

**ANALYSIS OF PROPOSED AGREEMENT CONTAINING CONSENT ORDERS TO  
AID PUBLIC COMMENT**

*In the Matter of American Air Liquide Holdings, Inc.*

*File No. 161 0045*

**I. INTRODUCTION**

The Federal Trade Commission (“Commission”) has accepted, subject to final approval, an Agreement Containing Consent Orders (“Consent Agreement”) designed to remedy the anticompetitive effects resulting from the proposed acquisition of Airgas, Inc. (“Airgas”) by American Air Liquide Holdings, Inc. (“Air Liquide”). Pursuant to the Consent Agreement, Air Liquide will divest sixteen air separation units (“ASUs”), four vertically integrated dry ice and liquid carbon dioxide plants, two separate liquid carbon dioxide plants, two nitrous oxide plants, and three retail packaged welding gas and hardgoods stores. Air Liquide has agreed to divest the required facilities to one or more Commission-approved buyers within four months of consummating its transaction with Airgas. The divestiture of these facilities and related assets will preserve the competition between Air Liquide and Airgas that the proposed acquisition would otherwise eliminate.

The proposed Consent Agreement has been placed on the public record for thirty days for receipt of comments by interested persons. Comments received during this period will become part of the public record. After thirty days, the Commission will again review the proposed Consent Agreement and the comments received, and will decide whether it should withdraw from the proposed Consent Agreement, modify it, or make final the accompanying Decision and Order (“Order”).

**II. THE TRANSACTION**

Pursuant to an Agreement and Plan of Merger dated November 17, 2015, a wholly owned subsidiary of Air Liquide will merge with and into Airgas in a transaction valued at approximately \$13.4 billion. The Commission’s Complaint alleges that the proposed acquisition, if consummated, would violate Section 7 of the Clayton Act, as amended, 15 U.S.C. § 18, and Section 5 of the Federal Trade Commission Act, as amended, 15 U.S.C. § 45, by substantially lessening competition in various geographic markets for bulk oxygen, bulk nitrogen, bulk argon, bulk nitrous oxide, bulk liquid carbon dioxide, dry ice, and retail packaged welding gases.

**III. THE PARTIES**

Air Liquide is an international company specializing in industrial gases and related services. Air Liquide is the fourth-largest atmospheric gas producer in the United States, operating forty-nine liquid ASUs spread throughout the country. In the United States, Air Liquide also operates two nitrous oxide production facilities and eleven liquid carbon dioxide production facilities, six of which also produce dry ice. Air Liquide has largely exited its retail packaged gas and hardgoods business in the United States, but still operates five branch locations

in Alaska. In 2015, Air Liquide's revenue totaled €16.4 billion, with €3.9 billion coming from the United States.

Airgas, headquartered in Radnor, Pennsylvania, is the leading U.S. distributor of packaged industrial, medical, and specialty gases and hardgoods, such as welding equipment and supplies. Airgas is the fifth-largest atmospheric gas producer in the United States, operating seventeen liquid ASUs, most of which are concentrated in the eastern half of the country. Airgas also operates a number of other industrial gas production plants, including three nitrous oxide production facilities, eleven liquid carbon dioxide production facilities, and fourteen dry ice production facilities. Airgas operates a network of approximately nine hundred retail branches where it sells hardgoods and packaged gas. For the fiscal year ending March 31, 2015, Airgas's consolidated net sales were approximately \$5.3 billion, with over 98% of those revenues coming from the United States.

#### **IV. THE RELEVANT MARKETS FOR BULK OXYGEN, BULK NITROGEN, AND BULK ARGON**

Atmospheric gases are gases that are present in the Earth's atmosphere. Industrial gas suppliers like Airgas and Air Liquide produce atmospheric gases for use in a wide range of applications, including oil and gas, steelmaking, health care, and food manufacturing. Liquid oxygen, nitrogen, and argon are three of the most widely used atmospheric industrial gases, and each has specific properties that make it uniquely suited for the applications for which it is used. For most of these applications, there is no substitute for the use of oxygen, nitrogen, or argon.

Atmospheric gases are distributed to customers in different forms and methods depending on the volume of gas the customer requires. Customers who require large volumes are supplied either by on-site ASUs that are located at the customer's facility or by a pipeline connecting a plant to that customer. Bulk customers are those who have significant volume requirements, but are not large enough to justify on-site or pipeline gas delivery. Bulk customers typically are supplied with bulk oxygen, bulk nitrogen, or bulk argon in cryogenic trailers carrying the gas in liquid form. The liquid form is more condensed than the gaseous form and therefore easier to transport and store in large quantities. The bulk liquid gases are then stored in tanks located at the customer site. From there, customers can either use the product in its liquid form or convert it back to gas. Small-volume customers purchase nitrogen, oxygen, or argon in cylinders containing the product in gaseous form. These smaller customers are usually served by distributors, who receive their product from industrial gas suppliers in bulk liquid form. It is not feasible for bulk oxygen, bulk nitrogen, or bulk argon customers to switch distribution methods because their demand is too great for cylinder delivery and too small for on-site, or pipeline delivery.

For atmospheric gases, the ratio of the product's value to its transportation costs largely determines the relevant geographic market. Due to the relatively low sales price of bulk oxygen and nitrogen and the significant freight costs associated with transporting them, these gases can generally only be shipped economically a maximum distance of approximately 100 to 250 miles

from the ASU that produces the gas. Therefore, it is appropriate to analyze the competitive effects of the proposed acquisition in regional geographic markets for bulk oxygen and bulk nitrogen. The relevant geographic markets in which to analyze the effects of the proposed acquisition are: (1) the Northeast; (2) the Mid-Atlantic; (3) the Southeast; (4) Atlanta and surrounding areas; (5) Arkansas and surrounding areas; (6) Oklahoma and surrounding areas; (7) Western Kentucky and surrounding areas; (8) Chicago, Milwaukee, and surrounding areas; (9) Western Ohio and surrounding areas; and (10) Pittsburgh, Cleveland, and surrounding areas. Because bulk argon is a rarer and more expensive product than bulk oxygen and bulk nitrogen, it may be economically transported over greater distances. Therefore, the relevant geographic area in which to analyze the effects of the proposed acquisition on the bulk argon market is the United States.

The proposed acquisition would harm competition in the relevant markets for bulk oxygen and bulk nitrogen. Each market includes areas in which both Air Liquide and Airgas have plants that are particularly well situated to economically serve a large set of customers. The proposed acquisition would eliminate an important source of competition for those customers, would increase concentration in the relevant markets, and would cause prices to rise. For bulk argon, there are six significant suppliers in the United States, the largest of which is Air Liquide. The proposed acquisition would substantially increase concentration in bulk argon, creating a highly concentrated market.

## **V. THE RELEVANT MARKET FOR BULK NITROUS OXIDE**

Nitrous oxide is a clear, odorless gas that is produced by heating and purifying ammonium nitrate. Commonly known as “laughing gas,” nitrous oxide is mainly used by dentists as an analgesic or a weak anesthetic. Other uses for nitrous oxide include augmenting combustion in automotive products, oxidizing rocket fuel, and manufacturing whipped cream and semiconductors. Customers who purchase nitrous oxide in bulk form are typically distributors who repackage the gas in smaller quantities. Most sales for end-use are made in cylinders to dental offices. Because of the unique properties of nitrous oxide, other gases are not considered substitutes. Consequently, customers would not switch to another gas or product even if the price of bulk nitrous oxide increased by five to ten percent.

Currently only five nitrous oxide production facilities service the entire United States and Canada. Bulk nitrous oxide is typically transported in tanker trucks. When purchasing bulk nitrous oxide, customers are not concerned with finding the closest production facility when choosing a supplier. Therefore, the relevant geographic area in which to analyze the effects of the proposed acquisition on the bulk nitrous oxide market is the United States and Canada.

Air Liquide and Airgas are the only two producers of nitrous oxide in the United States and Canada. Airgas is the largest producer of nitrous oxide in North America and maintains three separate facilities located Cantonment, Florida, Yazoo City, Mississippi, and Maitland,

Ontario. Air Liquide operates two North American nitrous oxide plants in Donora, Pennsylvania and Richmond, California. The proposed acquisition would produce a monopoly in the market for bulk nitrous oxide.

## **VI. THE RELEVANT MARKETS FOR BULK LIQUID CARBON DIOXIDE**

Carbon dioxide is a “process gas,” meaning that it is captured as a by-product of other manufacturing processes, such as ethanol, ammonia, and hydrogen. It is also captured from natural sources such as natural gas wells. The carbon dioxide is then put in liquid form through a cryogenic process in plants typically located adjacent to carbon dioxide gas sources. The most common application for liquid carbon dioxide is food and beverage production, where it is used to carbonate beverages, chill and freeze food, and stun animals before they are slaughtered. For the vast majority of applications, there are no viable substitutes for liquid carbon dioxide.

Suppliers deliver liquid carbon dioxide to customers in bulk trailers or rail cars. Most customers store liquid carbon dioxide in tanks located at their manufacturing facilities until it is used. Customers would not switch to micro-bulk or cylinder delivery because bulk delivery is far cheaper and they would have to contend with managing significantly more deliveries to meet their needs. In addition, customers would not consider self-sourcing liquid carbon dioxide unless the cost increased significantly more than ten percent because extracting carbon dioxide requires expensive infrastructure and the supply of carbon dioxide is shrinking.

Significant freight costs associated with transporting liquid carbon dioxide relative to its sales price make it economical to ship liquid carbon dioxide no more than 250 miles by truck. In areas with few or no carbon dioxide sources, liquid carbon dioxide is shipped as much as 750 miles by rail. Therefore, it is appropriate to analyze the competitive effects of the proposed acquisition in regional geographic markets for bulk liquid carbon dioxide. For bulk liquid carbon dioxide, the relevant geographic markets in which to analyze the effects of the proposed acquisition are: (1) Indiana, Kentucky, and surrounding areas; (2) Mississippi and surrounding areas; and (3) the Texas Panhandle and surrounding areas.

Two of the three relevant markets for bulk liquid carbon dioxide are highly concentrated and the proposed acquisition would substantially increase concentration. While the Indiana, Kentucky and surrounding areas market is moderately concentrated, the proposed acquisition would produce a significant increase in concentration and would leave the combined entity as the leading supplier. In addition, for some customers in that region, the merging firms are the closest competitors.

## **VII. THE RELEVANT MARKETS FOR DRY ICE**

In the United States, both parties produce and sell dry ice. Dry ice is the solid form of carbon dioxide, and a significant portion of the carbon dioxide market. It is produced when liquid carbon dioxide is injected into an atmospheric chamber, which causes some of the liquid carbon dioxide to vaporize into a gas, while reducing the temperature of the remaining liquid.

The remaining liquid solidifies into a snow-like consistency. This snow is then collected and pressed into dry ice blocks or pellets, and distributed to customers in standard or bulk pellet bags, or in blocks, slices, or sticks. Dry ice has many applications, including shipping of frozen food and medical supplies, cooling of materials during production, and industrial blast cleaning. It is used in a variety of industries such as food processing, transportation, and biotechnology. Suppliers of dry ice either sell directly to end users, or wholesale to distributors or resellers. For the vast majority of applications, there are no viable substitutes for dry ice.

Dry ice begins to dissipate as soon as it is produced. As a result, dry ice is not typically transported more than 150 miles to a customer, although where local supply is insufficient, customers are willing to have dry ice shipped up to 350 miles. Therefore, it is appropriate to analyze the competitive effects of the proposed acquisition in regional geographic markets for dry ice. The relevant geographic markets in which to analyze the effects of the proposed acquisition are: (1) the San Francisco Bay Area; (2) Iowa and surrounding areas; and (3) the Texas Panhandle and surrounding areas.

Air Liquide and Airgas are the only two producers of dry ice in the San Francisco Bay Area. Consequently, the proposed acquisition, without remedy, would lead to Air Liquide holding a monopoly. In the two remaining dry ice markets, the proposed acquisition would substantially decrease competition in an already highly concentrated market, and would leave the combined entity as the leading supplier.

## **VIII. THE RELEVANT MARKETS FOR RETAIL PACKAGED WELDING GASES**

Air Liquide and Airgas operate retail packaged gas stores in close proximity to each other in Anchorage, Fairbanks, and Kenai, Alaska. Packaged welding gas and hardgoods stores are outlets where customers can purchase cylinders of various gases and related hardgoods used for welding, such as safety gear and other physical goods. While customers may choose to purchase both their packaged welding gases and hardgoods at the same retail location, they are also willing to purchase packaged welding gas from one store and hardgoods from another. Customers cannot turn to alternatives for their packaged welding gases, such as bulk delivery from ASUs or filling their own cylinders because their purchasing volumes are too low to justify large quantity purchases. Additionally, for the vast majority of applications, there are no viable substitutes for packaged welding gases.

Generally, purchasers of packaged welding gases travel approximately twenty-five miles to make purchases at retail outlets. Even in Alaska, where there are fewer retail stores and customers may be willing to travel further, it is unlikely that customers would travel over fifty miles to a retail location to purchase packaged welding gases. Therefore, it is appropriate to analyze the competitive effects of the proposed acquisition in local geographic markets for retail packaged welding gas. Accordingly, the relevant geographic markets at issue in this case are the local areas of: (1) Anchorage, Alaska; (2) Fairbanks, Alaska; and (3) Kenai, Alaska. The proposed acquisition would reduce the number of competitors from two to one in each of these markets.

## VIII. EFFECTS OF THE ACQUISITION

The proposed acquisition would eliminate direct and substantial competition between Air Liquide and Airgas in each of the relevant markets, provide Air Liquide with a larger base of sales on which to enjoy the benefit of a unilateral price increase, and eliminate a competitor to which customers otherwise could have diverted their sales in markets where alternative sources of supply are limited. The proposed acquisition, therefore, likely would allow Air Liquide to exercise market power unilaterally, increasing the likelihood that purchasers of bulk oxygen, bulk nitrogen, bulk argon, bulk nitrous oxide, bulk liquid carbon dioxide, dry ice, or retail packaged welding gas would be forced to pay higher prices in the relevant areas.

The proposed acquisition would also enhance the likelihood of collusion or coordinated action between or among the remaining firms in the relevant markets for bulk oxygen, bulk nitrogen, bulk argon, bulk liquid carbon dioxide, and dry ice because a significant competitor would be eliminated, and only a small number of viable competitors would remain. In addition, certain conditions prevalent in these relevant markets, including the relative homogeneity of the firms and products involved and availability of detailed market information, are conducive to collusion or coordinated action.

## X. ENTRY

New entry into the relevant markets would not occur in a timely manner sufficient to deter or counteract the likely adverse competitive effects of the proposed acquisition.

Entry into the bulk oxygen, nitrogen, and argon markets is costly, difficult, and unlikely because of, among other things, the time and cost required to construct the ASUs that produce these products. Constructing an ASU at a scale sufficient to be viable in the market would cost at least \$30 to \$100 million, most of which are sunk costs. Moreover, it is not economically justifiable to build an ASU unless a significant amount of the plant's capacity has been pre-sold prior to construction, either to an on-site customer or to customers with commitments under contract. Such pre-sale opportunities occur infrequently and unpredictably and can take several years to secure.

Entry into the bulk nitrous oxide market is costly, difficult, and unlikely because of, among other things, the time and cost required to construct a plant capable of producing nitrous oxide. Constructing such a plant would cost at least \$5 to \$10 million, and the demand for nitrous oxide is generally insufficient to justify the investment in building a nitrous oxide plant. In addition, there are regulatory barriers to overcome due to the hazardous nature of producing nitrous oxide.

Entry into the bulk liquid carbon dioxide and dry ice markets would also not be timely, likely, or sufficient to deter or counteract the adverse competitive effects of the proposed acquisition. Constructing a plant capable of producing bulk liquid carbon dioxide would cost at

least \$10 to \$30 million. In addition, successful entry into the bulk liquid carbon dioxide market requires access to raw carbon dioxide supply sources, which are typically unavailable due to long-term contracts with incumbent liquid carbon dioxide suppliers. For dry ice production, there are similar entry barriers. Because liquid carbon dioxide is the primary input in dry ice production, the most significant barrier to entering the market for dry ice is obtaining a liquid carbon dioxide source. The entrant would also have to build a dry ice facility, but sales opportunities would likely be too small to justify the sunk costs associated with the required investment.

Entry into the retail packaged welding gases market would also not be timely, likely or sufficient to deter or counteract the likely adverse competitive effects of the proposed acquisition. Currently, Air Liquide is the only entity capable of filling packaged gases in the relevant geographic markets for retail packaged welding gas, all of which are in Alaska. A new entrant would be required either to purchase bulk gases and construct a fill plant to put the gases in packaged form or to establish a supply network to transport packaged gases from a fill plant outside of Alaska to the relevant geographic markets. Because of these obstacles, new entry into the relevant markets is unlikely to occur.

## **XI. THE CONSENT AGREEMENT**

The proposed Consent Agreement is designed to eliminate the competitive concerns raised by Air Liquide's proposed acquisition of Airgas in each relevant market. Under the terms of the proposed Consent Agreement, Air Liquide is required to divest sixteen ASUs, twelve of which are currently owned and operated by Air Liquide and four of which are currently owned and operated by Airgas. The Air Liquide-operated ASUs are located in: (1) Burlington, Wisconsin; (2) Chattanooga, Tennessee; (3) Feura Bush, New York; (4) Holland, Ohio; (5) Mapleton, Illinois; (6) Middletown, Ohio; (7) Mount Vernon, Indiana; (8) Pittsboro, Indiana; (9) St. Marys, Pennsylvania; (10) Spartanburg, South Carolina; (11) Wake Forest, North Carolina; and (12) West Point, Virginia. The Airgas-operated ASUs are located in: (1) Carrollton, Kentucky; (2) Gaston, South Carolina; (3) Lawton, Oklahoma; and (4) Mulberry, Arkansas. Air Liquide is also required to divest both of its nitrous oxide plants, one located in Denora, Pennsylvania and the other in Richmond, California. Air Liquide must also divest four co-located liquid carbon dioxide and dry ice facilities, which comprise its entire dry ice business, located in: (1) Borger, Texas; (2) Galva, Iowa; (3) Sioux City, Iowa; (4) and Martinez, California.

Additionally, Air Liquide will divest two liquid carbon dioxide-only facilities in Madison, Mississippi and Washington, Indiana along with the associated rail depot located in Fort Meade, Florida. Lastly, Air Liquide will divest Airgas's retail packaged welding gas and hardgoods stores located in Anchorage, Fairbanks, and Kenai, Alaska. Additionally, with regard to the ASU assets, although the anticompetitive effects of Air Liquide's acquisition of Airgas are related to the bulk liquid oxygen, nitrogen, and argon markets, the pipeline oxygen and nitrogen businesses and contracts located at the ASUs are also being divested because they are critical to the viability, efficiency, and competitiveness of each plant. Air Liquide has agreed to divest the

required facilities, together with all related equipment, customer and supply contracts, technology, and goodwill, to one or more Commission-approved buyers within four months of consummating its transaction with Airgas.

Any acquirer of the divested assets must receive the prior approval of the Commission. The Commission's goal in evaluating possible purchasers of divested assets is to maintain the competitive environment that existed prior to the acquisition. A proposed acquirer of divested assets must not itself present competitive problems. There are a number of parties interested in purchasing the assets to be divested that have the expertise, experience, and financial viability to successfully purchase and manage these assets and retain the current level of competition in the relevant markets. The Commission is therefore satisfied that sufficient potential buyers for the divested assets in each relevant market currently exist.

The proposed Consent Agreement incorporates a proposed Order to Maintain Assets to ensure the continued operations of the divestiture assets while a sale is conducted, and for a brief transition period once the Commission approves a buyer for the assets. The proposed Order to Maintain Assets also allows the Commission to appoint an interim monitor to oversee compliance with all the obligations and responsibilities under the proposed Order and requires Air Liquide to execute an agreement conferring upon the interim monitor all of the rights, powers, and authorities necessary to permit the monitor to ensure the continued health and competitiveness of the divested businesses.

The purpose of this analysis is to facilitate public comment on the proposed Consent Agreement, and it is not intended to constitute an official interpretation of the proposed Consent Agreement or to modify its terms in any way.