

A-Gas V7

February 18, 2022

A-Gas



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A.

PROJECT OVERVIEW

A1. PROJECT TITLE

A-Gas V7

A2. PROJECT TYPE

Industrial Process Emissions - Use of Certified Reclaimed HFC Refrigerants

A3. PROOF OF PROJECT ELIGIBILITY

Table 1: Eligibility Requirements

Criterion	Requirement	Proof of Project Eligibility
Start Date	Non-AFOLU Projects must be validated within 2 years of the project Start Date.	Project Start Date of January 20, 2021
Minimum Project Term	The Minimum Project Term for specific project types is specified in the relevant ACR sector standard and/or methodology. Project types with no risk of reversal subsequent to crediting have no required Minimum Project Term.	There is no risk of reversal for this project type.
Crediting Period	The Crediting Period for non-AFOLU projects shall be ten (10) years.	The crediting period is 10 years.
Real	GHG reductions and removals shall exist prior to issuance. ACR will not forward issue nor forward register a projected stream of future offsets.	GHG reductions take place at the displacement of virgin HFC production, which takes place prior to the issuance.

Emission or Removal Origin	Project Proponent shall own, have control, or document effective control over the GHG sources/sinks from which the emissions reductions or removals originate. If the Project Proponent does not own or control the GHG sources or sinks, the Proponent shall document that effective control exists over the GHG sources and/or sinks from which the reductions/removals originate.	A-Gas holds and retains title to the HFC refrigerant from the purchase through reclamation, up until the sale of the AHRI certified reclaimed.
Offset Title	Project Proponent shall provide documentation and attestation of undisputed title to all offsets prior to registration, including chain of custody documentation if offsets have ever been sold in the past. Title to offsets shall be clear, unique, and uncontested.	A-Gas has provided documentation of undisputed title to all offsets. Title to offsets is clear, unique, and uncontested.
Land Title	For U.S. projects, Project Proponent shall provide documentation of clear, unique, and uncontested land title. For international projects, Proponent shall provide documentation and/or attestation of land title; ACR may require a legal review by an expert in local law. Land title may be held by a person or entity other than the Project Proponent, provided the Project Proponent has clear, unique, and uncontested offsets title.	Not applicable to project type.

<p>Additional</p>	<p>Every project shall use either an ACR--approved performance standard and pass a regulatory surplus test or pass a three--pronged test of additionality in which the project must: 1) exceed regulatory/legal requirements; 2) go beyond common practice; and 3) overcome at least one of three implementation barriers: institutional, financial, or technical.</p>	<p>This project passes the regulatory surplus test and the ACR--approved practice--based performance test.</p> <p><i>Regulatory Surplus Test:</i> The project is not mandated by any existing law, regulation, statute, legal ruling, or other regulatory framework.</p> <p><i>Practice--Based Performance Standard:</i> A review of US EPA's reclamation data indicates that the HFC refrigerant sector has a low market adoption rate for using certified reclaimed HFCs.</p>
<p>Regulatory Compliance</p>	<p>Projects must maintain material regulatory compliance. To maintain material regulatory compliance, a project must complete all regulatory requirements at required intervals. Project Proponents are required to provide a regulatory compliance attestation to a verification body at each verification. This attestation must disclose all violations or other instances of noncompliance with laws, regulations, or other legally--binding mandates directly related to project activities.</p>	<p>This project maintains material regulatory compliance for the entire reporting period.</p>

Permanent	For projects with a risk of reversal of GHG removal enhancements, Project Proponents shall assess risk using an ACR--approved risk assessment tool.	There is no risk of reversal of GHG removal enhancements for project type.
Net of Leakage	ACR requires Project Proponents to assess, account for, and mitigate certain types of leakage, as summarized in relevant sector standards and approved methodologies. Project Proponents must deduct leakage that reduces the GHG emissions reduction and/or removal benefit of a project more than any applicable threshold specified in the methodology.	Projects involving certified reclaimed HFC refrigerant would not increase demand for refrigerant beyond current baseline demand, i.e., use of more reclaimed refrigerant would not cause an increase in virgin HFC production (to the contrary), or increase refrigerant emission rates. Therefore, for this project, "leakage" can be disregarded.
Independently Validated & Verified	ACR requires third--party validation and verification, by an ACR--approved Validation/Verification Body (VVB), at specified intervals to issue ERTs. Governing documents for validation and verification are the ACR Standard, relevant sector standard, relevant methodology, and the ACR Validation and Verification Guideline.	This project will be validated and verified by third-party, ACR-approved, ANAB Accredited Verification Body, First Environment.

Community & Environmental Impacts	ACR requires community and environmental impacts to be net positive overall. Project Proponents shall document in the GHG Project Plan a mitigation plan for any foreseen negative community or environmental impacts and shall disclose in their Annual Attestations any negative environmental or community impacts or claims of negative environmental and community impacts.	There are no negative community or environmental impacts for this project type.
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A4. LOCATION

Wood County, Bowling Green, Ohio USA Latitude: 41.3755 Longitude: -83.6504



A5. BRIEF SUMMARY OF PROJECT

Description of Project Activity:

A-Gas US Inc's Voluntary Emission Reduction Project A-Gas V7 involves the recovery, reclamation, re-sale, and use of AHRI 700 certified HFC refrigerants to service/re-charge existing and newly manufactured refrigeration and air conditioning equipment in the US. The benefit of using reclaimed HFCs is that it avoids future production of virgin high GWP HFCs and subsequent GHG emissions.

Background Information:

A-Gas has entered into an agreement with GlaxoSmithKline (GSK) to process their rejected Metered Dosage Inhalers (MDIs) and their bulk material that comes from the GSK MDI aerosol production lines, to avoid incineration of the HFC-134a and medicine contents. A-Gas has the capabilities to reclaim and separate the HFC-134a and medicine while also shredding the metal/plastic components of the MDIs to avoid further use. The GSK bulk material is reclaimed and processed without the initial MDI processing with the shredder or crusher.

Project Purpose and Objective:

The purpose of the business relationship between A-Gas and GSK has always been the need for a more environmentally friendly way to dispose of the rejected MDIs and the bulk material from the production of MDIs. As this material can be rejected for any reason against the Pharmaceutical Industry Specifications, the HFC-134a is the highest quality of reclaim currently out in the market. The objective of this project is to offset the production of virgin HFC refrigerants creating GHG emissions by implementing the recovery, reclamation, and the reselling of used HFC refrigerants thereby resulting in emission reductions.

A6. PROJECT ACTION

Description of prior physical conditions:

Our project actions occur within the USA & did not result in the release of GHGs outside of this geography. All recovery, reclamation, and sale activities have occurred and have contributed to emission reductions that will undergo verification by an independent verifier.

- We ensure that our technicians, our equipment, our record keeping, and our operational activities on and off site meet the necessary Section 608 requirements of the Clean Air Act obligations for Stationary Refrigeration and Air Conditioning; this will ensure that we are further preventing and minimizing venting of emissions throughout our processes.

Description of how the project will achieve GHG reductions and/or removal enhancements:

The project will achieve GHG reductions by reducing the need for and reliance on the import and manufacture of virgin high GWP HFCs for servicing existing and new refrigeration, domestic, and industrial air conditioning equipment that continue rely on HFCs for their operation.

Description of project technologies, products, services, and expected level of activity: **An overview of the project technologies and flow incorporating key activities are summarized below.**

The entire HFC-134a volume for this project was sent to A-Gas in Bowling Green, Ohio by one customer. The HFC-134a was originally pharmaceutical grade refrigerant (99.7 - 99.83%) that was mixed with Albuterol Sulfate (0.17<0.3%), a bronchodilator medication, during the customer's production of metered dosage inhalers (MDIs). The outputs from the customer's aerosol production line are the full MDIs and an overflow of the HFC-134a mixture into steel cylinders that A-Gas provides to the customer to safely capture the material. The customer does have their own larger, steel tank that is used in production that A-Gas will provide onsite recovery services into an A-Gas 20' steel transport tanker (ISO) annually. A-Gas refers to the customer's material not contained within MDIs as GSK bulk. The GSK bulk cannot be reused in the production of MDIs as the HFC-134a mixture is no longer considered a pharmaceutical grade product. Therefore, the GSK bulk contained in steel cylinders and steel ISO will be sent to A-Gas. The MDIs that are rejected during the customer's quality control process are also sent to A-Gas.

A-Gas arranges the logistics from the customer's site to A-Gas in Bowling Green, Ohio for the rejected MDIs and GSK bulk.

The MDIs arrive packaged in their boxes, wrappers, and containers. The containers consist of plastic and metal that are shredded during the process. The contents are a mixture of medicine and HFC-134a. The MDIs need to be unpackaged to be placed in the barrel of "the shredder"

The MDIs are sent through the shredder process to pull out and separate the medicine and the HFC-134a while shredding the plastic and metal containers to avoid further use. The HFC-134a is then sent through the distillation towers for additional reclamation back to industry specifications. The main purpose of this process is to blend lower purity, reclaimed HFC-134a back to industry specifications to be packaged and resold back to the market. By following this process, A-Gas is continuing the use of reclaimed HFC-134a, avoiding the need for virgin HFC-134a to be produced and introduced into the refrigerant market.

In 2021, a more advanced and efficient piece of equipment began processing the MDIs called "the crusher". The crusher is like the shredder with its purpose, but more technologically advanced with up to a 10% increase in MDI processing efficiency.

The Shredder Overview

The shredder operation includes the shredder unit, two wheeled, bulk tanks, super driers, shredder barrels, and gaylords for collection of shredded shrapnel from the MDI canisters. The unpackaged MDIs

are placed into the shredder barrels that are then led up the shredder conveyer belt into the shredder unit. The shredder unit then uses a separating procedure to pull out the HFC-134a and medicine, while simultaneously shredding the plastic and metal canisters. The shredder unit is connected to pumps that allow the HFC-134a and the medicine to flow through a super drier to remove additional moisture from the contents. Following the super drier, the HFC-134a and medicine flow into wheeled bulk tanks that will then be moved to the Towers for additional reclamation. The shrapnel from the MDI canisters are collected at from the bottom of the shredder unit into gaylords that will then be sent out for recycling.

The Crusher Overview

The crusher has two central processing sections, crushing and gas operations. The crushing operation is controlled through an HMI (Human Machine Interface). When a cycle is started, after a bin is loaded into the skip hoist, it raises this bin up and dumps it into the hopper. All these motions are controlled automatically through a programmable logic controller (PLC). After the bin has dumped all the MDIs into the hopper the lid is closed, and the skip hoist brings the bin back down to the ground. Now that the crusher is loaded with material the crushing begins. Using a hydraulic ram, the MDIs are crushed and compressed into bricks. When the brick becomes a certain length, it is transferred to the brick eject cylinder. Once enough bricks are in that cylinder a door is opened and the bricks are expelled into a bag for storage and disposal.

Pressure increases in the crushing unit due to the refrigerant being released from the MDI vessels. When that pressure reaches a set limit, valves are actuated using the PLC logic to allow the refrigerant to flow through the gas processing side of the crusher unit.

As the refrigerant flows it is moved through the product recovery tank, it is in this tank that most of the medicine falls to the bottom and the vaporized refrigerant continues through the system. A compressor is pulling this refrigerant through the system. After leaving the product recovery tank, it travels through a filter to remove any remaining contaminants, and then through a dryer where any moisture that was in the MDIs or introduced to the system through the opening of the hopper lid is removed. The refrigerant is then compressed and sent through an air-cooled heat exchanger where it is then sent to a liquid separator. The liquid separator stores liquified refrigerant at the bottom and pressurized non-condensable gases (NCGs) in the vapor space. As limit switches are hit, the refrigerant is transferred through use of pressure differential to bulk storage.

A-Gas then uses distillation towers to process and reclaim the HFC-134a back to AHRI standards to be resold into the market. GSK bulk processing begins at the towers because the HFC-134a mixture is already contained in steel cylinders/ISOs that have nozzles to connect and expel the HFC-134a mixture directly into the towers.

The Towers System Overview

The distillation column operation along with the associated tanks is for cleaning, separating and/or, reclaiming halons and refrigerants. The process uses many types of storage tanks such as feed tanks, storage tanks, or reclaim tanks from clients. The reclaim tanks from clients are pumped into larger tanks

for cleaning operations using a column or mobile air removal system (MARS). The MARS unit is a separate process of the operation used for degassing and will not be covered in this document. The columns are used to perform the separation of different halons or refrigerants by using their individual temperature properties as a means of separating them. After the halons or refrigerants are cleaned or separated, the productions are stored in storage tanks.

General Description of the Distillation Column Process

The distillation process starts with a feed tank that supplies a refrigerant to the middle position (or any position) of the column where some of it will immediately boil off to gas and some will flow as liquid to the reboiler tank at the bottom of the column. The reboiler tank at the bottom of the column contains an electric heater element that is used to heat the refrigerant in the tank to create gas that will flow up the column to the condenser. The condenser is part of an external refrigeration system that has a condensing cooling coil in the condenser tank where gas will form back to a liquid. The liquid in the bottom of the condenser tank is collected for a set time value and then some of the liquid refrigerant is sent via the reflux valve to the receiving tanks as top product. The rest of the product that is in the condenser is sent through the reflux valve back into the column as reflux gas. The reflux gas will go through the heating and cooling process multiple times where only a small amount will be sent to the receiving tank. On the bottom of the reboiler tank is a recirculation pump that pumps product continuously through a desiccant filter back into the bottom of the reboiler. A small amount of the product that is recirculated will be collected into a separate set of receiving tanks and this product is called bottoms product.

Post Reclaim & Separation Testing

Upon reclamation and/or separation via our distillation towers, samples are taken from the various tanks to be tested by our in-house AHRI Certified Laboratory or sent away for testing by an AHRI 700 certified laboratory, National Refrigerants, Inc. (NRI). The sample(s) must meet or exceed AHRI 700 certification requirements. If these requirements are not met, then additional processing will be required until the AHRI 700 certification specifications are met.

Packaging & Shipping to Aftermarket

Once the various bulk tanks have been successfully reclaimed and certified to meet AHRI specification, the reclaimed HFC-134a is repackaged in 30 Lb – 2,000 Lb cylinders, ready for resale. The AHRI Certified, reclaimed HFC-134a is then shipped by 3rd party logistics carrier directly to the customer or to a 3rd party warehouse for storage until a customer sends in a purchase order at which point it is shipped to the customer from the 3rd party warehouse.

A7. EX ANTE OFFSET PROJECTION

The following is the GHG emission reduction and removal enhancements from the reporting period stated in tonnes CO₂e.

Table 2: EX ANTE Emission Reductions

Vintage 2021

		Baseline reclaim rate	2.00%			
Refrigerant Type	Lbs Reclaimed and Sold	Annual Consumption (kgs)	10-yr Emission Rate	GWP	Emission Reductions	Rounded Emission Reductions
HFC-134a aerosol	322,385	146,231	100%	1301	186,441.927948	186,441

A8. PARTIES

Project Proponent & Reclamation Facility: A-Gas

A-Gas is one of the world leaders in the supply and life cycle management of specialty chemicals such as refrigerants, hydrocarbon blowing agents, and clean agent fire protection. A-Gas offers a full range of environmental services for the recovery and reclamation of environmentally sensitive products such as CFCs, HCFCs, HFCs, Halons and associated products. Our decades of experience, depth of knowledge, and commitment to environmental solutions is unrivaled in the industries we serve.

Project activities for A-Gas V7: A-Gas has reclaimed and sold all quantities of HFCs that makeup this project to customers in the wholesale and air conditioning sectors. A-Gas retains all environmental rights and benefits for all material from purchase through the resale. This applies to all ERTs that it has registered with ACR. A-Gas is responsible for contracting validation and verification services.

Contact:

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B.

METHODOLOGY

B1. APPROVED METHODOLOGY

This project will be certified according to ACR Standard, Version 7.0. It will also follow the rules and calculations as described in ACR's methodology: Emission Reduction Measurement and Monitoring Methodology for the Use of Certified Reclaimed HFC Refrigerants and Advanced Refrigeration Systems v 1.2.

B2. METHODOLOGY JUSTIFICATION

This project tracks source, reclamation, and sale documentation for the use of certified reclaimed HFC refrigerants to quantify emission reductions from displacing the production and eventual emissions of virgin HFC refrigerants. The chosen methodology provides the quantification framework for the creation of carbon credits from the reductions in GHG emissions resulting from the use of certified reclaimed HFC refrigerants. In Table 3, eligible segments, and sectors relevant to this project are highlighted.

Table 3: Eligible Refrigerant Sector & Segment		
Project Activity	Refrigerant Sector	Eligible Segments in Sector
Use of Certified Reclaimed HFC refrigerants	Industrial Process Refrigeration	Chemical, pharmaceutical, petrochemical and manufacturing industries, industrial ice machines and ice rinks.
	Domestic Refrigeration	Residential refrigerators and freezers
	Stationary Air Conditioning	Comfort cooling for homes and commercial buildings, including multi-family buildings, office buildings, hospitals, universities, shipping malls, airports, sports arenas.
	Commercial Refrigeration, also known as Retail Food Refrigeration	Equipment used to store and display chilled and frozen goods for commercial sale such as in supermarkets, convenience stores, bakeries, and restaurants. This equipment includes centralized supermarket systems, remote condensing units, and stand-alone equipment (e.g., beverage vending machines, stand-alone display cases).

B3. PROJECT BOUNDARIES

Physical boundary: The physical boundary is A-Gas located at 1100 Haskins Road in Bowling Green, Ohio 43402. A-Gas is an EPA certified refrigerant reclaimer. It is the physical and geographical site where the recovered HFC refrigerant is reclaimed in the project for use in equipment operations and servicing/recharging to replace refrigerant that leaks or to charge newly manufactured refrigeration or air conditioning equipment.

Temporal boundary: Per the methodology, projects shall have one reporting period not to exceed 12 months in length. Per the ACR Standard, the project Start Date is the date on which the project began to reduce GHG emissions against its baseline. The reporting period for this project is January 20, 2021 through December 9, 2021. This is one reporting period that is less than 12 months in length, which complies with the temporal boundary stated in the methodology.

B4. IDENTIFICATION OF GHG SOURCES AND SINKS

Table 4: Greenhouse Gases and Sources (*Stated within Methodology*)

GHG Source, Sink, or Reservoir (SSR)		Source Description	Gas	Included (I) or Excluded (E)	Justification
1	HFC Production	Fossil Fuel emissions from the production of HFCs	CO ₂	E	N/A
			CH ₄	E	N/A
		HFC leaks during HFC production	HFCs	E	N/A
2	Refrigerant Transport	Fossil Fuel emissions from the transport of HFCs	CO ₂	E	N/A
			CH ₄	E	N/A
			N ₂ O	E	N/A
		HFC leaks during HFC transport	HFCs	E	N/A
3	Equipment Manufacture & Installation	Emissions of HFCs during manufacture or installation of refrigeration or A/C equipment or system or product	HFCs	E	N/A
4	Equipment Operations	Fossil Fuel emissions from the operation of the refrigeration or A/C equipment or system	CO ₂	E	N/A
			CH ₄	E	N/A
			N ₂ O	E	N/A
		HFC leaks from the operation of the refrigeration or A/C equipment or system or product	HFCs	I	Equation 1
5	Service Equipment	Fossil Fuel emissions from servicing refrigeration or A/C equipment or system to replace leaked refrigerant	CO ₂	E	N/A
			CH ₄	E	N/A
			N ₂ O	E	N/A
		HFC emissions from servicing refrigeration or A/C equipment to replace leaked refrigerant	HFCs	I	Equation 1
6	Equipment Disposal	Emissions from the disposal of the equipment at end-of-life including destruction of refrigerant	HFCs	E	N/A

B5. BASELINE

The baseline scenario comprises the emissions that would take place without the use of certified reclaimed HFC refrigerant. It is equal to the total amount of reclaimed HFC refrigerant produced and the subsequent sale, title-transfer or return to a refrigerant distributor, refrigerant wholesaler, or an end-user for use in refrigeration or air conditioning equipment during the reporting period. In the absence of this project, most of the refrigerant used to recharge a system would have come from virgin HFC production along with some small portion of reclaimed HFCs (current reclamation rate).

The baseline HFC refrigerant reclamation rate is provided in the methodology and is set at 2%.

B6. PROJECT SCENARIO

For this project, refrigerant gas HFC-134a was recovered from the rejected metered dosage inhalers (MDIs) and steel cylinders of the same material from the aerosol production line for the rejected MDIs in bulk, as sourced from GlaxoSmithKline (GSK) in Zebulon, NC. GSK is a leading pharmaceutical company that produces these prescription devices. GSK has contracted A-Gas to separate, reclaim, and dispose of these MDIs and the bulk MDI production overflow of HFC-134a. A-Gas coordinates the shipment of the rejected MDI gaylords from their facility to A-Gas in Bowling Green. A-Gas is an EPA certified refrigerant reclamation facility.

A-Gas receives the rejected MDIs and GSK bulk, separates the HFC-134a and medicine, shreds the MDI canisters to avoid further use, and reclaims the refrigerant to AHRI standards for resale into the refrigerant aftermarket. A-Gas specializes in aggregating, reclaiming, and mixing refrigerants. With knowledge and expertise regarding the relationship between refrigerants, oil, and contaminants, as well as the operation of chiller and refrigerant systems. Additionally, A-Gas has an AHRI Certified Laboratory onsite in Bowling Green.

A-Gas took title to the HFC refrigerant upon delivery and retained title throughout the transportation and reclamation processes. A-Gas sold the certified reclaimed gas to various HVAC industry companies to go into the refrigerant aftermarket. According to the methodology, it is assumed that any refrigerant sold or otherwise transferred from the reclaimer to a distributor, wholesaler, service technician, or an end-user that refrigerant will be used. The sale of reclaimed refrigerant to A-Gas HVAC customers, displaced the production and eventual emissions of virgin refrigerant gas.

B7. REDUCTIONS AND ENHANCED REMOVALS

All refrigerant that is produced will eventually reach the atmosphere unless destroyed. Currently, there is little incentive to reclaim and reuse HFC refrigerants because of the low costs associated with virgin HFC production. Using reclaimed refrigerant effectively displaces the use – and therefore avoids production and eventual emissions – of virgin refrigerant. Within the existing reclamation industry, there is capacity to significantly increase reclaimed refrigerant use. Thus, using reclaimed refrigerant results in a GHG reduction. Reclaimed refrigerant can be used both to “charge” newly manufactured equipment and systems, and to “charge” systems that leak during normal operations.

B8. PERMANENCE

There is no risk of reversal of GHG removal enhancements for project type.

C. ADDITIONALITY

C1. REGULATORY SURPLUS TEST

There are no requirements on the quantities of reclaimed HFC refrigerants that must be used for any application. Users are free to choose virgin HFC, stockpiled HFC, recycled or reclaimed HFC refrigerant in any amount of their choosing. There are regulatory requirements pertaining to certification of the equipment used to recover ODS refrigerants for servicing equipment and the service technicians that handle ODS refrigerants, as well as certification requirements for refrigerant reclaimers. These regulatory requirements must be complied with as part of projects involving HFC refrigerants for this project.

There is currently little incentive for recovery, reclamation, and re-sale of HFC refrigerants. Based on U.S. EPA data on reclamation of HCFC-22 (for which there is a strong incentive to recover and reclaim), and industry information, the percentage of available HFCs that are reclaimed in the U.S. is extremely low.

A-Gas continually monitors any changes in refrigerant policy and, where necessary, actively engages with regulators and registries when changes are being proposed to HFC regulations.

We conform to all laws relating to the handling of refrigerants and our recovery technicians hold the necessary EPA 608 licenses. All processing equipment used to process refrigerants follows local, state, and federal requirements.

C2. COMMON PRACTICE TEST

A market adoption analysis laid out in the methodology was conducted for the relevant HFC refrigerant sectors and segments. Review of US EPA's reclamation data indicates that the sectors and segments have a low market adoption rate for using certified reclaimed HFCs. Therefore, project activities within these sectors and segments qualify for offset credit creation under this Methodology.

D. MONITORING PLAN

D1. MONITORED DATA AND PARAMETERS

Monitoring Plan

A-Gas Personnel Roles and Responsibilities:

- 1) Sandra Hoffman – Project Documentation & Development
- 2) Zachary Babb – Point of Contact for Pharmaceutical Customer
- 3) JoLynn Schrader – Accounts Receivable for A-Gas / Sales Packets

GHG Management System Requirements:

- 1) All records for purchases, processing, and sales are kept at the Bowling Green, Ohio facility.
 - a. These are both hard copies and electronically store
 - b. Records are retained for a minimum of 7 years unless otherwise required
- 2) The methods used to generate data include accessing reports from the A-Gas inventory system, Cyltrak. This program tracks material from the time it enters the facility, through processing, packaging, and sale. This data is captured in real time and monitored daily by operators and Finance Inventory Control.
 - a. Within the system, there are identifiers that allow the tracking of material through purchase order numbers, reference numbers, lot numbers, serial numbers, batch numbers, and order numbers.
 - b. Manual entry sheets are required at each step of the data entry process. These manual entries are done while the information is input into the inventory system.
 - c. Data is checked/audited by several departments that have access to the Cyltrak system: Operations, Logistics, Quality Control, Finance, and Environmental Services. The documentation begins with Operations recording weight and material transfers and laboratory testing. This paperwork is then supplied to Quality Control to verify the weights and laboratory testing prior to passing the documents to Logistics for shipping. Once Logistics includes the bill of lading with the documentation, it is turned over to Finance for invoicing. Finance maintains ownership of process documentation and, once again, verifies refrigerant volumes that are processed for invoicing. Environmental Services utilizes all relevant information, discussed above, to verify that process documentation is complete including operations paperwork, quality control documentation including certificates of analysis, Logistics bills of lading, and Finance invoicing. This process documentation is then reviewed by at least two people within Environmental Services to validate refrigerant weights and information used to calculate GHG emission reductions.
- 3) All A-Gas scales are calibrated quarterly & equipment inspected regularly
- 4) Quality Control ensures the refrigerant has met AHRI 700 industry specifications based on lab sampling.
 - a. Samples of the material are turned into the AHRI Lab throughout the processing of the material.
- 5) Project implementation occurs once a reporting period has been established with all relevant data mentioned above is captured and completed.

<i>Data or Parameter Monitored</i>	$VR_{HFC, j, rp}$
<i>Unit of Measurement</i>	kg
<i>Description</i>	Total quantity of virgin HFC refrigerant j that would have been used to recharge equipment during the reporting period, derived from the quantity of monitored certified reclaimed HFC refrigerant that is documented according to the methodology.
<i>Data Source</i>	Purchase orders, operating records, & sales packets
<i>Measurement Methodology</i>	Reclaimer weighs the individual containers of reclaimed HFC refrigerant using calibrated weight scales
<i>Data Uncertainty</i>	Low
<i>Monitoring Frequency</i>	Determined once per reporting period
<i>Reporting Procedure</i>	Purchase orders, operating records, & Sales packets
<i>QA/QC Procedure</i>	Multiple A-Gas departments work in parallel during each process – Please refer to the detail description above.
<i>Notes</i>	

E.

QUANTIFICATION

E1. BASELINE

The baseline emissions are the emissions that would take place without the use of certified reclaimed HFCs. It is equal to the amount of HFC refrigerant reclaimed and the subsequent sale, title transfer or return to a refrigerant distributor, refrigerant wholesaler, or an end-user for use in refrigeration or air conditioning equipment during the reporting period. In the absence of the project, most of the refrigerant used to recharge the system would have come from virgin HFC production, and some would come from HFCs that would normally be reclaimed. The baseline calculation takes into consideration the 2% current HFC refrigerant reclamation rate.

The baseline emissions are calculated as follows:

$$BE_{HFC_{rp}} = \sum_n^y [(VR_{HFC,j,rp} \times ER10_{HFC,j} \times GWP_{HFC,j})] \times (1 - RR_{BL}) \div 1000$$

$BE_{HFC_{rp}}$	=	Baseline emission during the reporting period (tonnes CO ₂ e)
$VR_{HFC,j,rp}$	=	Total quantity of virgin HFC refrigerant j used to recharge equipment during the reporting period (kgs)
$ER10_{HFC,j}$	=	The 10-year loss rate of HFC refrigerant j from equipment (%)
$GWP_{HFC,j}$	=	Global warming potential of HFC refrigerant j
RR_{BL}	=	Baseline Refrigerant Reclamation Rate (% per year). This is the percentage of HFC that would be reclaimed in the business-as-usual case, currently estimated to be 2% per year

A-Gas V7, baseline calculations:

2021 Reclaim R-134a	
Parameter	Value
$BE_{HFC_{rp}}$	186,441 tonnes CO ₂ e
$VR_{HFC,j,rp}$	146,231 kgs
$ER10_{HFC,j}$	100%
$GWP_{HFC,j}$	1,301
RR_{BL}	2.00%

E2. PROJECT SCENARIO

By using previously used, reclaimed HFC refrigerants, this project displaces new production of virgin HFC. Any project related emissions from using reclaimed refrigerant, for example, from transport of

certified reclaimed HFCs, are considered negligible and outside the project boundary. Project emissions can be disregarded.

E3. LEAKAGE

Projects involving certified reclaimed HFC refrigerant would not increase demand for refrigerant beyond current baseline demand, i.e., use of more reclaimed refrigerant would not cause an increase in virgin HFC production or increase refrigerant emission rates. For this project, leakage can be disregarded.

E4. UNCERTAINTY

For the purposes of this methodology, it is assumed that from the time any reclaimed HFC refrigerant is sold or otherwise transferred from the reclaimer to a distributor, wholesaler, service technician, or an end-user that refrigerant will be used. There is no ex-post uncertainty accounted for in this methodology.

E5. REDUCTIONS AND REMOVAL ENHANCEMENTS

Project emission reductions during reporting period equals baseline emissions of HFC refrigerant during reporting period.

Parameter	Value
BE_{HFCrp}	186,441 tonnes CO ₂ e
ER_{rp}	186,441 tonnes CO ₂ e

E6. EX-ANTE ESTIMATION METHODS

Emission reductions from project A-Gas V7 used the equations within the Methodology to calculate the GHG reductions achieved during the reporting period. There is one reporting period for this project from January 20, 2021 – December 9, 2021.

Project	Vintage	Total ERTs (tonnes CO ₂ e) ₂
A-Gas V7	2021	186,441 tonnes CO ₂ e

F.
COMMUNITY & ENVIRONMENTAL
IMPACTS

F1. NET POSITIVE IMPACTS

Positive community impacts from the project include the reduction of emissions and economic benefit to refrigerant reclamation facilities. HFC refrigerants are the ozone friendly alternative to CFC and HCFC refrigerants, but HFC refrigerants are powerful greenhouse gases. As discussed, there is little incentive to reclaim and reuse HFC refrigerants because of the low costs associated with virgin production. Decreasing virgin production creates an emissions reduction. The purpose of this methodology is to transition the refrigerant industry from using virgin HFC refrigerants to using reclaimed HFC refrigerants.

There are no negative community or environmental impacts for this project. The Sustainable Development Goals set forth by the United Nations are met initially by the 9th goal to build resilient infrastructure, promote sustainable industrialization, and foster innovation through the recovery and reclamation of used HFCs that reduce reliance on virgin HFC production, eliminating the potential for release to the atmosphere. Goal 12, ensure sustainable consumption and production patterns, is also met as more HFC users are adopting sustainable infrastructure with the use of reclaimed HFCs, adding in the reduction of the future environmental costs of climate change. Additionally, Goal 13 (urgent action to combat climate change and its impacts) is met as recovery, reclamation, and reuse of HFCs results in fewer overall emissions of HFC and the associated climate change impacts that would result in the absence of the project.

F2. STAKEHOLDER COMMENTS

Not applicable for A-Gas V7

G.

OWNERSHIP AND TITLE

G1. PROOF OF TITLE

A-Gas retains title to all refrigerant and environmental attributes once purchased from the entity selling the material, or transferring to A-Gas for reclamation, destruction, and/or resale.

Additional evidence can be found on the A-Gas website: <https://www.agas.com/us/products-services/carbon-offsets/>

G2. CHAIN OF CUSTODY

The offsets from this project have not been bought or sold previously. There is no forward option contract for the offsets from this project.

G3. PRIOR APPLICATION

A-Gas has not applied for GHG emission reduction or removal credits for this project through any other GHG emissions trading system or program.

H.

PROJECT TIMELINE

H1. START DATE

The reporting period start date for this project is January 20, 2021. The reporting period begins on the date that the initial volume of certified reclaimed HFC was sold to an A-Gas Wholesale or HVAC customer.

H2. PROJECT TIMELINE

- Initiation of project activities: January 20, 2021
- Project term: January 20, 2021 – December 9, 2021
- Crediting period: January 20, 2021 – January 19, 2031
- Frequency of monitoring, reporting, and verification: Once during reporting period.
- GSK contracts A-Gas to reclaim the material used in their aerosol processing, a mixture of R-134a and medicine. GSK sends the rejects material to A-Gas, contained in MDIs or bulk cylinders used during the aerosol processing. A-Gas reclaims this material back to AHRI 700, industry specifications to be resold back into the market to reduce the need for virgin R-134a.