Calibration
 - Accuracy testing



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REPORTING AND VERIFICATION CYCLES



Reporting Period and Verification Cycle

- Reporting period: length of time that GHG emission reductions from project activities are quantified
 - Maximum 12 months, but may be sub-annual (e.g., monthly, quarterly, semi-annually)
 - Each reporting period must be verified by a third-party verification service
 - Must be continuous
- Verification cycle: length of time over which GHG emission reductions from project activities are verified
 - Site visits are required (frequency is still TBD)
 - After the initial reporting period, two reporting periods may be verified at once
- Verification documents are required to be submitted to the Reserve no more than 12 months after the end of the reporting period.



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NEXT STEPS

Protocol development process & timeline

Milestone	Date (USA)
Public kick-off meeting	March 6, 2023
Statements of Interest Form (Workgroup)	March 17, 2023
Formation of workgroup	By end of March 2023
Staff drafts protocol	January – March 2023
Workgroup meetings	April/May 2023
Public comment period	Summer 2023
Protocol presented to Reserve Board for approval	Fall 2023

- ***For interested stakeholders:***
 - Submit Stakeholder Engagement Form (ongoing)
 - **Submit a Statement of Interest to become a workgroup member (by March 17, 2023)**
 - Email interest to sign up for updates as an observer
 - Email us feedback anytime
- ***For Reserve:***
 - Form workgroup
 - First Workgroup meeting April (via webinar)

Key contacts

- ***Climate Action Reserve:***
 - Rachel Mooney, Analytical Associate
Email: rmooney@climateactionreserve.org



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THANK YOU!