

Appendix III

Opportunities for Local Carbon Offset Credits in the Industrial Processes and Product Use Category

A Preliminary Review of Regulations and Protocols Related to Ozone Depleting Substances, Fugitive and Process Emissions, and Other Related Industrial Emissions

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1 INTRODUCTION

The Industrial Processes and Product Use emission category encompasses use of ozone depleting substances (ODS) substitutes with high global warming potential (GWP),¹ high GWP gases in semiconductor manufacturing, SF₆ losses from the electricity grid, and other fugitive and process emissions, including solvent and lubricant use. Emissions from energy consumption related to industrial activities is captured in the energy portion of the California Air Resources Board's (CARB) inventory of statewide emissions.

Emissions from this category represent about 4% of regional emissions.² Most of estimated emissions are related to the use of ODS substitutes. Several additional categories included in the CARB statewide inventory of industrial emissions are not represented here due to lack of activity or data. These categories include: cement production, hydrogen production, lead production, lime production, nitric acid production, asphalt production, and propylene oxide production.

Because there are numerous subcategories and for simplicity, emissions can be further grouped into four subcategories (Table 1). Remaining sections of this report are organized into these categories. While the ODS Substitutes category is used by CARB to characterize emissions, many of the greenhouse gas (GHG) reduction activities reduce ODS and not the substitutes. Section 2 of this report is titled "Ozone Depleting Substances" to account for this. Further, because high-GWP in semiconductor manufacturing and electric grid SF₆ losses either have limited emissions or no associated protocols, these emissions are summarized briefly in Section 4.

¹ See United States Environmental Protection Agency, Greenhouse Gas Emissions, Understanding Global Warming Potentials, Last Visited February 11, 2021: <https://www.epa.gov/ghgemissions/understanding-global-warming-potentials> (The GWP was developed to allow comparisons of the global warming impacts of different gases. Specifically, it is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of carbon dioxide (CO₂). The larger the GWP, the more that a given gas warms the Earth compared to CO₂ over that time period. The time period usually used for GWPs is 100 years. GWPs provide a common unit of measure, which allows analysts to add up emissions estimates of different gases (e.g., to compile a national GHG inventory), and allows policymakers to compare emissions reduction opportunities across sectors and gases.)

² San Diego Association of Governments, San Diego Forward: The Regional Plan, Appendix D 2012 Regional Greenhouse Gas Emission Inventory for the San Diego Region and Projections, 2015, p. 26: https://www.sdfoward.com/pdfs/RP_final/AppendixD-2012GreenhouseGasEmissionsInventoryfortheSanDiegoRegionandProjections.pdf (Note this is the last publicly available estimate of regional emissions.)

Table 1 Groupings of Emissions Categories for Industrial Processes and Product Use

Emissions Category and Group
Ozone Depleting Substance (ODS) Substitutes
Commercial use of ODS Substitutes
Residential use of ODS Substitutes
Transportation use of ODS Substitutes
Other Fugitive and Process Emissions
Fugitive emissions from solvent use
Industrial CO ₂ consumption
Industrial dolomite consumption
Industrial lubricant use (fuel consumption)
Industrial soda ash consumption
Transportation lubricant use (fuel consumption)
High GWP in Semiconductor Manufacturing
Semiconductor manufacturing
Electricity Grid SF₆ Losses
Imported electricity transmission (SF ₆)
In-state generation transmission (SF ₆)

1.1 Project Purpose and Methods

The goal of this project is to identify project opportunities to reduce or remove GHG emissions in the San Diego region that could be used to generate carbon offset credits (offset credits). To support this overall goal, the Energy Policy Initiatives Center (EPIC) identified categories of GHG emissions in the San Diego region; identified activities to reduce or remove emissions; identified related regulations that require such activities; identified related offset credit protocols; evaluated these protocols based on applicability to conditions in the San Diego region and the number of projects developed in the United States (U.S.), California, and the San Diego region; and, determined whether the offset credit protocols and related activities would be considered additional to what would have happened otherwise. The additionality determination is based on a two-part test. The legal requirement test determines whether the activity is required by legislation or regulation, or otherwise legally mandated. The common practice test determines whether the project activity is considered a common practice and would have happened otherwise for financial, technological, or other reasons. A more detailed discussion of the project approach is provided in Section 3 of the main project report.

This report summarizes the findings of this analysis for the Industrial Processes and Product Use category, including ODS, other fugitive and process emissions, and other related industrial emissions.

1.2 Key Findings

The following key findings are based on analysis conducted for this report.

- **Emissions from ODS and ODS Substitutes Constitute the Largest Source of Emissions in this Category** - ODS and ODS substitutes are the largest source of emissions in the industrial processes and product use category of emissions. The high global warming potential of these gases and ODS themselves means that small quantities of gas translate into large quantities of CO₂e. Also, because these gases represent a small amount of overall regional emissions, this implies that relatively small amounts of these gases exist in the region.
- **ODS Substitutes are or will be Directly Regulated** - Regulation of ODS substitutes is transitioning to address the high GWP of ODS substitutes in addition to ozone impacts, resulting in new, more stringent proposed regulation.
- **California's Cap-and-Trade Program Reduces Opportunities for Offset Credits** - California's Cap-and-Trade regulation applies to many eligible activities included in offset credit protocols. Cap-and-Trade regulates fugitive emissions from glass production and stationary combustion in the San Diego region, which limits potential additional offset credit project opportunities from these regulated emission sources. It is possible that activities to reduce GHG emissions in these sectors could be considered additional but determining ownership of GHG reductions can be problematic if the emission source is already regulated.
- **All Applicable Offset Credit Protocols in this Category are Considered Additional** - There are a total of 12 protocols that are active and cover activities applicable to the San Diego region (Table 2). Ten of these address activities to reduce emissions from ODS and two address lubricants. All are considered additional. However, two protocols are considered likely additional due to existing or expected bans of ODS substitutes and changes to ODS substitute regulation.
- **Most Related Projects Use CARB's Compliance Protocol** - About 70% of the identified projects fall under CARB's compliance protocol. The vast majority of these are in the U.S. but outside of California. Only two projects using industrial-related offset credit protocols are located in California and none are in the San Diego region.
- **Several Potential Offset Credit Project Opportunities Exist in this Category** - The following represent opportunities for GHG reduction activities in the San Diego region. The feasibility and scale of the opportunity was not considered as part of this project. These include:
 - Destruction of ODS, substitution to low- or no GWP alternatives for new or replacement equipment, and reclaiming and abatement of ODS substitutes;
 - Improvement in fuel consumption that cause emissions from industrial and transportation lubricants;
 - Collection and re-refining of lubricant oil that would not otherwise be re-refined;
 - Emission reduction related to glass production and stationary combustion facilities that are outside of the Cap-and-Trade program; and
 - Emission reduction through substitution of low- or no GWP solvents.

Table 2 Projects Related to Active/Applicable Protocols in the Industrial Processes/Product Use Category

GHG Reduction Activity/Protocol	US	CA	San Diego Region	Additionality Determination
Ozone Depleting Substitutes	244	2	0	
ACR Ozone Depleting Substances Compliance Offset Protocol (CARB)	95	0	0	Additional
CAR Ozone Depleting Substances Compliance Offset Protocol (CARB)	82	2	0	Additional
CAR Ozone Depleting Substances	35	0	0	Additional
ACR Transition to Advanced Formulation Blowing Agents in Foam Manufacturing and Use	28	0	0	Additional
ACR Advanced Refrigeration Systems	3	0	0	Likely Additional
VCS VM0001 Infrared Automatic Refrigerant Leak Detection Efficiency Project Methodology (not HFC-23)	1	0	0	Additional
ACR Certified Reclaimed HFC Refrigerants	0	0	0	Likely Additional
ACR Destruction of Ozone Depleting Substances and High-GWP Foam	0	0	0	Additional
VCS Ozone Depleting Substances Compliance Offset Protocol (CARB)	0	0	0	Additional
VCS VM0016 Recovery and Destruction of Ozone-Depleting Substances (ODS) from Products, v1.1	0	0	0	Additional
Other Fugitive and Process Emissions	4	0	0	
ACR Re-refining Used Lubricating Oils	3	0	0	Additional
ACR Recycling of Transformer Oil	1	0	0	Additional
Total Projects	248	2	0	

2 OZONE DEPLETING SUBSTANCES AND RELATED SUBSTANCES

Emissions in this subcategory derive from ODS and ODS substitutes³ use in the commercial, residential, and transportation sectors. These high-GWP gases are mainly used as refrigerants or as foam blowing agents. Three gases represent most emissions in this category: HFC-125, HFC-134a, and HFC-143a. Given the high GWP of these gases (Table 3), a small amount of gas translates into a large amount of carbon dioxide equivalent (CO₂e). Also, because these gases represent a small amount of overall regional emissions, this implies that there are relatively small amounts of these gases in the region.

Table 3 Global Warming Potential for Common Ozone Depleting Substance Substitutes⁴

Refrigerant Name	Trade or Common Name	CAS Name	Global Warming Potential*
R-125	HFC-125	Pentafluoroethane	3500
R-134a	HFC-134a	1,1,1,2-Tetrafluoroethane	1430
R-143a	HFC-143a	1,1,1-Trifluoroethane	4470

* GWPs listed are IPCC AR4 (2007), 100-year GWPs.

Because many GHG reduction opportunities exist related to ODS, we include ODS and ODS substitutes in this section. This section describes methods to reduce emissions, regulations related to these activities, related protocols, additionality related findings, other considerations, and a summary of GHG opportunities.

2.1 Methods to Reduce Emissions

There are several strategies to reduce emissions in this emissions subcategory. Activities to reduce ODS focus primarily on three main management actions: ODS destruction, ODS substitutes, and ODS and ODS substitutes reclamation or abatements.

- **ODS Destruction** - This activity addresses emissions from specific ODS industrial uses, material applications, and use in transportation. The activity includes destruction of eligible ODS, high-GWP foam blowing agents, or high-GWP insulation foam at a single qualifying destruction facility.
- **ODS Substitutes** - Substitution activities focus on the transition to both decrease the use of ODS and substitute existing ODS with low- or no GWP refrigerants in the industrial sector, including transportation uses. This includes activities to:
 - Transition to low-GWP blowing agents in foam manufacturing.
 - Transition to advanced refrigeration systems using U.S. EPA Significant New Alternatives Policy ("SNAP") approved low-GWP refrigerant in the large commercial

³ ODS Substitutes regulated by the U.S. EPA can be accessed here: <https://www.epa.gov/ozone-layer-protection/ozone-depleting-substances>.

⁴ California Air Resources Board, High – GWP Refrigerants, Last Visited March 23, 2021: <https://ww2.arb.ca.gov/resources/documents/high-gwp-refrigerants>.

refrigeration sector where the equipment⁵ has an initial charge of 50 pounds or more of refrigerant that are chlorofluorocarbons (CFC), hydrochlorofluorocarbons (HCFC), or hydrofluorocarbons (HFC) based.

- Institute bans on specific HFCs for transportation air conditioning and require low-GWP substitutes.
- **ODS and ODS Substitutes Reclamation and Abatement** - These activities focus on reducing emissions by reclaiming ODS and ODS substitutes or other proven abatement activities that reduce ODS emissions. These activities include:
 - Reclamation and use of certified reclaimed HFC refrigerants to service existing refrigeration and air conditioning equipment, including transportation air conditioning equipment.
 - Reclamation and use of certified reclaimed HFC refrigerants in newly manufactured refrigeration or air conditioning equipment, including transportation air conditioning equipment.
 - Introduction of N₂O abatement measures in nitric acid plants that reduce ODS related emissions.

2.2 Legislation and Regulation

ODS substitutes are regulated at both the federal and state level. State regulations build off and fill gaps in federal regulations of these substances requiring a significant level of activity by mandate to reduce ODS emissions.

2.2.1 Federal

Federal regulations, administrated by the Environmental Protection Agency (U.S. EPA), have listed acceptable substitutes for existing refrigerants used in various end-use applications in the refrigeration and air conditioning (including transportation), foam blowing, and fire suppression sectors per the Significant New Alternatives Policy (SNAP).⁶ Under Section 612 of the Clean Air Act (CAA), U.S. EPA's SNAP program reviews substitutes within a comparative risk framework. New final SNAP regulations became effective on May 6, 2021 authorizing new refrigerant options with lower-GWP for retail food cooling as well as residential and light commercial air conditioning and heat pumps.⁷ Section 612 also provides that U.S. EPA must prohibit the use of a substitute where U.S. EPA has determined that there are other available substitutes that pose less overall risk to human health and the environment.⁸

⁵ This includes refrigeration equipment for supermarkets, convenience stores, bakeries, and restaurants and/or stand-alone commercial refrigeration (i.e., refrigerators, freezers, reach-in coolers, and refrigerated food processing and dispensing equipment).

⁶ 40 Code of Federal Regulations (CFR) Part 82.

⁷ U.S. EPA, Final Rule: Protection of Stratospheric Ozone: Listing of Substitutes Under the Significant New Alternatives Policy Program, 40 CFR Part 82 [EPA-HQ-OAR-2019-0698; FRL-10020-41- OAR], Published Federal Register: Vol 86, No. 86, May 6, 2021: <https://www.govinfo.gov/content/pkg/FR-2021-05-06/pdf/2021-08968.pdf>.

⁸ Note that in 2017, the U.S. EPA key HFC prohibitions called Rules 203 and 214 under the SNAP Program were partially vacated by the D.C. Circuit Court of Appeals. In 2018, California incorporated both SNAP Rules 20 and

The Clean Air Act further prohibits the production and use of CFCs in the United States.⁹ Therefore, any ODS substitute project proponent cannot replace an older CFC using a refrigeration system with a new lower-GWP CFC refrigerant system.

Title VI of the Clean Air Act Section 605 is phasing out the allowed use of HCFCs, starting with specific HCFCs and then moving to a total ban subject to limited exceptions.¹⁰ Specifically, beginning January 1, 2020, there is a ban on the production and import of HCFC-22 and HCFC-142b.¹¹ By January 1, 2030, it will be unlawful to produce any HCFCs.¹² Additionally, Title VI of the Clean Air Act Section 608¹³ sets national recycling and emission reduction standards for Class I ODS covered under Sections 604 and Class II ODS covered under Section 605.

On April 30, 2021, the U.S. EPA proposed a HFC phase down regulation for refrigerants and other industrial purposes under an allowance allocation and trading program¹⁴ to implement the recently passed American Innovation and Manufacturing (AIM) Act of 2020, part of the Consolidated Appropriations Act, 2021.¹⁵ The AIM Act requires the U.S. EPA to phase down production and consumption of HFCs in the United States by 85 percent over the next 15 years. If implemented, tradeable allowances would be issued by October 1, 2021 for 2022 to phasedown production and importation of 18 types of HFCs based on the creation of production/consumption baselines, a phasedown schedule, methodology for 2022 and 2023 allowances, and a trading methodology.

2.2.2 State

California set targets to reduce the use of ODS that are high-GWP in nature. The following describes these actions:

- **Refrigerant Management Program** – Pursuant to Assembly Bill 32 (Nunez, Chapter 488, Statutes of 2006), in 2009 California began regulating high-GWP refrigerants from stationary, non-residential refrigerant equipment and from the installation and servicing of stationary refrigerant and air-conditioning appliances using high-GWP refrigerants.¹⁶
- **Senate Bill 1383 (Lara, Chapter 395, Statutes of 2016)** – This bill required a 40 percent reduction of HFC emissions below 2013 levels by 2030.

21—first through adopting an HFC Regulation and then the Legislature enacted the “California Cooling Act” or Senate Bill 1013 (Lara, Chapter 375, Statutes of 2018) (SB 1013).

⁹ Title VI of the Clean Air Act Section 604: 42 United States Code Annotated (U.S.C.A.) § 7671c.

¹⁰ 42 U.S.C.A. § 7671b & d.

¹¹ Ibid.

¹² Ibid.

¹³ 42 U.S.C.A. § 7671g.

¹⁴ See U.S. EPA Proposed Phasedown of Hydrofluorocarbons: Establishing the Allowance Allocation and Trading Program under the American Innovation and Manufacturing Act, 40 CFR Part 82 [EPA-HQ-OAR-2021-0044; FRL-10023-08-OAR], April 30, 2021: https://www.epa.gov/sites/production/files/2021-05/documents/hfc_allocation_nprm_043021_admin.pdf.

¹⁵ See U.S. EPA: Proposed Rule - Phasedown of Hydrofluorocarbons: Establishing the Allowance Allocation and Trading Program under the AIM Act: <https://www.epa.gov/climate-hfcs-reduction/proposed-rule-phasedown-hydrofluorocarbons-establishing-allowance-allocation>.

¹⁶ 17 California Code of Regulations (CCR) § 95380–95398.

- [Senate Bill 1013 \(Lara, Chapter 375, Statutes of 2018\)](#) and [HFC Regulations](#) – California has adopted its own version of the federal regulations by enacting the California Cooling Act (SB 1013 (2018)) and CARB HFC regulation.¹⁷ Together, the regulations are known as California SNAP and cover all end-use specific HFC prohibitions covered by the 2015 Federal SNAP Rules 20 and 21.^{18, 19} In addition, California Code of Regulations Title 17, Section 95374 lists many types of prohibited HFCs.
- [Prohibitions on Use of Certain Hydrofluorocarbons in Stationary Refrigeration, Chillers, Aerosols-Propellants, and Foam End-Uses Regulation \(Adopted\)](#) – CARB has also started or completed rulemakings for further HFC reduction measures per SB 1383 (2016).²⁰ Current activities recently adopted or proposed include the following.
 - [Recently Adopted](#) – CARB has adopted regulations in the Stationary Refrigeration and Air Conditioning rulemaking that seeks to further limit HFC use in air-conditioning, chillers, ice rinks, old storage, and aerosols-propellants by setting GWP limits for new stationary refrigeration and air conditioning units. These regulations would apply to anyone selling, renting, installing, or using any of the applicable equipment. The adopted regulations apply to:
 - New residential and commercial air conditioners in buildings²¹ and set refrigerants GWP limit of 750 starting January 1, 2023;
 - New stationary commercial refrigeration systems containing more than 50 pounds of refrigerant and installed and sold starting January 1, 2022 would be subject to a mandatory GWP limit of 150; and
 - Company-wide emissions reduction targets for companies owning or operating retail food facilities to be met by 2030, with an interim reduction target in 2026 for some companies.²²
 - [Proposed 15-day Changes to Regulation as of January 29, 2021](#) – CARB has made the following proposed changes to the regulation.
 - Establish a refrigerant recovery, recycling, and reuse (R4) program with requirements for use of recycled (i.e., reclaimed) material by manufacturers of air conditioning (A.C.) equipment;

¹⁷ 17 CCR §§ 95371–95377.

¹⁸ California Air Resources Board, [California Significant New Alternatives Policy \(SNAP\)](https://ww2.arb.ca.gov/our-work/programs/california-significant-new-alternatives-policy-snap/about), Last Visited March 24, 2021: <https://ww2.arb.ca.gov/our-work/programs/california-significant-new-alternatives-policy-snap/about> (Note California SNAP does not cover HFC uses in motor vehicle air conditioning (MVAC) systems.);

¹⁹ Note: California SNAP backstopped federal SNAP prohibitions that were curtailed by *Mexichem Fluor. v. U.S. EPA* (D.C. Cir. 2017), 866 F.3d 451 (Rehearing En Banc Denied January 26, 2018) by codifying Rule 20 and 21 as they existed prior to this decision.

²⁰ See California Air Resources Board, [Prohibitions on Use of Certain Hydrofluorocarbons in Stationary Refrigeration, Chillers, Aerosols-Propellants, and Foam End-Uses Regulation](https://ww2.arb.ca.gov/rulemaking/2020/hfc2020), Last Visited March 23, 2021: <https://ww2.arb.ca.gov/rulemaking/2020/hfc2020>.

²¹ Applies to: new smaller AC and heat pump equipment including: Dehumidifiers, room/wall/window AC equipment, packaged terminal ACs (PTACs), packaged terminal heat pumps (PTHPs), and portable AC equipment.

²² California Air Resources Board, [Proposed Regulation Order, 17 CCR § 95375\(d\)\(4\)](https://ww3.arb.ca.gov/regact/2020/hfc2020/appa.pdf?_ga=2.74756370.1298518678.1610049529-1514940210.1609783083), 2020: https://ww3.arb.ca.gov/regact/2020/hfc2020/appa.pdf?_ga=2.74756370.1298518678.1610049529-1514940210.1609783083.

- For new A.C. systems (not already included in the smaller A.C. and heat pump list above), delay the 750 GWP limit requirements from January 1, 2023, to January 1, 2025;
- For new variable refrigerant flow (VRF) and variable refrigerant volume (VRV) systems, delay the 750 GWP limit requirements from January 1, 2023 to January 1, 2026; and
- Establish reclaimed refrigerant use requirements for original equipment manufacturers of new A.C. and VRF/VRV units using a refrigerant with a GWP of 750 or greater in California.^{23, 24}
- **Transportation** – Phase-Out of CFC Refrigerants in New Motor Vehicle Air Conditioning (MVAC) Systems from Model Year (MY) 1993 and Subsequent Years—13 CCR Section 2500: Regulation to phase-out the use of CFC refrigerants in new MVAC systems with only 10% of vehicles starting in MY 1993 being allowed the use of CFC refrigerants.
- **Small Can Motor Vehicle A.C. Refrigerant Regulation** – 17 CCR Sections 95360–95370: small containers of automotive refrigerant must be certified for use and sale by CARB and creates a container deposit and return program to dispose of the containers in a way to reduce emissions and applies to any person who sells, supplies, offers for sale, advertises, manufactures for sale, recycles, reclaims, recovers, imports, exports, or introduces into commerce in California any automotive refrigerant intended for use in motor vehicle A.C. systems.

2.3 Protocols

EPIC identified 36 protocols related to activities to reduce or eliminate ODS emissions; 10 protocols are active and applicable (Table 4). These activities include ODS destruction, substitution, and reclamation and abatement. The CARB compliance protocol for ODS activities is operated by all three carbon offset credit programs. Protocols in this category can be further sorted into three categories. Activities to reduce GHG emissions within each of these categories are similar across the identified protocols.

- **ODS Destruction** – These activities focus on the destruction of high-GWP ODS to prevent their release into the atmosphere. The ODS targeted for destruction include foam blowing agents and refrigerants. All ODS destruction must be fully documented, chemically analyzed, and destroyed at a qualified facility.

²³ California Air Resources Board, 15-Day Notice of Change to Regulation: Prohibitions on Use of Certain Hydrofluorocarbons in Stationary Refrigeration, Chillers, Aerosols-Propellants, and Foam End-Uses Regulation: https://ww3.arb.ca.gov/regact/2020/hfc2020/appa.pdf?_ga=2.179036708.1445906861.1608245510-1734849904.1605635696&utm_medium=email&utm_source=govdelivery (proposed regulation) & https://ww2.arb.ca.gov/rulemaking/2020/hfc2020?utm_medium=email&utm_source=govdelivery (Rulemaking); Note: This regulatory has taken public comment but has not moved to the next stage of CARB formal adoption and submission to OAL.

²⁴ Note: On May 13, 2021, CARB introduced another 15-Day Notice to Change to Regulation: Prohibitions on Use of Certain Hydrofluorocarbons in Stationary Refrigeration, Chillers, Aerosols-Propellants, and Foam End-Uses Regulation that address definition changes and implementation updates: https://www.arb.ca.gov/regact/2020/hfc2020/15daynotice.pdf?_ga=2.24276858.1147249389.1621464747-1044761720.1621464747.

- **ODS Substitute** – Substitution activities trace their lineage from bans that required the replacing of CFCs with HCFCs and HCFCs with HFCs. HFCs have high-GWP and these activities seek to replace HFCs with alternatives that exhibit low- or no GWP as new refrigerant systems are manufactured and installed. These alternatives include: hydrocarbons, ammonia, carbon dioxide, and hydrofluoroolefins (HFOs). Some are complete replacements, while other refrigeration systems use a combination of HFCs and alternatives. Additionally, substitution activity includes use of other gases for magnesium production as well as substitution of advanced blowing agents for foam production.
- **ODS Reclamation and Abatement** – This category of activity focuses on reclaiming HFCs to prevent them from being released into the atmosphere. These activities also divide reclamation into methodologies for advanced refrigeration systems and general HFC reclamation. These activities also include leak detection of refrigeration systems where efficiencies are gained through real-time infrared leak detection.

Almost 90% of all projects identified in the Industrial Processes and Product Use category are related to ODS. About 70% of ODS-related projects use CARB compliance protocols. The vast majority of related projects that are located in the U.S. but outside California, with only two located in the state and none in the San Diego region.

Table 4 Projects Related to Protocols for Ozone Depleting Substance

GHG Reduction Activity/Protocol	US	CA	San Diego Region
ODS Destruction	212	2	0
CAR Ozone Depleting Substances	35	0	0
ACR Ozone Depleting Substances Compliance Offset Protocol (CARB)	95	0	0
CAR Ozone Depleting Substances Compliance Offset Protocol (CARB)	82	2	0
ACR Destruction of Ozone Depleting Substances and High-GWP Foam	0	0	0
VCS Ozone Depleting Substances Compliance Offset Protocol (CARB)	0	0	0
VCS VM0016 Recovery and Destruction of Ozone-Depleting Substances (ODS) from Products, v1.1	0	0	0
ODS Substitutes	31	0	0
ACR Advanced Refrigeration Systems	3	0	0
ACR Transition to Advanced Formulation Blowing Agents in Foam Manufacturing and Use	28	0	0
ODS Reclamation and Abatement	1	0	0
ACR Certified Reclaimed HFC Refrigerants	0	0	0
VCS VM0001 Infrared Automatic Refrigerant Leak Detection Efficiency Project Methodology (not HFC-23)	1	0	0
Total	244	2	0

VCS excludes projects in non-Least Developed Countries, including the U.S., because these activities are considered financially competitive, no longer need carbon finance, and raise concerns about additionality. In the Industrial Processes and Product Use category, VCS excludes large- and

small-scale activities that reduce hydrofluorocarbon-23 (HFC-23) emissions.^{25,26} As a result, the VCS Protocols VM0001 would not be applicable for projects related to HFC-23.

2.4 Additionality

This section evaluates whether the protocols listed above or similar activities would lead to GHG reductions that would not have occurred otherwise. In the context of offset credits, it is important to determine whether a project and associated GHG reductions or removals would have happened in the absence of any benefit derived from creating an offset credit; that is, whether the reduction or removal is in addition to what would have otherwise happened. Additionality is a defining characteristic of offset credits and there are several different ways to determine, or test, whether a project is additional.

California regulation defines “additional” to mean “greenhouse gas emission reductions or removals that exceed any greenhouse gas reduction or removals otherwise required by law, regulation or legally binding mandate, and that exceed any greenhouse gas reductions or removals that would otherwise occur in a conservative business-as-usual scenario.”²⁷ This definition creates a two-part test of additionality: a legal requirement test and a common practice test (sometimes called performance test). Even though this test is developed in the context of CARB’s compliance offsets, it is similar to that used by offset credit programs, and thus can serve as a reasonable framework to evaluate whether offset credit protocols and resulting GHG emission reductions or removals would be considered additional.

Additionality must be determined on a project-by-project basis. For our purposes here we consider a preliminary screen of protocols and project types (e.g., destruction of ODS) to determine whether as a group they could be considered additional. The additionality determination provided here is intended as a preliminary determination and specific additionality screening would have to be applied to a specific project to determine whether the associated GHG reductions or removals are additional.

A more detailed discussion of additionality is provided in Section 2.3 of the main report.

²⁵ Verified Carbon Standard: A VERRA STANDARD, VCS Standard, Version 4.0., 2019, p. 2–3: https://verra.org/wp-content/uploads/2019/09/VCS_Standard_v4.0.pdf.

²⁶ Small-scale and large-scale project scale is determined using the UNFCCC Clean Development Mechanism (CDM) definitions.

²⁷ 17 CCR § 95802(a) (“Additional” definition).

Additionality Tests

There are several different tests to determine additionality. This report uses two common tests.

- **Legal Requirement Test** – This test determines whether there are any laws, regulations, policies, or legally-binding mandates that would have required the activity. If the activity does not exceed requirements, related emissions reductions would fail the legal requirement test and be considered not additional.
- **Common Practice Test** – This test determines whether in the absence of a requirement the activity would have happened anyway due to technological, financial, or other considerations. For example, if the activity is cost effective without the proceeds from carbon offset credits or represents a common practice, it could be considered not additional.

2.4.1 Legal Requirements Test

Federal SNAP regulations and the Clean Air Act prohibit the use of certain types of ODS and also list acceptable alternatives. The list of alternatives changes over time as U.S. EPA makes determinations about the overall impact of the specific ODS on the environment and human health. Consequently, many ODS are banned or may be banned in the future as substitutes are developed and implemented. Currently, SNAP regulations classify this decision making in the following way.

- **Acceptable** substitutes are determined to reduce overall risk to human health and the environment compared to other substitutes for the particular end-use. These alternatives may be used without restriction in the specified end-uses.
- **Acceptable subject to use conditions** indicates that a substitute is acceptable only if used in a certain way. For example, substitutes in motor vehicle air conditioning systems are acceptable subject to a use condition that the substitute be used with unique equipment fittings on the system (for servicing) and on refrigerant containers.
- **Acceptable subject to narrowed use limits** indicates that a substitute may be used only within certain specialized applications within a sector and end-use, and may not be used for other applications within an end-use or sector. The U.S. EPA requires a user of a narrowed use substitute to demonstrate that no other acceptable substitutes are available for their specific application.
- **Unacceptable alternatives** are prohibited because the Administration has determined the use of the substitutes pose significantly higher human health and environmental risks than those risks from use of other available or potentially available substitutes.²⁸

Where an ODS is already banned, where a substitute is already required, or where an ODS may be banned in the future with the development of a substitute, a project would be considered not additional because of this federal regulation.

²⁸ See United States Environmental Protection Agency, Significant New Alternatives Policy (SNAP), Overview of SNAP, last visited March 23, 2021: <https://www.epa.gov/snap/overview-snap>.

California Cooling Act (SB 1013 (2018)) and CARB HFC regulation, known as “California SNAP,” further regulate these substances. These regulations cover all end-use specific HFC prohibitions covered by the Federal SNAP regulations.²⁹ California Code of Regulations Title 17, Section 95374 lists many types of prohibited HFCs. California is also in the process of further regulating these types of substances either through a required substitute or ban under its Stationary Refrigeration and Air Conditioning rulemaking.

Because this proposed regulation applies to new refrigeration and air conditioning, it leaves open the ability to substitute or destroy existing ODS currently in use. Additionally, existing regulation leaves open the opportunity to substitute or destroy existing ODS uses in the built environment. Finally, reclamation of ODS is viable but only if the ODS is not currently required to be substituted with a less detrimental substance.

2.4.2 Common Practice Test

A project that passes the legal requirement test may be considered not additional for other reasons. The Common Practice Test, also sometimes called the Performance Test, is an industry or sector specific analysis that requires the individual project to either achieve emission reductions in excess of what would have occurred otherwise based on whether there is widespread deployment of the particular project, technology, or practice or whether there is performance achievement that is greater than average within a relevant geographical area.³⁰ This determines what is a common practice in the geographical region. A project-by-project analysis of what is a common practice to determine whether the applicable project would pass the common practice test was beyond the scope of this document for the San Diego Region. However, the following discusses general considerations.

Because many ODS are required to be substituted, or their use is banned, there is significant regulation that signals that existing regulations form or will form in the near future a common practice where there are limited reduction opportunities for new applications. However, where there are existing ODS substitute uses that a project proponent can either destroy, substitute, or reclaim, there may be opportunity to reduce ODS emissions. Where opportunities exist, the project must show that its activity is in fact additional to the common practice in the region.

VCS’s exclusion is also relevant to mention here again as a reflection of the common practice in non-Least Developed Countries. VCS excludes projects in non-Least Developed Countries, including the U.S., because these activities are considered financially competitive, no longer need carbon finance, and raise concerns about additionality. In the Industrial Processes and Product Use

²⁹ California Air Resources Board, California Significant New Alternatives Policy (SNAP), last visited March 23, 2021: <https://ww2.arb.ca.gov/our-work/programs/california-significant-new-alternatives-policy-snap/about> (California SNAP does not cover HFC uses in motor vehicle air conditioning (MVAC) systems.).

³⁰ See America Carbon Registry, THE AMERICAN CARBON REGISTRY STANDARD: REQUIREMENTS AND SPECIFICATIONS FOR THE QUANTIFICATION, MONITORING, REPORTING, VERIFICATION, AND REGISTRATION OF PROJECT-BASED GHG EMISSIONS REDUCTIONS AND REMOVALS, Version 7.0, 2020, p. 27–28: https://americancarbonregistry.org/carbon-accounting/standards-methodologies/american-carbon-registry-standard/acr-standard-v7-0_final_dec2020.pdf.

category, VCS excludes large- and small-scale activities that reduce hydrofluorocarbon-23 (HFC-23) emissions.^{31,32} This further limits offset project development in the San Diego region.

2.5 Other Considerations

Regulation of ODS and other high-GWP gases are a moving target with more regulation and incentives likely to come from the Biden Administration as well as from the State of California (See Section 2.2 above). This will further decrease the viability of GHG reduction opportunities or change the period during which the regulation will be effective (e.g., changing regulations effective date from 2023 to 2025) from this sector over time.

For example, alternative ODS substitutes are being actively funded through incentive programs. CARB offers a \$1 million Fluorinated Gases Emission Reduction Incentive Program, also called the F-gas Reduction Incentive Program (FRIP),³³ that recently went through a solicitation and published notice of proposed award (NOPA) that allocates all available incentives to eighteen applicants.³⁴ FRIP is funded under the 2019–2020 budget (Assembly Bill 74 (Ting, Chapter 23, Statutes of 2019), Budget Act of 2019) in which CARB received \$1 million to reduce emissions from the use of fluorinated refrigerants as directed by SB 1013 (2018). That law established the FRIP, to be administered by CARB, to promote the adoption of new refrigerant technologies to achieve short- and long-term climate benefits, energy efficiency, and other co-benefits, as specified. The bill authorizes moneys from the Greenhouse Gas Reduction Fund to be allocated for incentives offered as part of the program. The proposed awards will fund sixteen Tier I projects (ultra-low GWP systems) and two Tier II projects (refrigerant retrofits).³⁵ This state level activity both decreases the available projects for ODS substitution emission reductions and also demonstrates a viable approach to identify and further reduce emissions from these sources that would be beyond the SB 1383 (2016) requirements.

Additionally, pursuant to Assembly Bill 398 (Eduardo Garcia, Chapter 135, Statutes of 2017), CARB's Compliance Offset Protocol Task Force published a Final Recommendations report on March 2, 2021, for changes to the existing Cap-and-Trade offset program. The Task Force is mandated to provide guidance to CARB in establishing new offset protocols for the Cap-and-Trade Program with direct environmental benefits in the state while prioritizing disadvantaged communities, Native American or tribal lands, and rural and agricultural regions. The Task Force will aid CARB in identifying potential new Compliance Offset Protocols for the Cap-and-Trade Program to generate compliance offset credits available for compliance use from 2021 through 2030, and

³¹ Verified Carbon Standard: A VERRA STANDARD, VCS Standard, Version 4.0., 2019, p. 2–3: https://verra.org/wp-content/uploads/2019/09/VCS_Standard_v4.0.pdf.

³² Small-scale and large-scale project scale is determined using the UNFCCC Clean Development Mechanism (CDM) definitions.

³³ California Air Resources Board, F-gas Reduction Incentive Program, Last Visited March 23, 2021: <https://ww2.arb.ca.gov/our-work/programs/FRIP/about>.

³⁴ California Air Resources Board, New CARB investment program awards first \$1 million for large, cutting-edge refrigeration systems, January 21, 2021: <https://ww2.arb.ca.gov/news/new-carb-investment-program-awards-first-1-million-large-cutting-edge-refrigeration-systems>.

³⁵ California Air Resources Board, F-gas Program Awarded Projects, Last Visited March 23, 2021: <https://ww2.arb.ca.gov/our-work/programs/FRIP/frip-program-awarded-projects>.

specifically, protocols that have direct environmental benefits in California. The March 2021 Compliance Offset Protocol Task Force Final Recommendations report makes the following relevant recommendations:

- Add R-22 (and other common HCFCs possibly including R-134a, R-125, R-32, and R-143a) to the list of eligible refrigerant ODS;
- Evaluate whether halons should be added to the list of eligible refrigerant ODS;
- Restrict the liability to have offset credits disqualified or discounted if the ODS destruction facility is not meeting regulatory compliance only for non-compliance events directly impacting ODS handling and destruction and emissions from ODS processing (such as system residence time, temperature, emissions source testing), and not to non-compliance events that have no impact on ODS processing;
- Review, document, and update as appropriate the ODS “10-year Cumulative Emission Rate” (10-year lifecycle loss factors) of Appendix B, Table B-1;
- For ODS foam, change the baseline from the existing protocol which assumes long term disposal in landfill (with very little loss to the atmosphere) to what is the current practice of recovery and reuse (with much higher rate of loss to the atmosphere);
- Review and update as appropriate GWP factors for refrigerants and refrigerant substitutes;
- Allow ODS sourced from the federal government as eligible; and
- Review the current ACR ODS protocol which includes numerous corrections and additions to the existing CARB protocol, including a significantly revised foam handling procedure, but not adding halons.³⁶

These recommendations will go to the CARB Board for discussion. It is not known at this time if any action will be taken in this regard.

Finally, most local Climate Action Plan (CAP) inventories do not include industrial emissions. Only regional and statewide emission inventories include industrial emissions.³⁷ Consequently, mitigation for industrial emissions is not included in local government CAP GHG mitigation strategies and measures. This further opens the possibility that industrial emissions will not be regulated at the local level and can therefore be used as offsets or for other direct reduction projects to reduce emissions.

2.6 Summary of GHG Opportunities

Federal and California law regulates the use and substitution of ODS. ODS substitutes have high GWP and in many cases destruction, reclamation, or reuse is considered additional but must comply with existing Federal and California regulations. Many ODS substitutes are prohibited for production and consumption under federal and California requirements; these requirements generally only affect new equipment.

³⁶ California Air Resources Board, Compliance Offsets Protocol Task Force Final Recommendations, 2021, p. 187–189: https://ww2.arb.ca.gov/sites/default/files/2021-03/offsets_task_force_final_report_030221.pdf.

³⁷ See: SANDAG San Diego County Greenhouse Gase Inventory: A Summary of Methods Used, March 2009: https://www.sandag.org/uploads/projectid/projectid_374_13259.pdf.

Most opportunities for offset credits would result from destroying, reclaiming, or substituting with low- or no GWP alternatives that are in addition to existing ODS bans and mandatory substitutions in existing equipment. This also affords other opportunities, such as the implementation of advanced refrigeration technology, that use low- or no GWP substitutes where these types of technologies are both not mandated, and where the low- or no GWP substitutes are not part of the existing federal and state regulations.

More specifically, Title VI of the Clean Air Act Sections 604 and 605 phase-out the production and consumption of Class I and Class II substances (including eligible ODS and high-GWP foams under these protocols), but these requirements do not require the destruction, reclamation, or abatement of the eligible substances. The Clean Air Act does regulate how these prohibited substances must be stored, are reused (after recycling and reclamation), or are destroyed. Therefore, the destruction, reclamation, or abatement can reduce emissions as long as the destruction requirements under Part 608 of Title VI of the Clean Air Act are met.

Emission reduction and removals from the Destruction of Ozone Depleting Substances and High-GWP Foam are another regulated activity. 17 CCR Section 95374 lists many types of foam in the prohibited substances table.³⁸ Since specific types of HFCs are prohibited under CCR, a transition from a blowing agent containing one or more listed HFCs to an agent that did not contain a listed HFC would not be considered additional since the chemical is already regulated and prohibited by law. While there are some prohibited blowing agents, there are no regulations in place mandating the transition away from blowing agents containing chemicals that contribute to global warming by releasing GHGs during manufacture, use, and end-of-life to blowing agents with lower high global warming potential and lower ozone depleting potential. If a project were to overcome the technical and financial barrier of using low global warming potential blowing agent options, the project could be considered additional.

Projects applicable in the San Diego region under offset credit protocols include:

- Reclamation and use of certified reclaimed HFC refrigerants to service existing refrigeration and air conditioning equipment;
- Reclamation and use of certified reclaimed HFC refrigerants in newly manufactured refrigeration or air conditioning equipment;
- Transition to low-GWP blowing agents in foam manufacturing;
- Recycling transformer oil used in transformers that are operated by electric utility customers and large industrial companies;
- Destruction of ODS in industrial, commercial, and residential refrigerants and appliance and building foams;
- Destroying eligible ODS, high-GWP foam blowing agents, or high-GWP insulation foam at a single qualifying destruction facility; and
- Transitioning to advanced refrigeration systems using U.S. EPA SNAP approved low-GWP refrigerant in the large commercial refrigeration sector where the equipment has an initial

³⁸ California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4 (Types of polyurethane foams containing HFC-134a, HFC-245a, HFC-365mfc, Formacel TI, and Formacel Z-6 are prohibited as of January 1, 2019.).

charge of 50 pounds or more of refrigerant (i.e., supermarkets, convenience stores, bakeries, and restaurants) and/or stand-alone commercial refrigeration (i.e., refrigerators, freezers, reach-in coolers, and refrigerated food processing and dispensing equipment) that are CFC, HCFC, or HFC based.³⁹

Based on the analysis here, all active protocols that cover activities applicable to the San Diego region would be considered additional (Table 5).

Table 5 Summary of Additionality Determination for ODS Related Protocols

GHG Reduction Activity/Protocol	Additionality Determination
ACR Ozone Depleting Substances Compliance Offset Protocol (CARB)	Additional
CAR Ozone Depleting Substances Compliance Offset Protocol (CARB)	Additional
CAR Ozone Depleting Substances	Additional
ACR Transition to Advanced Formulation Blowing Agents in Foam Manufacturing and Use	Additional
ACR Advanced Refrigeration Systems	Likely Additional
VCS VM0001 Infrared Automatic Refrigerant Leak Detection Efficiency Project Methodology (not HFC-23)	Additional
ACR Certified Reclaimed HFC Refrigerants	Likely Additional
ACR Destruction of Ozone Depleting Substances and High-GWP Foam	Additional
VCS Ozone Depleting Substances Compliance Offset Protocol (CARB)	Additional
VCS VM0016 Recovery and Destruction of Ozone-Depleting Substances (ODS) from Products, v1.1	Additional

³⁹ Note EPIC is unable to confirm the regional existence of these industries, but reductions would require: 1) replacing Sulfur Hexafluoride in full or in part with another covered gas in the magnesium metal casting industry; 2) introduction of N₂O abatement measures in nitric acid plants.

3 OTHER FUGITIVE AND PROCESS EMISSIONS

This section includes emissions from fugitive solvent use, industrial CO₂ consumption, soda ash consumption, and dolomite consumption, and lubricant emissions related to fuel use (Table 6). This section describes methods to reduce emissions, regulations related to these activities, related protocols, additionality related findings, other considerations, and a summary of GHG opportunities.

Table 6 Emissions from Other Fugitive and Process Emissions

Emissions Subcategories
Transportation lubricant use (fuel consumption)
Industrial lubricant use (fuel consumption)
Fugitive emissions from solvent use
Industrial CO ₂ consumption
Industrial soda ash consumption
Industrial dolomite consumption

3.1 Methods to Reduce Emissions

The main ways to reduce emissions from fugitive and processes emissions are to destroy emissions from solvents, substitute solvents with lower-GWP solvents, stop leakage from industrial CO₂ consumption, reduce industrial CO₂ consumption, reduce dolomite consumption, reduce soda ash consumption, decrease industrial and transportation fuel and lubricant consumption, and re-refine lubricants used in industrial lubrication and transportation. These processes reduce emissions by avoiding the release of high-GWP emissions or decreasing the leakage or release of emissions related to industrial processes.

3.2 Legislation and Regulation

The following discusses state regulation of fugitive and process emissions and lubricant emission. Federal regulation is omitted here because there is no direct federal regulation of these activities related to GHG emissions.

3.2.1 Fugitive and Process Emissions Management

California's Cap-and-Trade program regulates covered entities that include glass production and other stationary combustion that emit 25,000 metric tons or more of CO₂e per data year.⁴⁰ These entities are regulated because of the fugitive and process emissions that occur in their operations. Glass production includes both container glass pulled and flat glass pulled with glass production

⁴⁰ Note that the California Cap-and-Trade also regulate lead, nitric acid, and lime production. These are omitted because there are no activities from these facilities in the region and therefore no emissions from these activities.

considered a high leakage risk classification.⁴¹ Stationary combustion regulation is defined by vented emissions where there is an intentional or a designed release of CH₄ or CO₂ containing natural gas or hydrocarbon gas (not including stationary combustion flue gas), including process designed flow to the atmosphere through seals or vent pipes, equipment blowdown for maintenance, and direct venting of gas used to power equipment (such as pneumatic devices).⁴² These facilities are regulated by allowance per short ton.

A covered facility's compliance obligation is equivalent to the quantity of allowances or a limited number of CARB offset credits a facility is required to surrender to CARB by a specified deadline to comply with the Cap-and-Trade program. Each facility's compliance obligation will be determined by the quantity of reported and verified GHG emissions. CARB will directly allocate a proportion of allowances to qualified facilities subject to the program. Each facility will be responsible for acquiring the remaining allowances or limited number of offset credits to comply with the program.

Beyond the Cap-and-Trade program, GHG emissions standards are set for crude oil and natural gas facilities. 17 CCR § 95666 (a) applies these standards to owners or operators of equipment and components listed in 17 CCR § 95668 located within California, including California waters, that are associated with facilities in the following sectors, regardless of emissions level:

- Onshore and offshore crude oil or natural gas production; and,
- Crude oil, condensate, and produced water separation and storage; and,
- Natural gas underground storage; and,
- Natural gas gathering and boosting stations; and,
- Natural gas processing plants; and,
- Natural gas transmission compressor stations.

17 CCR § 95666 sets standards and exemptions for each type of equipment to both control emissions and eliminate leakage of GHG gases. Air Districts are not preempted from creating more stringent requirements under 17 CCR § 95676.

3.2.2 Lubricant Management

Recycling of oil is not mandated by the State of California or federal government, but used oil is considered hazardous waste and highly regulated if not re-refined. California does regulate re-refined oil through labeling, testing, transportation, oil recyclers, transfer facilities, and reporting requirements.⁴³ California encourages the recycling of oil in many ways and actively discourages the disposal of oil outside of designated recycling facilities.⁴⁴

The Federal Trade Commission sets Testing and Labeling standards for recycled oil under the Test Procedures and Labeling Standard for Recycled Oil.⁴⁵ Where oil does not meet these standards, it is considered hazardous waste and must be disposed of according to state regulation.

⁴¹ 17 CCR § 95802; see 17 CCR § 95870 Table 8-1.

⁴² 17 CCR § 95802 (Stationary Combustion and "Vented Emissions" definition).

⁴³ See Assembly Bill 546 (Lowenthal, Chapter 353, Statutes of 2009).

⁴⁴ See Used Oil Management: California Health & Safety Code, §§ 25250.1–25250.25; Used Oil Recycling Enhancement Act: California Public Resources Code, §§ 48600 et seq.

⁴⁵ 16 CFR Part 311.

3.3 Protocols

EPIC identified three protocols related to fugitive and process emission; two active and applicable protocols focus on activities to re-refine used lubrication oil and recycle transformer oil (Table 7). These protocols appear to reflect the existing opportunity to re-refine lubrication oils and signify that existing protocols are not used for other fugitive emissions or industrial processes. The use of these protocols is limited to four projects in the U.S. There are no related projects in California.

Table 7 Protocols Related to Fugitive and Process Emissions Management

GHG Reduction Activity/Protocol	San Diego		
	US	CA	Region
Fugitive and Process Emissions Management	4	0	0
ACR Re-refining Used Lubricating Oils	3	0	0
ACR Recycling of Transformer Oil	1	0	0

3.4 Additionality

This section evaluates whether the protocols listed above or similar activities would lead to GHG reductions that would not have occurred otherwise. A brief discussion of additionality is provided in Section 2.4.

3.4.1 Legal Requirement Test

Solvents do not appear to be regulated directly for fugitive or process emissions at either the federal, state, or local level. Where the solvent may fall under the ODS substitute regulations, there may exist current requirements that limit additionality.

Glass production and other stationary combustion that emit 25,000 metric tons or more of CO_{2e} per data year are regulated under California's Cap-and-Trade program. Facilities that emit less than 25,000 metric tons are not regulated and offer potential emission reduction opportunities.

Crude oil and natural gas facilities regulated under 17 CCR § 95666 must meet specified standards. Where these standards can be exceeded or where a facility is exempt, an opportunity exists to further reduce the emissions from these facilities. These reductions may be subject to future San Diego Air Quality Management District (SDAQMD) regulations.

Finally, while lubricants used in industrial and transportation are not directly required to be re-refined, the regulation that treats lubricants as hazardous waste subject to strict requirements likely serves to cause most lubricants to be re-refined. Where the emissions are from industrial and transportation fuel consumption, better fuel efficiency and engine emission requirements will decrease these emissions.

3.4.2 Common Practice Test

An emission reduction project must evaluate whether common practices, as described in Section 2.4.2, would eliminate the additionality of the activity. In this case, the common practice in the region would capture all existing emission reduction activities commonly practiced for industrial process inputs and common use of lubricants. Economic feasibility appears to be highly

determinative because of existing common practices and lack of alternatives that may further reduce emissions for these activities.

3.5 Summary of GHG Opportunities

Based on the analysis here, all active and applicable protocols would be considered additional. Fugitive and other process emissions are generally created as a result of the industrial process itself or through the consumption of an input (e.g., soda ash for glass making). These facilities are regulated if they emit above the Cap-and-Trade Program threshold. Where a facility is not directly regulated or where the emission is not directly regulated (e.g., regulation of lubricants in industrial and transportation fuel consumption), an opportunity exists to decrease emissions.

Some activities included in projects applicable to the industrial sector are covered under California Cap-and-Trade Program emissions standards. For example, Cap-and-Trade Program regulations require nitric acid facilities, glass production, and stationary exhaust facilities that emit 25,000 tons or more of CO₂e per data year to participate in the Cap-and-Trade Program. While there are no laws or regulations that require a change in the emission causing input (e.g., soda ash, dolomite, or N₂O abatement measures in nitric acid production), there are emissions standards that the project activity is required to meet. To be considered additional, the abatement technology must not be used to meet these emissions requirements and must cause the emissions reductions to go beyond the emissions standards required by law and regulation. Where a facility emits below the Cap-and-Trade Program emission threshold, emission reductions would be considered additional.

Emissions reductions where lubricant emissions can be reduced either directly or through the re-refining of used lubricating oil, is possible to avoid GHG emission associated with the combustion of lubricants during and recycling at end of life. There are no federal or state regulations requiring use of re-refined lubricating oil. However, if oil is to be recycled, the recycler must follow federal regulations that have set guidelines for the test procedures and the labeling standards for recycled oil.⁴⁶ A project under this methodology would be considered additional but the project lead must be aware and comply with any regulations in connection with the activity.⁴⁷

Because there is direct regulation under Cap-and-Trade, direct regulation of emissions from oil and gas facilities, and indirect regulation of lubricant oils, the legal and common practice scenario appears to offer limited opportunity. Opportunities may exist where Cap-and-Trade does not apply to a facility or where there is an opportunity to increase emission reductions beyond existing requirements or the existing common practice. The lack of direct regulation of solvents also creates an opportunity for further evaluation as to common practice to determine reduction activity.

Many questions remain, including how to decrease inputs from soda ash, dolomite, and other required inputs for industrial processes where the process requires such inputs and substitutes do

⁴⁶ Ibid.

⁴⁷ The same regulation requirements can be seen in the Recycling of Transformer Oil protocol. Recycling used transformer oil used in transformers that are operated by electric utility customers and large industrial companies that would otherwise be combusted is considered additional as long as the oil meets the requirements of recycled oil under California Health & Safety Code § 25250.4.

not exist. This issue also exists for decreasing emissions from solvents where substitutes may not exist.

To summarize, there are opportunities for offset credits projects in the San Diego region that can be considered additional. However, many of the activities are adjacently regulated by local, state, or federal regulations requiring the emission activity to follow these requirements (e.g., re-refine oil).

4 OTHER EMISSIONS

Remaining emissions include those from SF₆ losses from the electricity grid and high-GWP gases in semiconductor manufacturing. This section provides a condensed summary due to the limited reductions and information found. Additional research would be needed to determine the feasibility and scope of any opportunities discussed here.

Currently, there are no relevant protocols related to these emission sources. Protocol related to SF₆ reduction in the magnesium industry were excluded because there are no emissions related to this in this activity in the San Diego region and both ACR and VCS related protocols are inactive.

Methods to reduce these emissions include decreasing the gases used in these other industrial processes. Specifically, 17 CCR §§ 95320–95326 requires GHG emission reductions in semiconductors and related devices regulation. These reductions reduce fluorinated gas emissions from semiconductors or related devices that use fluorinated gases or heat transfer fluids. To meet the Legal Requirement Test, semiconductor manufacturing regulation under Title 17, which sets standards for reducing emissions from this source, requires any activity to achieve additional emission reductions beyond these requirements. Also, SF₆ is not regulated to reduce emissions from electricity transmission. Any reduction would be considered additional.

Because there is direct regulation of semiconductor production, the common practice appears to result in limited additional emissions reduction opportunities. Opportunities may exist where SF₆ emissions can be reduced beyond existing baselines.

There is likely limited additional emission reduction for semiconductor manufacturing because of existing direct regulation. Any emission from semiconductor manufacturing would need to be in addition to the existing requirements. SF₆ emission reductions are possible but represent a very small amount of current emissions.

5 CONCLUSION

Emissions from the Industrial Processes and Product Use account for approximately 4% of total regional emissions. Of this, ODS substitutes represent about 80% of emissions. Because the ODS and substitutes are high-GWP gases, small quantities of gas represent a large quantity of emissions on a CO₂e basis. This can make activities to destroy, reclaim, or recycle ODS desirable. However, regulation of ODS substitutes is transitioning to address the high-GWP of ODS substitutes in addition to ozone impacts, resulting in new proposed regulations.

Because ODS accounts for the largest percentage of emissions in this category, most regulations and protocols related to Industrial Processes and Product Use are related to ODS management. Of these activities, most emission reduction projects are associated with the CARB compliance market. Overall, ODS substitutes are regulated at the federal and state level resulting in opportunity to destroy, reclaim, or otherwise abate existing uses of ODS substitutes as well as using low- or no GWP substitutes in new equipment.

Fugitive emissions and industrial processes are subject to CARB's Cap-and-Trade program, which affects fugitive emissions from glass production and stationary combustion in the San Diego region. Other emissions that include SF₆ from electricity transmission and semiconductor manufacturing offer limited opportunity because there are little emissions or it is already significantly regulated, respectively.

The following describes potential opportunities for offset credits in this category:

- ODS Substitutes: Destruction, substitution to low- or no GWP alternatives for new or replacement equipment, and reclaiming and abatement of ODS substitutes;
- Lubricants:
 - Improvement in fuel consumption that cause emissions from industrial and transportation lubricants;
 - Collection and re-refining of lubricant oil that would not otherwise be re-refined;
- Industrial Process Inputs:
 - Emission reduction related to glass production and stationary combustion facilities that are outside of the Cap-and-Trade program; and
 - Emission reduction through substitution of low- or no GWP solvents.