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
➢ 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
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
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

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

1. Kick-off meeting
2. Work-group formation
3. Draft development
4. Work-group process
5. Public comment (30-day)
6. Board adoption

Averages 6 months
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
KEY CONSIDERATIONS FOR PROTOCOL DEVELOPMENT
Key considerations for protocol development

- Project definition
- Project ownership
- Additionality
- Quantification
- Monitoring
- Reporting & Verification
ELIGIBILITY REQUIREMENTS
• 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

<table>
<thead>
<tr>
<th>Abatement Type</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalytic Destruction</td>
<td>Destroy N₂O using a catalyst – selective catalytic reduction (SCR) or non-selective catalytic reduction (NSCR)</td>
<td>Noble or precious metal catalysts</td>
</tr>
<tr>
<td>Thermal Destruction</td>
<td>Destroy N₂O using flame burners with pre-mixed CH₄ or natural gas</td>
<td>Thermal Reduction Units (TRUs)</td>
</tr>
<tr>
<td>Recycle to Nitric Acid</td>
<td>Recycle N₂O to create nitric acid by burning the gas at high temperatures with steam</td>
<td>Nitrogen recycling adiabatic reactor</td>
</tr>
<tr>
<td>Recycling / Utilization Technologies</td>
<td>Utilize N₂O as a reactant or input to produce other products</td>
<td>Using N₂O off gas as an oxidant to produce phenol from benzene</td>
</tr>
</tbody>
</table>
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
GHG QUANTIFICATION
SSR: Sources, Sinks, and Reservoirs

Relevant gases: CO2, CH4, N2O

KEY
Baseline & Project  Project

GHG Assessment Boundary

SSR 1
Adipic Acid Production

SSR 2
Production, Transport, and Decommissioning of Abatement Technology

SSR 3
Hydrocarbon Input

SSR 4
Production of Hydrocarbons

SSR 5
External Energy Input
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
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
MONITORING AND QA/QC REQUIREMENTS
Project Monitoring

• 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, NOx, 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 NOX emission measurements, which is also applicable to N2O emission testing at AAPs.

• Initial Monitoring Requirements:
  – System installation and certification
  – Calibration
  – Accuracy testing
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.
NEXT STEPS
## Protocol development process & timeline

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

• 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
THANK YOU!