

UPDATED INFORMATIVE DIGEST

Adoption of a Regulation for the Management of High Global Warming Potential Refrigerants for Stationary Sources

Sections Affected: This action adopts new subarticle 5, Management of High Global Warming Potential Refrigerants for Stationary Sources, Title 17, California Code of Regulations (CCR) sections 95380, 95381, 95382, 95383, 95384, 95385, 95386, 95387, 95388, 95389, 95390, 95391, 95392, 95393, 95394, 95395, 95396, 95397, and 95398.

Background: The California Global Warming Solutions Act of 2006 (Assembly Bill 32 (AB 32); Stats. 2006, Chapter 488) created a comprehensive, multi-year program to reduce greenhouse gas (GHG) emissions in California. ARB staff proposed a regulation that would reduce GHG emissions associated with stationary, non-residential refrigeration equipment and resulting from the installation and servicing of refrigeration and air-conditioning (R/AC) appliances.

While not a discrete sector of the California economy, the high-global warming potential (GWP) GHG sector consists of a broad range of sources that emit gases with hundreds to thousands of times the climate impact of carbon dioxide (CO₂) on an equal mass basis. High-GWP refrigerants serve an important purpose as refrigerants in stationary heating, ventilation, and air conditioning (HVAC), mobile vehicle air conditioning (MVAC), and refrigeration. High-GWP gases are also used as foam-blowing agents, in electrical transmission, as fire suppressants, in consumer products, and in the semiconductor industry.

For the purposes of the adopted regulation, high-GWP refrigerants include: 1) any refrigerant with a GWP value equal to or greater than 150, or 2) any refrigerant that is an ozone depleting substance (ODS). High-GWP refrigerants include chlorofluorocarbons (CFC), hydrochlorofluorocarbons (HCFC), hydrofluorocarbons (HFC), and perfluorocarbons (PFC). CFC and HCFC are classes of ODS. HFC refrigerants are non-ozone depleting substitutes for ODS refrigerants. PFC are also non-ozone depleting compounds and may be used in industrial refrigeration applications. Generally, all of these classes of chemicals have very high global warming potentials, with potencies in the range of 500 to 10,000 times greater than that of CO₂.

The adopted regulation focuses on the largest source of emissions from the high-GWP sector – large commercial refrigeration systems, which have extensive GHG emission potential. Refrigeration systems are a primary source of emissions from the stationary source, high-GWP GHG sector; the United States Environmental Protection Agency (U.S. EPA) estimates that 37 percent of the stationary refrigeration and air-conditioning related emissions of high-GWP gases are from stationary, large commercial refrigeration systems.

Of all refrigeration systems using more than 50 pounds of a high-GWP refrigerant that were reported to the South Coast Air Quality Management District (SCAQMD) under their Rule 1415, on average, 29 percent leak annually. These leaking refrigeration systems lost, on average, 65 percent of their refrigerant charge annually. In many cases owners and operators of refrigeration systems can benefit financially from using the refrigerant best management practices required by the adopted regulation, because these systems would ultimately consume less refrigerant.

As a result of the Montreal Protocol's phaseout of ODS, these gases have typically been replaced with ODS substitutes such as HFC and PFC. For example, HFC blends with higher GWPs are currently being used to replace HCFC-22 as a refrigerant. While ODS have negative impacts for both climate change and stratospheric ozone, ODS substitutes do not deplete the ozone but are typically potent GHG.

The majority of ODS substitutes are Kyoto gases and are thus included in the California AB 32 GHG inventory. Emissions of Kyoto Protocol gases are increasing as ODS are phased out and are replaced by ODS substitutes. In total, the high-GWP sector, based on an average 2002-2004 emissions inventory, is estimated to represent approximately three percent of the statewide anthropogenic GHG inventory. However, the sector is growing rapidly primarily due to the increased use of ODS substitutes. Under a business-as-usual (BAU) scenario high-GWP gases are expected to be the fastest growing GHG sector in the California GHG inventory and are anticipated to more than triple to reach over 46 MMTCO₂E by 2020 – 8 percent of the total estimated California GHG inventory.

The low cost of many high-GWP refrigerants, as well as a lack of incentives for emission control, have resulted in the common practice of re-charging leaky, poorly designed, and/or poorly maintained systems without attempting repair. Although ODS refrigerant prices are expected to rise as they are phased out of production, currently low costs and the lack of enforced regulations limiting releases have led to low recovery and reclamation rates for many high-GWP refrigerants. As a result, refrigerant venting occurs during maintenance or end-of-life disposal. In sum, the Refrigerant Management Program's leak detection and monitoring, leak repair, and retrofit and retirement components offer an integrated strategy for achieving significant reductions from the commercial refrigeration sector.

DESCRIPTION OF THE ADOPTED REGULATORY ACTION

The adopted regulation is designed to: 1) reduce emissions of high-GWP refrigerants from stationary, non-residential refrigeration equipment, 2) reduce emissions resulting from the installation and servicing of stationary refrigeration

and air-conditioning (R/AC) appliances using high-GWP refrigerants, and 3) verify emission reductions.

The adopted regulation applies to: 1) any person who owns or operates a stationary refrigeration system that uses more than 50 pounds of a high-GWP refrigerant; 2) any person who installs, repairs, maintains, services, replaces, recycles, or disposes of a stationary R/AC appliance; and 3) any person who distributes or reclaims high-GWP refrigerants.

The adopted regulation specifies: 1) stationary refrigeration refrigerant management practices, 2) stationary R/AC appliance required service practices, and 3) refrigerant distributor, wholesaler, and reclaimer requirements.

Stationary Refrigeration Refrigerant Management Practices

The stationary refrigeration refrigerant management practices apply to any refrigeration system that uses more than 50 pounds of a high-GWP refrigerant. The applicable requirements vary based on the amount of high-GWP refrigerant used by a refrigeration system, this volume is known as the “refrigerant charge size.” Refrigeration systems are categorized based on the refrigerant charge size as a large refrigeration system, medium refrigeration system, or small refrigeration system.

All facilities with a refrigeration system with a refrigerant charge size greater than 50 pounds will be required to register, with the initial registration due date based on the refrigeration system with the largest refrigerant charge size in operation at a facility. Facilities with a refrigeration system in operation with a refrigerant charge of 200 pounds or greater will be also required to pay an initial implementation fee at the time of registration and an annual fee each year thereafter. The implementation fee amount paid by a facility is based on the single refrigeration system with the largest refrigerant charge size in operation at a facility. The requirements based on the refrigerant charge size are to address the greater potential emissions from refrigeration systems with larger refrigerant charges; estimated BAU emissions from large and medium refrigeration systems account for 91% of total emissions from facilities with refrigeration systems with a refrigerant charge over 50 pounds, while only representing 40% of the total estimated facilities.

All owners or operators of facilities with a refrigeration system(s) in operation with a refrigerant charge size greater than 50 pounds will be required to comply with refrigerant leak detection and monitoring, refrigerant leak repair, and refrigeration system retrofit or retirement requirements.

Under the adopted regulation, owners or operators of facilities with a refrigeration system(s) in operation with a refrigerant charge size greater than 50 pounds will be subject to recordkeeping and reporting requirements. Requirements include maintaining records on refrigeration system service and leak repair and

refrigerant purchase and use. Owners or operators of facilities with a refrigeration system(s) in operation with a refrigerant charge of 200 pounds or greater will be required to annually report this information to ARB.

Stationary Refrigeration and Air-Conditioning Appliance Required Service Practices

The adopted regulation includes required service practices that apply to any person installing, maintaining, servicing, repairing, modifying, or disposing of a stationary R/AC appliance that uses a high-GWP refrigerant.

The majority of required service practices are based on rules promulgated by the U.S. EPA under the federal Clean Air Act (CAA), Section 608. These rules forbid intentional venting and require refrigerant recovery using approved equipment and procedures and refrigerant evacuation for stationary or MVAC appliances. These existing federal requirements currently apply only to ODS refrigerants, except for the prohibition on intentional venting, which is also applicable to ODS substitute refrigerants. The adopted regulation would extend these requirements to all high-GWP refrigerants. Required service practices not based on existing rules promulgated by U.S. EPA include restrictions on adding refrigerant to a stationary R/AC appliance, use of approved refrigerants in a stationary R/AC appliance, and refrigerant recovery from refrigerant cylinders.

Refrigerant Distributor, Wholesaler, and Reclaimer Requirements

The adopted regulation includes prohibitions that are based on rules promulgated by the U.S. EPA that apply to refrigerant distributors, wholesalers, and reclaimers. These existing federal requirements currently apply only to ODS refrigerants; the adopted regulation would extend the requirements to all high-GWP refrigerants. Prohibitions not based on existing rules promulgated by the U.S. EPA include sale of only approved refrigerants and refrigerant recovery from refrigerant cylinders.

Under the adopted regulation, refrigerant distributors, wholesalers, and reclaimers will be subject to recordkeeping and reporting requirements. Requirements include maintaining records of high-GWP refrigerant purchases, sales, shipments, and reclamation for refrigerant reclaimers. Refrigerant distributors, wholesalers, and reclaimers will also be required to annually report this information to ARB.