Hydrofluorocarbon Blends and Components from China

Investigation No. 731-TA-1279 (Preliminary)

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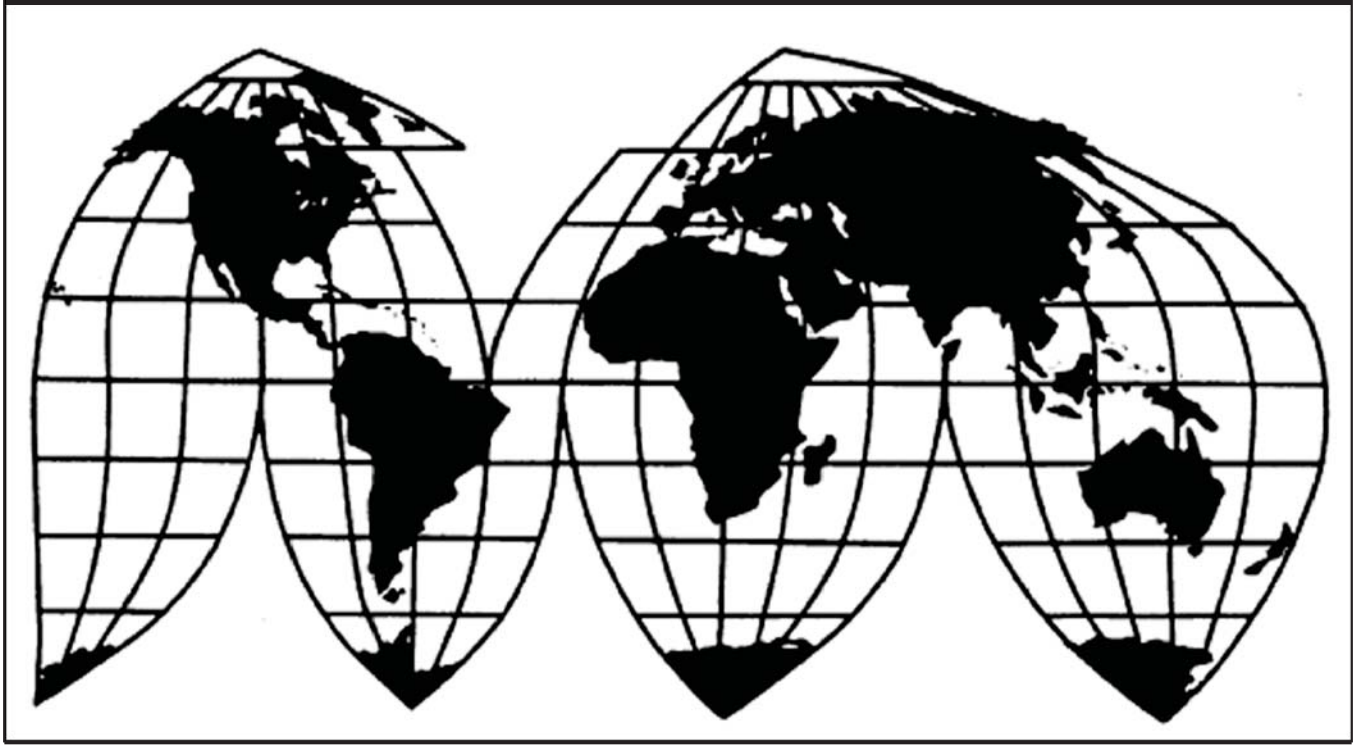
U.S. International Trade Commission



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UNITED STATES INTERNATIONAL TRADE COMMISSION

Investigation No. 731-TA-1279 (Preliminary)

Hydrofluorocarbon Blends and Components from China

DETERMINATION

On the basis of the record[1] developed in the subject investigation, the United States International Trade Commission ("Commission") determines, pursuant to the Tariff Act of 1930 ("the Act"), that there is a reasonable indication that an industry in the United States is materially injured by reason of imports of hydrofluorocarbon blends and components from China, provided for in subheadings 3824.78.00 and 2903.39.20 of the Harmonized Tariff Schedule of the United States, that are alleged to be sold in the United States at less than fair value ("LTFV").

COMMENCEMENT OF FINAL PHASE INVESTIGATION

Pursuant to section 207.18 of the Commission's rules, the Commission also gives notice of the commencement of the final phase of its investigation. The Commission will issue a final phase notice of scheduling, which will be published in the *Federal Register* as provided in section 207.21 of the Commission's rules, upon notice from the Department of Commerce ("Commerce") of an affirmative preliminary determination in the investigation under section 733(b) of the Act, or, if the preliminary determination is negative, upon notice of an affirmative final determination in that investigation under section 735(a) of the Act. Parties that filed entries of appearance in the preliminary phase of the investigation need not enter a separate appearance for the final phase of the investigation. Industrial users, and, if the merchandise under investigation is sold at the retail level, representative consumer organizations have the right to appear as parties in Commission antidumping and countervailing duty investigations. The Secretary will prepare a public service list containing the names and addresses of all persons, or their representatives, who are parties to the investigation.

BACKGROUND

On June 25, 2015, American HFC Coalition, and its members: Amtrol, Inc., West Warwick, Rhode Island; Arkema, Inc., King of Prussia, Pennsylvania; The Chemours Company FC LLC, Wilmington, Delaware; Honeywell International Inc., Morristown, New Jersey; Hudson Technologies, Pearl River, New York; Mexichem Fluor Inc., St. Gabriel, Louisiana; Worthington Industries, Inc., Columbus, Ohio; and District Lodge 154 of the International Association of Machinists and Aerospace Workers filed a petition with the Commission and Commerce, alleging that an industry in the United States is materially injured by reason of LTFV imports of

[1] The record is defined in sec. 207.2(f) of the Commission's Rules of Practice and Procedure (19 CFR § 207.2(f)).

hydrofluorocarbon blends and components from China. Accordingly, effective July 2, 2015, the Commission, pursuant to section 733(a) of the Tariff Act of 1930 (19 U.S.C. § 1673b(a)), instituted antidumping duty investigation No. 731-TA-1279 (Preliminary).

Notice of the institution of the Commission's investigation and of a public conference to be held in connection therewith was given by posting copies of the notice in the Office of the Secretary, U.S. International Trade Commission, Washington, DC, and by publishing the notice in the *Federal Register* of July 2, 2015 (80 FR 38231). The conference was held in Washington, DC, on July 16, 2015, and all persons who requested the opportunity were permitted to appear in person or by counsel.

Views of the Commission

Based on the record in the preliminary phase of this investigation, we find that there is a reasonable indication that an industry in the United States is materially injured by reason of imports of hydrofluorocarbon blends and components thereof ("HFC") from China that are allegedly sold in the United States at less than fair value.

I. The Legal Standard for Preliminary Determinations

The legal standard for a preliminary antidumping duty determination requires the Commission to determine, based upon the information available at the time of the preliminary determinations, whether there is a reasonable indication that a domestic industry is materially injured or threatened with material injury, or that the establishment of an industry is materially retarded, by reason of the allegedly unfairly traded imports.[1] In applying this standard, the Commission weighs the evidence before it and determines whether "(1) the record as a whole contains clear and convincing evidence that there is no material injury or threat of such injury; and (2) no likelihood exists that contrary evidence will arise in a final investigation."[2]

II. Background

The American Hydrofluorocarbon Coalition ("AHC" or Petitioners) and its individual members, Amtrol Inc.; Arkema Inc. ("Arkema"); The Chemours Company FC LLC ("Chemours"); Honeywell International Inc. ("Honeywell"); Hudson Technologies ("Hudson"); Mexichem Fluor Inc.; and Worthington Industries, Inc., as well as District Lodge 154 of the International Association of Machinists and Aerospace Workers, filed the petition in this investigation on June 25, 2015.[3] Petitioners appeared at the staff conference and submitted a postconference brief.

Several respondent entities participated in this investigation. The following respondents participated in the conference and filed postconference briefs: a coalition of 11 Chinese producers and exporters of subject merchandise and the Chinese Chamber of Commerce (collectively, the "Chinese respondents"); National Refrigerants, Inc. ("National"), a domestic producer of HFC blends and an importer of HFC components from China; the New Era Group ("New Era"), a trade association consisting of domestic producers of HFC blends and importers of HFC components from China; and Daikin America, Inc. ("Daikin"), an importer of subject merchandise. RMS of Georgia, a member of the New Era Group, also filed a postconference statement.

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[1] 19 U.S.C. §§ 1671b(a), 1673b(a) (2000); *see also American Lamb Co. v. United States*, 785 F.2d 994, 1001-04 (Fed. Cir. 1986); *Aristech Chem. Corp. v. United States, 2*0 CIT 353, 354-55 (1996).

[2] *American Lamb Co*., 785 F.2d at 1001; *see also Texas Crushed Stone Co. v. United States*, 35 F.3d 1535, 1543 (Fed. Cir. 1994).

[3] Confidential Report ("CR") at I-1; Public Report ("PR") at I-1.

U.S. industry data are based on the questionnaire responses of five firms that accounted for all subject HFC component production and the vast majority of HFC blend production during 2014.[4] Because official Commerce import statistics include merchandise outside the scope, U.S. import data are based on questionnaire responses from 14 U.S. importers accounting for approximately two-thirds of the merchandise imported under the most relevant HTS statistical reporting numbers.[5] Chinese industry data are based on the questionnaire responses of 13 foreign producers of subject merchandise whose exports to the United States accounted for approximately 25 percent of official U.S. import statistics and approximately two-thirds of the subject merchandise reported in response to the Commission's importer questionnaires.[6]

III. Domestic Like Product

A. Legal Standard

In determining whether there is a reasonable indication that an industry in the United States is materially injured or threatened with material injury by reason of imports of the subject merchandise, the Commission first defines the "domestic like product" and the "industry."[7] Section 771(4)(A) of the Tariff Act of 1930, as amended ("the Tariff Act"), defines the relevant domestic industry as the "producers as a whole of a domestic like product, or those producers whose collective output of a domestic like product constitutes a major proportion of the total domestic production of the product."[8] In turn, the Tariff Act defines "domestic like product" as "a product which is like, or in the absence of like, most similar in characteristics and uses with, the article subject to an investigation."[9]

The decision regarding the appropriate domestic like product(s) in an investigation is a factual determination, and the Commission has applied the statutory standard of "like" or "most similar in characteristics and uses" on a case-by-case basis.[10] No single factor is

[4] CR/PR at III-1.

[5] CR at IV-1 to IV-2, PR at IV-1.

[6] CR at VII-3 to VII-4, PR at VII-2.

[7] 19 U.S.C. § 1677(4)(A).

[8] 19 U.S.C. § 1677(4)(A).

[9] 19 U.S.C. § 1677(10).

[10] *See*, *e.g.*, *Cleo Inc. v. United States*, 501 F.3d 1291, 1299 (Fed. Cir. 2007); *NEC Corp. v. Department of Commerce*, 36 F. Supp. 2d 380, 383 (Ct. Int'l Trade 1998); *Nippon Steel Corp. v. United States*, 19 CIT 450, 455 (1995); *Torrington Co. v. United States*, 747 F. Supp. 744, 749 n.3 (Ct. Int'l Trade 1990), *aff'd*, 938 F.2d 1278 (Fed. Cir. 1991) ("every like product determination 'must be made on the particular record at issue' and the 'unique facts of each case'"). The Commission generally considers a number of factors including the following: (1) physical characteristics and uses; (2) interchangeability; (3) channels of distribution; (4) customer and producer perceptions of the products; (5) common manufacturing facilities, production processes, and production employees; and, where appropriate, (6) price. *See Nippon*, 19 CIT at 455 n.4; *Timken Co. v. United States*, 913 F. Supp. 580, 584 (Ct. Int'l Trade 1996).

dispositive, and the Commission may consider other factors it deems relevant based on the facts of a particular investigation.[11] The Commission looks for clear dividing lines among possible like products and disregards minor variations.[12] Although the Commission must accept Commerce's determination as to the scope of the imported merchandise that is sold at less than fair value,[13] the Commission determines what domestic product is like the imported articles Commerce has identified.[14]

B. Product Description

In its notice of initiation, Commerce defined the imported merchandise within the scope of this investigation as follows:

> The products subject to this investigation are blended hydrofluorocarbons (HFCs) and single HFC components of those blends thereof, whether or not imported for blending. HFC blends covered by the scope are R-404, a zeotropic mixture consisting of 52 percent 1,1,1-Trifluoroethane, 44 percent Pentafluoroethane, and 4 percent 1,1,1,2-Tetrafluoroethane; R-407A, a zeotropic mixture of 20 percent Difluoromethane, 40 percent Pentafluoroethane, and 40 percent 1,1,1,2-Tetrafluoroethane; R-407C, a zeotropic mixture of 23 percent Difluoromethane, 25 percent Pentafluoroethane, and 52 percent 1,1,1,2-Tetrafluoroethane; R-410A, a zeotropic mixture of 50 percent Difluoromethane and 50 percent Pentafluoroethane; and R-507 A, an azeotropic mixture of 50 percent Pentafluoroethane and 50 percent 1,1,1-Trifluoroethane also known as R-507. The foregoing percentages are nominal percentages by weight. Actual percentages of single component refrigerants by weight may vary by plus or minus two percent points from the nominal percentage identified above.

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[11] *See*, *e.g.*, S. Rep. No. 96-249 at 90-91 (1979).

[12] *See*, *e.g.*, *Nippon*, 19 CIT at 455; *Torrington*, 747 F. Supp. at 748-49*; see also* S. Rep. No. 96-249 at 90-91 (Congress has indicated that the like product standard should not be interpreted in "such a narrow fashion as to permit minor differences in physical characteristics or uses to lead to the conclusion that the product and article are not 'like' each other, nor should the definition of 'like product' be interpreted in such a fashion as to prevent consideration of an industry adversely affected by the imports under consideration.").

[13] *See*, *e.g.*, *USEC, Inc. v. United States*, 34 Fed. App'x 725, 730 (Fed. Cir. 2002) ("The ITC may not modify the class or kind of imported merchandise examined by Commerce."); *Algoma Steel Corp. v. United States,* 688 F. Supp. 639, 644 (Ct. Int'l Trade 1988), *aff'd*, 865 F.3d 240 (Fed. Cir.), *cert. denied*, 492 U.S. 919 (1989).

[14] *Hosiden Corp. v. Advanced Display Mfrs.,* 85 F.3d 1561, 1568 (Fed. Cir. 1996) (the Commission may find a single like product corresponding to several different classes or kinds defined by Commerce); *Cleo*, 501 F.3d at 1298 n.1 ("Commerce's {scope} finding does not control the Commission's {like product} determination."); *Torrington*, 747 F. Supp. at 748-52 (affirming the Commission's determination defining six like products in investigations where Commerce found five classes or kinds).

> The single component HFCs covered by the scope are R-32, R-125, and R-143a. R-32 or Difluoromethane has the chemical formula CH_2F_2, and is registered as CAS No. 75-10-5. It may also be known as HFC-32, FC-32, Freon-32, Methylene difluoride, Methylene fluoride, Carbon fluoride hydride, halocarbon R32, fluorocarbon R32, and UN 3252. R-125 or 1,1,1,2,2-Pentafluoroethane has the chemical formula CF_3CHF_2 and is registered as CAS No. 354-33-6. R-125 may also be known as R-125, HFC-125, Pentafluoroethane, Freon 125, and Fc-125, RI25. R-143a or 1,1,1-Trifluoroethane has the chemical formula CF3CH3 and is registered as CAS No. 420-46-2. R-143a may also be known as R-143a, HFC-143a, Methylfluoroform, 1,1,1-Trifluoroform, and UN2035.
>
> Excluded from this investigation are blends of refrigerant chemicals that include products other than HFCs, such as blends including chlorofluorocarbons (CFCs) or hydrochlorofluorocarbons (HCFCs).
>
> Also excluded from this investigation are patented HFC blends, such as ISCEON® blends, including M099™ (RR-438A), M079 (R-422A), M059 (R-417A), *M049Plus™* (R-437A) and M029™ (R-4 22D), and Genetron® PerformaxTM LT (R-407F).[15]
>
> * * *

The scope of the investigation includes the five major HFC blends sold in the U.S. market. These are R-404A, R-407A, R-407C, R-410A, and R-507A.[16] HFC blends are colorless, odorless gasses used as low-to-medium temperature refrigerants in residential and commercial air conditioning and commercial refrigeration, transport refrigeration, and process applications.[17] They were developed as a replacement for HCFCs (hydrochlorofluorocarbons, such as R-22), which deplete the ozone layer and are being phased out pursuant to the Montreal Protocol.[18]

The scope of the investigation also includes three of the four HFC components used to produce the five HFC blends within the scope. These three in-scope components are R-32, R-125, and R-143a. A fourth HFC component used to produce in-scope HFC blends, R-134a, is expressly excluded from the scope of the investigation.[19] All in-scope HFC blends are made from R-125 and one or two more of the other HFC components blended in precise ratios.[20] The record indicates that the vast majority of domestic production of subject HFC components is consumed in the production of HFC blends.[21]

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[15] *Hydrofluorocarbon Blends and Components Thereof from the People's Republic of China: Initiation of Antidumping Duty Investigation*, 80 Fed. Reg. 43387 (July 22, 2015).

[16] Petition at 11.

[17] *See* CR at I-14 to I-15, PR at I-10 to I-11.

[18] CR at I-8 n.11, I-15; PR at I-6 n.11, I-11.

[19] The Commission recently conducted investigations on R-134a. *1,1,1,2-Tetrafluoroethane from China*, Inv. Nos. 701-TA-509, 731-TA-1244 (Final), USITC Pub. 4503 (Dec. 2014).

[20] *See* CR/PR at Table I-1.

[21] CR at I-21; PR at I-14.

C. Analysis

Petitioners contend that the Commission should define a single domestic like product consisting of all HFC blends and components within the scope definition.[22] For purposes of the preliminary phase of this investigation, respondents concur with Petitioners that the five HFC blends should be within the same domestic like product, but argue that HFC blends and those HFC components within the scope should be treated as distinct domestic like products.[23]

For the reasons discussed below and for the purposes of this preliminary determination, we find a single domestic like product consisting of all HFC blends and components described in the scope definition. As previously stated, the parties do not dispute for purposes of the preliminary phase of the investigation that all five subject HFC blends should be in the same domestic like product, and we agree that such treatment is appropriate.[24]

The parties dispute whether HFC components should be defined as a single domestic like product distinct from HFC blends. Because this issue involves products at different stages of processing, we analyze the question using the Commission's semi-finished product analysis.[25]

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[22] Petition at 7.

[23] CR at I-15, PR at I-11; National's Postconference Brief at 6-26.

[24] The record indicates that each of the five blends is used in air conditioning and refrigeration applications and is sold to distributors and service centers. CR at I-15 to I-16, PR at I-11 to I-12; and CR/PR at Tables I-1, I-10. Although no respondent argued that the Commission should define the domestic like product more broadly than the scope definition for the purposes of the preliminary phase of this investigation, the Chinese respondents requested that in any final phase of the investigation that the Commission collect data on several types of merchandise not in the scope. These include R-134a, patented blends, and other blends that are not within the scope but exclusively contain in-scope components and R-134a. *See, e.g.*, Chinese Respondents' Postconference Brief at 9-10. We intend to collect data on R-134a in any final phase of this investigation and invite parties in their comments on the draft questionnaires to address the appropriateness of collecting data concerning HFC blends that are outside the scope.

[25] In a semi-finished product analysis, the Commission currently examines: 1) whether the upstream article is dedicated to the production of the downstream article or has independent uses; 2) whether there are perceived to be separate markets for the upstream and downstream articles; 3) differences in the physical characteristics and functions of the upstream and downstream articles; 4) differences in the costs or value of the vertically differentiated articles; and 5) significance and extent of the processes used to transform the upstream into the downstream articles. *See*, *e.g.*, *Glycine from India*, *Japan*, *and Korea*, Inv. Nos. 731-TA-1111-1113 (Preliminary), USITC Pub. No. 3921 at 7 (May 2007); *Artists' Canvas from China*, Inv. No. 731-TA-1091 (Final), USITC Pub. No. 3853 at 6 (May 2006); *Live Swine from Canada*, Inv. No. 731-TA-1076 (Final), US1TC Pub. 3766 at 8 n.40 (Apr. 2005); *Certain Frozen Fish Fillets from Vietnam*, Inv. No. 731-TA-1012 (Preliminary), USITC Pub. No. 3533 at 7 (Aug. 2002). We disagree with National that the Commission should use the six traditional domestic like product factors in analyzing whether to include HFC components in the same like product as HFC blends. The Commission generally applies its six-factor analysis to products at the same level of processing. *See Drill Pipe and Drill Collars from China*, Inv. Nos. 701-TA-474 and 731-TA-1176 (Preliminary), USITC Pub. 4127at 7 (March 2010). By contrast, nearly all HFC components are used as an intermediate product in the production of HFC blends. CR at I-21, PR at I-14.

Based on the following analysis, we find for the purposes of the preliminary phase of this investigation that HFC components and blends are not separate domestic like products.

Dedication for Use. *** of the domestic industry's production of HFC components within the scope was internally consumed, swapped, or sold to HFC blenders for the production of HFC blends within the scope.[26] Integrated producers (firms that produce both HFC components and blends) internally consume some components in the production of HFC blends, transfer some components to other integrated producers by use of swap arrangements, and sell other components to integrated producers or to blenders on the merchant market.[27] In 2014, only *** short tons of the domestic industry's U.S. shipments of in-scope HFC components went to distributors and service companies and original equipment manufacturers for possible use in applications other than blending.[28] Moreover, the industry's consumption of in-scope HFC components for the production of HFC blends outside the scope was minimal, as such blends reportedly accounted for only one percent of the U.S. HFC market.[29]

Separate Markets. HFC blends are sold to distributors and service companies, original equipment manufacturers, blenders and repackagers.[30] Although most in-scope HFC components are consumed in the production of HFC blends within the scope, there is also a distinct commercial market for components R-125 and R-32 for use in other applications.[31] R-125 can be used on its own as a fire suppressant, [32] and reportedly can be used in metal smelting applications, in foam blowing, and in certain medical applications for equipment that requires a non-flammable inert pressurized gas.[33] Both R-125 and R-32 reportedly are used also in semiconductor silicon wafer manufacturing as a gas for silicon etching.[34]

Differences in Physical Characteristics and Functions of the Upstream and Downstream Articles. There are similarities and differences between HFC components and HFC blends in terms of their physical characteristics and functions. The physical characteristics and functions of HFC components are similar to those of HFC blends in that the physical properties of any particular HFC blend, and thus its end-use applications, are determined by the physical properties of its constituent HFC components.[35] On the other hand, HFC components are used as intermediate products because, on their own, such components do not possess the required or desired collection of properties. For example, two of the in-scope components are flammable on their own.[36] Accordingly, the subject HFC components must be mixed together

[26] CR/PR at Table I-4.

[27] CR at I-19, III-2, PR at I-13, III-1 to III-2; and CR/PR at Table I-3.

[28] CR/PR at Table III-9.

[29] CR at I-23 & n.43, PR at I-16 & n.43.

[30] CR/PR at Table II-1.

[31] CR at I-10, PR at I-7 to I-8; *see also* National's Postconference Brief at 8; Conference Tr. at 136 (Goldfeder).

[32] Petition at 20, 34, and National's Postconference Brief at 8.

[33] National's Postconference Brief at 8.

[34] National's Postconference Brief at 8.

[35] Petition at 33; Conference Tr. at 17-18 (Cannon).

[36] CR at I-24, PR at I-16; Conference Tr. at 71-72 (Irani), 95 (Clark), 135 (Goldfeder); Petition at 20 (R-32 and R-143a are flammable and thus only used in HFC blends).

in prescribed ratios to make non-toxic, non-flammable HFC blends suitable for use as refrigerants in specific air conditioning and refrigeration applications,[37] although R-32 was recently approved for use as a stand-alone refrigerant.[38]

Differences in Value. During the period of investigation, the ratio of the average unit value of the industry's U.S. shipments of HFC components within the scope to the average unit value of industry's U.S. shipments of HFC blends ranged from *** percent to *** percent.[39] Based on reported financial data, the value added by the blending operations of integrated domestic producers ranged from 6.9 to 8.7 percent during the period of investigation, while the value added by National's non-integrated blending operations ranged from *** to *** percent during the period.[40]

Extent of Processes Used to Transform HFC Components into HFC Blends. To transform HFC components into HFC blends, HFC components are blended in a tank in the requisite ratios, analyzed for consistency with the desired HFC blend specifications, and then packaged.[41] Although the blending process is not as capital intensive as the process to produce HFC components and an HFC blending facility costs significantly less than an HFC component production facility, production of HFC blends involves technical expertise and sophisticated equipment.[42] Moreover, HFC blending operations employed more workers than HFC component-producing operations in each year of the POI.[43]

Conclusion. Based on the record at this time, our analysis of the Commission's semi-finished product factors does not warrant finding HFC components and blends to be distinct domestic like products. We will examine this issue further in any final phase of the investigation. Accordingly, for the purposes of the preliminary determination, we define a single domestic like product to include all HFC components and blends within the scope of the investigation.

IV. Domestic Industry

A. Legal Standard

The domestic industry is defined as the domestic "producers as a whole of a domestic like product, or those producers whose collective output of a domestic like product constitutes

[37] CR at I-23, PR at I-16; Conference Tr. at 51 (Clark), 71-72 (Irani), 95 (Clark).

[38] CR at I-10, PR at I-8.

[39] Calculated using CR at Table C-1.

[40] CR at VI-15 to VI-16, PR at VI-7.

[41] CR at I-12 to I-13, PR at I-9.

[42] *See* I-11 to I-13, I-16 to I-17, PR at I-8 to I-9, I-12; and CR/PR at Table I-2. *See also* Conference Tr. at 30-31 (Sassano), 49-50 (Clark), 151 (Ponder), 151 (Beatty). National claims that it has invested $*** in its HFC blending operations since January 1, 2011, and emphasizes that HFC blending production equipment must be accompanied by ancillary storage and handling equipment. National Postconference Brief at 16-19, Exhibit 22.

[43] CR/PR at Table III-13.

a major proportion of the total domestic production of the product."[44] In defining the domestic industry, the Commission's general practice has been to include in the industry producers of all domestic production of the like product, whether toll-produced, captively consumed, or sold in the domestic merchant market.

B. Related Parties

We must determine whether any producer of the domestic like product should be excluded from the domestic industry pursuant to Section 771(4)(B) of the Tariff Act.[45] This provision allows the Commission, if appropriate circumstances exist, to exclude from the domestic industry producers that are related to an exporter or importer of subject merchandise or which are themselves importers.[46] Exclusion of such a producer is within the Commission's discretion based upon the facts presented in each investigation.[47]

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[44] 19 U.S.C. § 1677(4)(A).

[45] There is no dispute that HFC blending involves sufficient activity to constitute domestic production. Petitioners have not challenged the status of National, an independent blender, as a domestic producer. The record indicates that National engages in sufficient production-related activities to qualify as a domestic producer. *See generally Drill Pipe and Drill Collars from China*, Inv. Nos. 701-TA-474 and 731-TA-1176 (Preliminary), USITC Pub. 4127 at 13 (March 2010) (articulation of factors the Commission generally considers). Specifically, the extent of National's investment in HFC blending activities, at $8.6 million since 2011, appears to be significant and National claims that its employees must possess "basic skills and expertise" to operate the equipment necessary to produce HFC blends, including blending tanks, laboratory instruments, and packaging equipment. *See* National Postconference Brief at 17-19. National's value added through its HFC blending operations ranged from *** to *** percent during the period of investigation and it employed from *** to *** production-related workers during the period. CR at VI-16, PR at IV-7; and Domestic Producers' Questionnaire Response of National at Question II-12. Finally, National sourced a significant quantity of inputs domestically, using domestically sourced HFC components for *** to *** percent of its domestic HFC blend production during the 2012-2014 period. CR/PR at Table at D-5.

[46] *See Torrington Co. v. United States*, 790 F. Supp. 1161, 1168 (Ct. Int'l Trade 1992), *aff'd without opinion*, 991 F.2d 809 (Fed. Cir. 1993); *Sandvik AB v. United States*, 721 F. Supp. 1322, 1331-32 (Ct. Int'l Trade 1989), *aff'd mem.,* 904 F.2d 46 (Fed. Cir. 1990); *Empire Plow Co. v. United States*, 675 F. Supp. 1348, 1352 (Ct. Int'l Trade 1987).

[47] The primary factors the Commission has examined in deciding whether appropriate circumstances exist to exclude a related party include the following:

(1) the percentage of domestic production attributable to the importing producer;
(2) the reason the U.S. producer has decided to import the product subject to investigation, *i.e*., whether the firm benefits from the LTFV sales or subsidies or whether the firm must import in order to enable it to continue production and compete in the U.S. market; and
(3) the position of the related producer vis-a-vis the rest of the industry, *i.e*., whether inclusion or exclusion of the related party will skew the data for the rest of the industry. *See, e.g., Torrington Co. v. United States*, 790 F. Supp. at 1168.

(Continued ...)

Petitioners argue that independent blenders that produce subject HFC blends primarily from subject imported HFC components should be excluded from the domestic industry as related parties. They allege that the interests of the independent blenders, particularly National, diverge from other blenders that utilize primarily domestically produced HFC components because such blenders benefit financially from the low prices established by subject imported HFC components and the inclusion of these blenders would skew industry data by ***.[48] National asserts that the Commission should not exclude it from the domestic industry as a related party because its primary interest is in the domestic production of HFC blends and that it has been forced to import the HFC components because domestic producers of HFC components are unwilling or unable to supply such components in sufficient quantities.[49]

All five domestic producers are related parties because they imported subject merchandise during the period of investigation: ***, and National.[50] We do not find that appropriate circumstances exist to exclude any related party from the domestic industry.

The Commission has also analyzed whether the interests of a related party producer lie principally in production or importation. *See*, *e.g.*, *Certain Crystalline Silicon Photovoltaic Products from China and Taiwan*, Inv. Nos. 701-TA-511, 731-TA-1246-1247 (Final), USITC Pub. 4519 at 17-18 (Feb. 2015), *aff'd, Changzhou Trina Solar Energy Co. v. United States Int'l Trade Comm'n*, Slip Op. 15-84 (Ct. Int'l Trade Aug. 7, 2015).

[48] Petitioner's Postconference Brief at 20-21. Petitioners claim that ***. *Id.*

[49] National's Postconference Brief at 41. National claims that the domestic producers of HFC components have collaborated to limit competition in the HFC blends market by depriving independent blenders of the HFC components. National alleges that the integrated HFC producers limit the production of each HFC component to one or two producers and then internally consume, swap, or export the bulk of their HFC component production. National's Postconference Brief at 28-29. Unable to source sufficient quantities of HFC components domestically, National asserts that it had no choice but to import HFC components from China. National's Postconference Brief at 30-31.

Petitioners counter that domestic integrated producers sell a significant volume of subject HFC components on the merchant market to meet HFC blender demand, in direct competition with subject imports. Petitioner's Postconference Brief at 25. Petitioners also argue that a significant volume of domestically produced HFC components are not swapped between domestic producers, but rather are sold at arms-length on a contract basis and that domestically produced HFC components received through swaps can often be resold, depending on the swap agreement. Petitioner's Postconference Brief at 24-25. We intend to explore the nature of the merchant market for HFC components in any final phase of this investigation.

[50] CR at III-18, PR at III-7. *** imported *** short tons of subject HFC components in 2012, *** short tons of in-scope HFC blends in 2014, and *** short tons of in-scope HFC blends in interim 2015. CR/PR at Table D-4. Hudson only reported information for production operations in 2012 and therefore we focus on that year. *See* CR/PR at VI-1. Because ***, its inclusion in the domestic industry would not skew domestic industry data. CR/PR at Table VI-3. Moreover, its importations were very limited, no party supports its exclusion, and Petitioners claim that ***. Petitioners' Postconference Brief at 21. Accordingly, we find that appropriate circumstances do not exist to exclude Hudson from the domestic industry.

*** were *** domestic producers of in-scope HFC components and blends during the period of investigation and are also ***.[51] The ratio of each of these producer's subject imports to domestic production was *** throughout the period of investigation, with the exception of ***.[52] Although *** reportedly imported HFC components from China ***,[53] and thus may have benefitted financially from the subject imports, the financial performance of each producer generally worsened as its ratio of subject imports to domestic production increased.[54] [55] For these reasons, we find that appropriate circumstances do not exist to exclude *** from the domestic industry as related parties.

We also find that appropriate circumstances do not exist to exclude National from the domestic industry. National was the *** largest domestic producer of HFC blends during the period of investigation, accounting for *** percent of domestic production during the period.[56] National's ratio of subject imports to domestic production declined from *** percent in 2012 to *** percent in 2013 and then to *** percent in 2014.[57] National's ratio of subject imports to domestic production was *** percent in interim 2015, as compared to *** percent in interim 2014.[58] Although these ratios are much higher than those for the related parties ***, National has argued that it had no choice but to import HFC components from China during the period of investigation because domestic integrated producers were unable or unwilling to supply it with domestically produced HFC components in the quantities required by its domestic HFC blending operations.[59] National's claimed inability to source sufficient quantities of domestically produced HFC components appears to be consistent with record evidence that the domestic industry shipped *** of HFC components to blenders during the period of investigation.[60] It is also consistent with National's consumption of domestically produced HFC components for *** to *** percent of its domestic HFC blend production from 2012 to 2014.[61] Notably, National did not import subject blends during the POI, but only imported subject components from

[51] CR/PR at Table III-1.

[52] CR/PR at Table III-12. Between 2012 and 2014, Arkema's ratio of subject imports to domestic production was ***, while Chemours' ratio increased from *** to *** percent, and Honeywell's ratio increased from *** percent to *** percent. *Id.* In January-March ("interim") 2015, Arkema's ratio of subject imports to domestic production was *** percent, Chemours' was *** percent, and Honeywell's was *** percent, as compared to ***, *** percent, and *** percent, respectively, in interim 2014. *Id.*

[53] *See* Importer's Questionnaire Responses of *** at Question II-4; *see also* Conference Tr. at 65 (Sassano).

[54] *See* CR/PR at Table VI-3.

[55] Vice Chairman Pinkert does not rely on a domestic producer's financial performance in determining whether there are appropriate circumstances to exclude it from the domestic industry.

[56] CR/PR at Table III-1.

[57] CR/PR at Table III-12.

[58] CR/PR at Table III-12.

[59] *See* Conference Tr. at 129, 136 (Beatty); National's Postconference Brief at 1, 4, 30, Exhibits 12 and 13.

[60] *Compare* CR/PR at Table III-7 *with id.* at Table III-9.

[61] CR/PR at Table D-5. National used domestically produced HFC components for *** percent of its HFC blend production in interim 2015, down from *** percent in interim 2014. *Id.*

China.[62] In addition, National reportedly has invested $*** in its HFC blending operations since January 1, 2011.[63] Consequently, the record indicates that National's primary interest is in production of the domestic like product, and we find that appropriate circumstances do not exist to exclude the firm from the domestic industry, notwithstanding that it generally had *** financial performance than other domestic producers[64] and that National opposes the petition with respect to HFC components, although it takes no position on the petition with respect to HFC blends.[65]

For the foregoing reasons, we find that appropriate circumstances do not exist to exclude any related party from the domestic industry. Therefore, we define the domestic industry as all producers of HFC components and blends within the scope of the investigation.

V. Reasonable Indication of Material Injury By Reason of Subject Imports

A. Legal Standards

In the preliminary phase of an antidumping duty investigation, the Commission determines whether there is a reasonable indication that an industry in the United States is materially injured or threatened with material injury by reason of the imports under investigation.[66] In making this determination, the Commission must consider the volume of subject imports, their effect on prices for the domestic like product, and their impact on domestic producers of the domestic like product, but only in the context of U.S. production operations.[67] The statute defines "material injury" as "harm which is not inconsequential, immaterial, or unimportant."[68] In assessing whether there is a reasonable indication that the domestic industry is materially injured by reason of subject imports, we consider all relevant economic factors that bear on the state of the industry in the United States.[69] No single factor is dispositive, and all relevant factors are considered "within the context of the business cycle and conditions of competition that are distinctive to the affected industry."[70]

Although the statute requires the Commission to determine whether there is a reasonable indication that the domestic industry is "materially injured by reason of" unfairly

[62] CR at III-10, PR at III-5; and CR/PR at Table D-5.

[63] National Postconference Brief at 16.

[64] National's operating income margin was *** percent in 2012, *** percent in 2013 and 2014, and was *** percent in interim 2014 and *** percent in interim 2015. CR/PR at Table VI-3.

[65] Conference Tr. at 52 (Beatty); National's Postconference Brief at 45.

[66] 19 U.S.C. §§ 1671b(a), 1673b(a).

[67] 19 U.S.C. § 1677(7)(B). The Commission "may consider such other economic factors as are relevant to the determination" but shall "identify each {such} factor ... {a}nd explain in full its relevance to the determination." 19 U.S.C. § 1677(7)(B).

[68] 19 U.S.C. § 1677(7)(A).

[69] 19 U.S.C. § 1677(7)(C)(iii).

[70] 19 U.S.C. § 1677(7)(C)(iii).

traded imports,[71] it does not define the phrase "by reason of," indicating that this aspect of the injury analysis is left to the Commission's reasonable exercise of its discretion.[72] In identifying a causal link, if any, between subject imports and material injury to the domestic industry, the Commission examines the facts of record that relate to the significance of the volume and price effects of the subject imports and any impact of those imports on the condition of the domestic industry. This evaluation under the "by reason of" standard must ensure that subject imports are more than a minimal or tangential cause of injury and that there is a sufficient causal, not merely a temporal, nexus between subject imports and material injury.[73]

In many investigations, there are other economic factors at work, some or all of which may also be having adverse effects on the domestic industry. Such economic factors might include nonsubject imports; changes in technology, demand, or consumer tastes; competition among domestic producers; or management decisions by domestic producers. The legislative history explains that the Commission must examine factors other than subject imports to ensure that it is not attributing injury from other factors to the subject imports, thereby inflating an otherwise tangential cause of injury into one that satisfies the statutory material injury threshold.[74] In performing its examination, however, the Commission need not isolate the injury caused by other factors from injury caused by unfairly traded imports.[75] Nor does the

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[71] 19 U.S.C. §§ 1671b(a), 1673b(a).

[72] *Angus Chemical Co. v. United States*, 140 F.3d 1478, 1484-85 (Fed. Cir. 1998) ("{T}he statute does not 'compel the commissioners' to employ {a particular methodology}."), *aff'g* 944 F. Supp. 943, 951 (Ct. Int'l Trade 1996).

[73] The Federal Circuit, in addressing the causation standard of the statute, has observed that "{a}s long as its effects are not merely incidental, tangential, or trivial, the foreign product sold at less than fair value meets the causation requirement." *Nippon Steel Corp. v. USITC*, 345 F.3d 1379, 1384 (Fed. Cir. 2003). This was re-affirmed in *Mittal Steel Point Lisas Ltd. v. United States*, 542 F.3d 867, 873 (Fed. Cir. 2008), in which the Federal Circuit, quoting *Gerald Metals, Inc. v. United States*, 132 F.3d 716, 722 (Fed. Cir. 1997), stated that "this court requires evidence in the record 'to show that the harm occurred "by reason of" the LTFV imports, not by reason of a minimal or tangential contribution to material harm caused by LTFV goods.'" *See also Nippon Steel Corp. v. United States*, 458 F.3d 1345, 1357 (Fed. Cir. 2006); *Taiwan Semiconductor Industry Ass'n v. USITC*, 266 F.3d 1339, 1345 (Fed. Cir. 2001).

[74] SAA, H.R. Rep. 103-316, Vol. I at 851-52 (1994) ("{T}he Commission must examine other factors to ensure that it is not attributing injury from other sources to the subject imports."); S. Rep. 96-249 at 75 (1979) (the Commission "will consider information which indicates that harm is caused by factors other than less-than-fair-value imports."); H.R. Rep. 96-317 at 47 (1979) ("in examining the overall injury being experienced by a domestic industry, the ITC will take into account evidence presented to it which demonstrates that the harm attributed by the petitioner to the subsidized or dumped imports is attributable to such other factors;" those factors include "the volume and prices of nonsubsidized imports or imports sold at fair value, contraction in demand or changes in patterns of consumption, trade restrictive practices of and competition between the foreign and domestic producers, developments in technology and the export performance and productivity of the domestic industry"); *accord Mittal Steel*, 542 F.3d at 877.

[75] SAA at 851-52 ("{T}he Commission need not isolate the injury caused by other factors from injury caused by unfair imports."); *Taiwan Semiconductor Industry Ass'n* , 266 F.3d at 1345. ("{T}he (Continued ...)

"by reason of" standard require that unfairly traded imports be the "principal" cause of injury or contemplate that injury from unfairly traded imports be weighed against other factors, such as nonsubject imports, which may be contributing to overall injury to an industry.[76] It is clear that the existence of injury caused by other factors does not compel a negative determination.[77]

Assessment of whether material injury to the domestic industry is "by reason of" subject imports "does not require the Commission to address the causation issue in any particular way" as long as "the injury to the domestic industry can reasonably be attributed to the subject imports" and the Commission "ensure{s} that it is not attributing injury from other sources to the subject imports."[78] [79] Indeed, the Federal Circuit has examined and affirmed various Commission methodologies and has disavowed "rigid adherence to a specific formula."[80]

Commission need not isolate the injury caused by other factors from injury caused by unfair imports ... . Rather, the Commission must examine other factors to ensure that it is not attributing injury from other sources to the subject imports." (emphasis in original)); *Asociacion de Productores de Salmon y Trucha de Chile AG v. United States*, 180 F. Supp. 2d 1360, 1375 (Ct. Int'l Trade 2002) ("{t}he Commission is not required to isolate the effects of subject imports from other factors contributing to injury" or make "bright-line distinctions" between the effects of subject imports and other causes.); *see also Softwood Lumber from Canada*, Inv. Nos. 701-TA-414 and 731-TA-928 (Remand), USITC Pub. 3658 at 100-01 (Dec. 2003) (Commission recognized that "{i}f an alleged other factor is found not to have or threaten to have injurious effects to the domestic industry, *i.e*., it is not an 'other causal factor,' then there is nothing to further examine regarding attribution to injury"), *citing Gerald Metals,* 132 F.3d at 722 (the statute "does not suggest that an importer of LTFV goods can escape countervailing duties by finding some tangential or minor cause unrelated to the LTFV goods that contributed to the harmful effects on domestic market prices.").

[76] S. Rep. 96-249 at 74-75; H.R. Rep. 96-317 at 47.

[77] *See Nippon*, 345 F.3d at 1381 ("an affirmative material-injury determination under the statute requires no more than a substantial-factor showing. That is, the 'dumping' need not be the sole or principal cause of injury.").

[78] *Mittal Steel*, 542 F.3d at 877-78; *see also id.* at 873 ("While the Commission may not enter an affirmative determination unless it finds that a domestic industry is materially injured 'by reason of' subject imports, the Commission is not required to follow a single methodology for making that determination ... {and has} broad discretion with respect to its choice of methodology.") *citing United States Steel Group v. United States*, 96 F.3d 1352, 1362 (Fed. Cir. 1996) and S. Rep. 96-249 at 75. In its decision in *Swiff-Train Company v. United States*, Court No. 2014-1814 (Fed. Cir. July 13, 2015), the Federal Circuit affirmed the Commission's causation analysis as comporting with the Court's guidance in *Mittal*.

[79] Vice Chairman Pinkert does not join this paragraph or the following three paragraphs. He points out that the Federal Circuit, in *Bratsk*, 444 F.3d 1369, and *Mittal Steel*, held that the Commission is *required*, in certain circumstances when considering present material injury, to undertake a particular kind of analysis of nonsubject imports, albeit without reliance upon presumptions or rigid formulas. *Mittal Steel* explains as follows:

> What *Bratsk* held is that "where commodity products are at issue and fairly traded, price competitive, non-subject imports are in the market," the Commission would not fulfill

(Continued ...)

The Federal Circuit's decisions in *Gerald Metals*, *Bratsk,* and *Mittal Steel* all involved cases in which the relevant "other factor" was the presence in the market of significant volumes of price-competitive nonsubject imports. The Commission interpreted the Federal Circuit's guidance in *Bratsk* as requiring it to apply a particular additional methodology following its finding of material injury in cases involving commodity products and a significant market presence of price-competitive nonsubject imports.[81] The additional "replacement/benefit" test looked at whether nonsubject imports might have replaced subject imports without any benefit to the U.S. industry. The Commission applied that specific additional test in subsequent cases, including the *Carbon and Certain Alloy Steel Wire Rod from Trinidad and Tobago* determination that underlies the *Mittal Steel* litigation.

Mittal Steel clarifies that the Commission's interpretation of *Bratsk* was too rigid and makes clear that the Federal Circuit does not require the Commission to apply an additional test nor any one specific methodology; instead, the court requires the Commission to have "evidence in the record 'to show that the harm occurred 'by reason of' the LTFV imports,'" and requires that the Commission not attribute injury from nonsubject imports or other factors to subject imports.[82] Accordingly, we do not consider ourselves required to apply the replacement/benefit test that was included in Commission opinions subsequent to *Bratsk*.

The progression of *Gerald Metals*, *Bratsk*, and *Mittal Steel* clarifies that, in cases involving commodity products where price-competitive nonsubject imports are a significant factor in the U.S. market, the Court will require the Commission to give full consideration, with adequate explanation, to non-attribution issues when it performs its causation analysis.[83]

> its obligation to consider an important aspect of the problem if it failed to consider whether non-subject or non-LTFV imports would have replaced LTFV subject imports during the period of investigation without a continuing benefit to the domestic industry. 444 F.3d at 1369. Under those circumstances, *Bratsk* requires the Commission to consider whether replacement of the LTFV subject imports might have occurred during the period of investigation, and it requires the Commission to provide an explanation of its conclusion with respect to that factor.
>
> 542 F.3d at 878.

[80] *Nucor Corp. v. United States*, 414 F.3d 1331, 1336, 1341 (Fed. Cir. 2005); *see also Mittal Steel*, 542 F.3d at 879 ("*Bratsk* did not read into the antidumping statute a Procrustean formula for determining whether a domestic injury was 'by reason' of subject imports.").

[81] *Mittal Steel*, 542 F.3d at 875-79.

[82] *Mittal Steel*, 542 F.3d at 873 (quoting from *Gerald Metals*, 132 F.3d at 722), 875-79 & n.2 (recognizing the Commission's alternative interpretation of *Bratsk* as a reminder to conduct a non-attribution analysis).

[83] To that end, after the Federal Circuit issued its decision in *Bratsk*, the Commission began to present published information or send out information requests in final phase investigations to producers in nonsubject countries that accounted for substantial shares of U.S. imports of subject merchandise (if, in fact, there were large nonsubject import suppliers). In order to provide a more complete record for the Commission's causation analysis, these requests typically seek information on capacity, production, and shipments of the product under investigation in the major source countries (Continued ...)

The question of whether the material injury threshold for subject imports is satisfied notwithstanding any injury from other factors is factual, subject to review under the substantial evidence standard.[84] Congress has delegated this factual finding to the Commission because of the agency's institutional expertise in resolving injury issues.[85]

B. Conditions of Competition and the Business Cycle[86]

The following conditions of competition inform our analysis of whether there is a reasonable indication of material injury or threat of material injury by reason of subject imports.

1. Demand Conditions

Demand for HFC blends in the United States depends on the demand for its use in downstream products. Residential air conditioning is reported to be the largest end use, followed by commercial refrigeration. Other end uses include commercial air conditioning, transport refrigeration, and process refrigeration.[87] Demand is largely driven by the replacement of HCFCs in air conditioning and refrigeration applications, both in new equipment and in existing equipment retrofitted to accept HFC blends.[88] Future U.S. demand for HFCs may be reduced by the development of HFOs. HFOs ("hydrofluoroolefin") are commonly considered the "next generation" of refrigerants and are being developed by the HFC industry to meet

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that export to the United States. The Commission plans to continue utilizing published or requested information in final phase investigations in which there are substantial levels of nonsubject imports.

[84] We provide in our respective discussions of volume, price effects, and impact a full analysis of other factors alleged to have caused any material injury experienced by the domestic industry.

[85] *Mittal Steel*, 542 F.3d at 873; *Nippon Steel Corp*., 458 F.3d at 1350, *citing U.S. Steel Group*, 96 F.3d at 1357; S. Rep. 96-249 at 75 ("The determination of the ITC with respect to causation is ... complex and difficult, and is a matter for the judgment of the ITC.").

[86] Pursuant to Section 771(24) of the Tariff Act, imports from a subject country of merchandise corresponding to a domestic like product that account for less than 3 percent of all such merchandise imported into the United States during the most recent 12 months for which data are available preceding the filing of the petition shall be deemed negligible. 19 U.S.C. §§ 1671b(a), 1673b(a), 1677(24)(A)(i), 1677(24)(B); *see also* 15 C.F.R. § 2013.1 (developing countries for purposes of 19 U.S.C. § 1677(36)). Negligibility is not an issue in this investigation. Based on importer questionnaire responses, subject imports from China exceed the requisite 3 percent statutory negligibility threshold. From June 2014 to May 2015, subject imports from China accounted for 99.0 percent of total U.S. imports of HFC blends and components by quantity. CR at IV-18, PR at IV-6.

[87] CR at II-11 to II-13, PR at II-7; and CR/PR at Table II-3.

[88] CR at I-16, PR at I-11 to I-12.

regulatory mandates to lower the global warming potential of refrigerant gases and eventually to replace subject HFC blends in some applications.[89]

The majority of U.S. producers and importers reported that the U.S. market was subject to business cycles. All companies reported that HFC demand is seasonal with the most demand occurring directly before the summer months. Demand for certain blends used in refrigeration products reportedly are sold steadily throughout the year although some blends are used more in the first eight months of the year when demand for air conditioning units increases.[90]

Apparent U.S. consumption of HFC blends and components increased from *** short tons in 2012 to *** short tons in 2013, and then to *** short tons in 2014. Apparent U.S. consumption was *** short tons in interim 2015, down from *** short tons in 2014.[91]

2. Supply Conditions

Sources of supply to the U.S. market during the POI included the domestic industry, subject imports, and imports from nonsubject sources. The U.S. market for HFC blends and components was satisfied almost entirely by the domestic industry and subject imports during the POI.

The domestic industry's share of the U.S. market decreased throughout the POI, from *** percent in 2012 to *** percent in 2013 and *** percent in 2014, and was *** percent in interim 2014 and *** percent in interim 2015.[92] There were five domestic producers of in-scope HFC components and blends during the POI. Three of these firms (Arkema, Chemours, and Honeywell) are integrated producers that produced both components and blends, while two of the firms (National and Hudson) are independent blenders that produced only HFC blends. The domestic industry's capacity for HFC components and blends increased from 261,235 short tons in 2012 to 262,411 short tons in 2013, before decreasing to 261,977 short

[89] CR at I-26, PR at I-17 to I-18; and CR/PR at Table I-9.

[90] CR at II-13 & V-18, PR at II-7 & V-5.

[91] CR/PR at Table IV-12. In order to report data on apparent U.S. consumption comprising both blends and components without double counting components that are processed into blends, the apparent U.S. consumption data on which we rely reflect U.S. producers' U.S. shipment quantity and represent: (1) U.S. producers' commercial U.S. shipments of HFC components in the United States (excluding any sales to blenders because the blender is reporting a further processed version of that domestic product); (2) U.S. producers' internal consumption of HFC components not accounted for in the production of covered HFC blends (*i.e.*, HFC components used to produce out-of-scope HFC blends); and (3) U.S. producers' U.S. shipments of HFC blends in the United States (excluding the amount produced from imported components). *See* CR at IV-19 & n.8, PR at IV-7 & n.8; and CR/PR at Table C-1.

[92] CR/PR at Tables IV-12 and C-1. As explained earlier, the Commission's report adjusted domestic shipment data to avoid double-counting in calculating the domestic industry's share of apparent U.S. consumption.

tons in 2014.[93] The domestic industry exported a significant portion of its HFC component production during the POI.[94]

At least two HFC components are needed to produce any of the HFC blends within the scope. No single U.S. producer manufactures all four of the HFC components, including out-of-scope R-134a, that are necessary to produce the five in-scope HFC blends, given the high cost of producing HFC components.[95] As a result, each of the three integrated producers engaged in swap arrangements with other integrated producers to acquire the HFC components that it does not produce. The integrated HFC producers also swap the three components within the scope for R-134a, which is outside the scope, because R-134a is used as a component in the production of three of the five in-scope HFC blends. Additionally, all three integrated producers, as well as both independent blenders, imported or purchased the HFC components necessary to produce HFC blends.[96]

Given the somewhat limited domestic production of in-scope components and the limited uses outside of the subject blends, most subject imports of HFC components were purchased by domestic producers of HFC blends, including the integrated producers. Subject imports' market share increased from *** percent in 2012 to *** percent in 2013, and then to *** percent in 2014, and was *** percent in interim 2014 and *** percent in interim 2015.[97]

Nonsubject imports had a minimal presence in the U.S. market during the POI. Their share of apparent U.S. consumption increased from *** percent in 2012 to *** percent in 2013 and then declined to *** percent in 2014. It was *** percent in interim 2014 and *** percent in interim 2015.[98] The largest nonsubject sources of HFC blends during the POI was *** and for HFC components were ***.[99]

3. Substitutability and Other Conditions

For the purposes of the preliminary phase of this investigation, we find that there is a high degree of substitutability between the domestic like product and subject imports. All responding U.S. producers and the majority of importers reported that domestically produced

[93] Calculated from CR/PR at Table III-3. The domestic industry's capacity for components and blends was *** short tons in interim 2014 and *** short tons in 2015. *Id*.

[94] Domestic producers' exports of HFC components, as a percentage of total shipments, decreased from *** percent in 2012 to *** percent in 2014, and were *** percent in first quarter 2015. Domestic producers' exports of blends, as a percentage of total shipments, Increased from *** percent in 2012 to *** percent in 2014, and were *** percent in the first quarter of 2015. CR at II-6, PR at II-3 to II-4.

[95] Conference Tr. at 18 (Cannon), 31 (Sassano).

[96] CR at III-8, PR at III-4.

[97] CR/PR at Tables IV-12 and C-1; *see also* CR at IV-19 & n.8, PR at IV-7 & n.8.

[98] CR/PR at Tables IV-12 and C-1; *see also* CR at IV-19 & n.8, PR at IV-7 & n.8.

[99] CR at II-10 to II-11, PR at II-4.

HFCs, subject imports, and nonsubject imports, whether components or blends, are "always" or "frequently" interchangeable.[100] When asked about the significance of differences other than price between domestically produced HFCs and subject imports, most U.S. producers and importers reported that differences other than price between country pairs were "sometimes" or "never" significant.[101] Based on the record of the preliminary phase of this investigation, we find that price is an important factor in purchasing decisions.

The primary raw material used to produce HFC components is hydrofluoric acid ("HF acid"). While the cost of HF acid increased over the POI,[102] cost trends for other raw material inputs to HFC components varied.[103] The average total raw material cost per short ton for internally produced components for the three integrated HFC producers decreased by *** percent during 2012-2014.[104] The primary raw materials used to produce the subject HFC blends are the in-scope HFC components and R-134a.[105]

C. Volume of Subject Imports

Section 771(7)(C)(i) of the Tariff Act provides that the "Commission shall consider whether the volume of imports of the merchandise, or any increase in that volume, either in absolute terms or relative to production or consumption in the United States, is significant."[106]

Subject imports had an increasing presence in the U.S. market during the POI. The volume of subject imports increased steadily from 2012 to 2014. Subject import volume increased from *** short tons in 2012 to *** short tons in 2013, and then increased further to *** short tons in 2014.[107] Thus, subject imports increased *** percent overall from 2012 to 2014, while apparent U.S. consumption increased *** percent during that time.[108]

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[100] CR at II-16, PR at II-10, and CR/PR at Table II-5.

[101] CR at II-17 to II-18, PR at II-10 to II-11; and CR/PR at Table II-6.

[102] CR/PR at V-1.

[103] CR/PR at V-1

[104] Calculated from CR/PR at Table VI-4.

[105] CR/PR at V-1.

[106] 19 U.S.C. § 1677(7)(C)(i).

[107] CR/PR at Tables IV-12 and C-1. The volume of subject imports was *** short tons in interim 2014 and *** short tons in interim 2015. *Id*.

[108] CR/PR at Table IV-12. We acknowledge that much of the increase in subject imports was due to an increase in subject component imports. *See* CR/PR at Table IV-2. As previously discussed, domestic producers of HFC blends accounted for the bulk of subject component imports. Nevertheless, there was a substantial increase in subject imports not attributable to increased imports of components by domestic blenders. Imports of subject blends increased by *** percent between 2012 and 2014. Calculated from CR/PR at Table IV-3. Moreover, the increase in subject imports (components and blends) not attributable to domestic producers between 2012 and 2014 was *** percent. CR/PR at Table IV-13.

The share of apparent U.S. consumption held by subject imports, by quantity, also increased steadily overall from 2012 to 2014. The subject imports' share of the market increased from *** percent in 2012 to *** percent in 2013, and increased further to *** percent in 2014.[109] The overall growth in subject imports' market share represents an increase of *** percentage points from 2012 to 2014.[110] The subject imports' growing market share came almost entirely at the expense of the domestic industry as nonsubject imports had a very small presence in the U.S. market throughout the POI. The domestic industry's market share, by quantity, decreased from *** percent in 2012 to *** percent in 2013 and then to *** percent in 2014, representing an overall decline of *** percentage points.[111] The market share of nonsubject imports decreased *** percentage points from 2012 to 2014.[112]

We find, for the purpose of the preliminary phase of this investigation, that the volume of subject imports, and the increase in that volume, is significant in absolute terms and relative to consumption in the United States.

D. Price Effects of Subject Imports

Section 771(7)(C)(ii) of the Tariff Act provides that, in evaluating the price effects of subject imports, the Commission shall consider whether –

> (I) there has been significant price underselling by the imported merchandise as compared with the price of domestic like products of the United States, and
>
> (II) the effect of imports of such merchandise otherwise depresses prices to a significant degree or prevents price increases, which otherwise would have occurred, to a significant degree.[113]

The record in the preliminary phase of this investigation indicates that there is a high degree of substitutability between subject imports and the domestic like product and that price is an important consideration in purchasing decisions. As explained above, all U.S. producers and the majority of importers responding to the Commission's questionnaires reported that

[109] CR/PR at Tables IV-12 and C-1. The share of apparent U.S. consumption held by subject imports was *** percent in interim 2014 and *** percent in interim 2015. *Id*.

[110] CR/PR at Tables IV-12 and C-1. The growth in subject imports' market share was *** percentage points from interim 2014 to interim 2015. *Id*.

[111] CR/PR at Tables IV-12 and C-1. The domestic industry's market share decreased *** percentage points from interim 2014 to interim 2015. *Id*.

[112] CR/PR at Tables IV-12 and C-1. Nonsubject imports' market share decreased *** percentage points from interim 2014 to interim 2015. *Id*.

[113] 19 U.S.C. § 1677(7)(C)(ii).

domestically produced HFCs, subject imports, and nonsubject imports are "always" or "frequently" interchangeable.[114]

The Commission collected quarterly pricing data for HFC components and blends sold pursuant to contracts and spot sales.[115] We have given more weight to comparisons regarding the prices of subject import HFC blends than the data for HFC components because there is very little importer pricing data for components due to the small quantities of HFC components resold by importers. The record contains substantial data on the cost of direct imports of subject HFC components, but we have given these data limited weight in our analysis because most of these direct imports were made by the domestic producers themselves.[116]

Overall, subject imports undersold the domestic like product in 44 of 55 quarterly comparisons involving sales to unrelated U.S. customers with margins of underselling ranging from 1.6 percent to 55.2 percent and margins of overselling ranging from 0.2 percent to 97.9 percent. Specifically with respect to HFC blends, however, subject imports undersold the domestically produced blends in 41 of 46 quarterly comparisons with margins of underselling ranging from 1.6 percent to 42.7 percent and margins of overselling ranging from 0.2 percent to 5.2 percent.[117] This significant underselling occurred while the subject imports gained substantial market share at the expense of the domestic industry. Given the high degree of substitutability between the domestic like product and the subject imports and the importance of price in purchasing decisions, we find this underselling to be significant for the purposes of this preliminary determination.[118]

We have also considered changes in domestic and subject import prices over the period of investigation. Domestic producer and U.S. importer prices decreased during the POI. The declines in the domestic industry's sales prices of HFC blends (products 1-4) ranged between 24.6 percent and 48.9 percent during the POI while the sales prices of subject imports of HFC blends decreased by 14.0 to 49.2 percent. The domestic industry's sales prices of HFC components (products 5-6) decreased by 3.5 percent to 48.3 percent during the POI while the

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[114] CR/PR at Table II-5.

[115] The Commission sought pricing data on six products, including four HFC blend products (R-410A in bulk containers; R-410A in 25 lb. disposable tanks or cylinders; R-404A in 24 lb. disposable tanks or cylinders; R-407C in 25 lb. disposable tanks or cylinders) and two HFC component products (R-32 in bulk containers and R-125 in bulk containers). The Commission collected data on both sales and direct imports of the pricing products; sales price information constituted the bulk of the data for imports of the four HFC blend products, and direct import cost information constituted the overwhelming share of the data for imports of the two HFC component products. *See* CR at V-4 to V-5, PR at V-3 to V-4.

[116] CR at IV-21, PR at IV-7; and CR/PR at Table IV-13; *see also* CR at V-21 to V-22, PR at V-7.

[117] CR/PR at Table V-10.

[118] We have also considered the domestic industry's lost sales and lost revenue allegations. There were no responses to many of the allegations. CR/PR at Tables VI-11 to VI-12. There were *** confirmed lost sales ***. CR/PR at Table V-11. Additionally, two responding purchasers indicated that price was the reason they switched from U.S. producers to subject imports since 2012, and two responding producers stated that the U.S. producers had reduced their prices since 2012 to compete with subject imports. CR at V-23, PR at V-8.

sales prices of subject imports of HFC components decreased by 31.8 percent to 57.8 percent.[119] The domestic industry's prices declined notwithstanding the increase in apparent U.S. consumption.[120] Moreover, these price declines were much more severe than the declines in the domestic industry's unit cost-of-goods sold ("COGS").[121] Therefore, for the purposes of this preliminary determination, we find that subject imports have depressed prices to a significant degree.

Both National and the Chinese respondents argued that U.S. prices for HFC components and blends were influenced during the period of investigation both by a shortage of R-125 and R-134a during 2010 and 2011 and by the expiration of patents on subject HFC blends during the 2009 to 2011 period.[122] We intend to explore further any possible lingering effects of supply shortages and the expiration of patents on subject blends in any final phase of this investigation.

E. Impact of Subject Imports[123]

Section 771(7)(C)(iii) of the Tariff Act provides that the Commission, in examining the impact of the subject imports on the domestic industry, "shall evaluate all relevant economic factors which have a bearing on the state of the industry." These factors include output, sales, inventories, capacity utilization, market share, employment, wages, productivity, gross profits, net profits, operating profits, cash flow, return on investment, return on capital, ability to raise capital, ability to service debt, research and development, and factors affecting domestic prices. No single factor is dispositive and all relevant factors are considered "within the context of the business cycle and conditions of competition that are distinctive to the affected industry."[124]

Although the domestic industry increased its output and employment during a period of rising apparent U.S. consumption, it lost market share notwithstanding unused capacity, and its indicators of financial performance were generally negative. The domestic industry's total production capacity increased from *** short tons in 2012 to *** short tons in 2013, before decreasing to *** short tons in 2014.[125] Its production of the blends and components within

[119] CR/PR at Table V-9.

[120] See CR/PR at Table C-1.

[121] *Compare* CR/PR at Table V-9 with *id*. at Table VI-1.

[122] *See* National Postconference Brief at 27 and Exhibit 1 at 2; Chinese Respondents' Postconference Brief at 15.

[123] In its notice initiating the antidumping duty investigation on hydrofluorocarbon blends and components thereof from China, Commerce reported estimated dumping margins ranging from 111.20 to 300.30 percent. *Hydrofluorocarbons and Components Thereof from the People's Republic of China: Initiation of Less-Than-Fair Value Investigation*, 80 Fed. Reg. 43387, 43390 (July 22, 2015).

[124] 19 U.S.C. § 1677(7)(C)(iii). This provision was recently amended by the Trade Preferences Extension Act of 2015, Pub. L. 114-27.

[125] Calculated from CR/PR at Tables III-3 and C-1. The domestic industry's capacity was *** short tons in interim 2014 and was *** short tons in interim 2015. *Id*.

the scope increased from *** short tons in 2012 to *** short tons in 2013 and *** short tons 2014.[126] The domestic industry's capacity utilization increased from *** percent in 2012 to *** percent in 2013, and then decreased to *** percent in 2014.[127] The domestic industry's shipments, by quantity, increased from *** short tons in 2012 to *** short tons in 2013, and then decreased to *** short tons in 2014, representing an overall decrease from 2012 to 2014 of *** percent.[128] Domestic producers' inventories increased from 2012 to 2014.[129] As

[126] Production of these HFC blends and components was *** short tons in interim 2014 and *** short tons in interim 2015. Calculated from CR/PR at Tables D-1 though D-5 (production figures calculated for components excluding R-134a). The domestic industry's production of HFC components was *** short tons in 2012, *** short tons in 2013, and *** short tons in 2014, and was *** short tons in interim 2014 and *** short tons in interim 2015. The domestic industry's production of HFC blends was *** short tons in 2012, *** short tons in 2013, and *** short tons 2014, and was *** short tons in interim 2014 and *** short tons in interim 2015. *Id*.

[127] Calculated from CR/PR at Table III-3. The domestic industry's capacity utilization was *** percent in interim 2014 and *** percent in interim 2015. *Id*. The domestic industry's capacity utilization for components increased from *** percent in 2012 to *** percent in 2013, and then decreased to *** percent in 2014, and was *** percent in interim 2014 and *** percent in interim 2015. The domestic industry's capacity utilization for blends increased from *** percent in 2012 to *** percent in 2013, and then to *** percent in 2014, and was *** percent in interim 2014 and *** percent in interim 2015. CR/PR at Table III-3.

[128] CR/PR at Table IV-12. The domestic industry's shipments, by quantity, were *** short tons in interim 2014 and at a lower figure, *** short tons, in interim 2015. The figures for combined U.S. shipments of blends and components eliminate double counting between levels of production and any components used to produce U.S. blends. These data also do not include any commercially sold R-134a, which is not included within the domestic like product. *Id*.; *see also* CR/PR at Table C-1 n.3.

The total value of the U.S. producers' export shipments of HFC components decreased by $*** during 2012-2014 as the quantity and unit value decreased. Export quantities decreased from *** short tons in 2012 to *** short tons in 2014 while the average unit value decreased from $*** per short ton to $*** per short ton. Domestic producers' export shipments of HFC blends and components increased from *** short tons in 2012 to *** short tons in 2013, and then to *** short tons 2014, and were *** short tons in interim 2014 and *** short tons in interim 2015. As a percentage of total shipments, they were *** percent in 2014, *** percent in 2013, and *** percent in 2014, and were *** percent in interim 2014 and *** percent in interim 2015. CR/PR at Table III-8. We will revisit the effect of exports on the condition of the domestic industry in any final phase of this investigation.

[129] The domestic industry's end-of-period inventories for components were *** short tons in 2012, *** short tons in 2013, and *** short tons in 2014, and were *** short tons in interim 2014 and *** short tons in interim 2015. The ratio of inventories to total shipments of components was *** percent in 2012, *** percent in 2013, and *** percent in 2014, and were *** percent in interim 2014 and *** percent in interim 2015. The domestic industry's end-of-period inventories for blends were *** short tons in 2012, *** short tons in 2013, and *** short tons in 2014, and were *** short tons in interim 2014 and *** short tons in interim 2015. The ratio of inventories to total shipments of blends was *** percent in 2012, *** percent in 2013, and *** percent in 2014, and were *** percent in interim 2014 and *** percent in interim 2015. CR/PR at Table III-11.

previously discussed, the domestic industry's share of apparent U.S. consumption declined from *** percent in 2012 to *** percent in 2014.[130]

The domestic industry's total number of production and related workers ("PRWs") increased from *** in 2012 to *** in 2013, and then to *** in 2014.[131] Hours worked[132] and wages paid[133] also increased from 2012 to 2014, although productivity[134] decreased and unit labor costs increased steadily over the period.[135]

The domestic industry's financial performance deteriorated significantly over the POI. Although sales volume increased, revenues and operating income both declined. From 2012 to 2014, although net sales by quantity increased by *** percent, net sales value decreased by *** percent.[136] The unit value of net sales per short ton also decreased by *** percent from 2012 to 2014.[137] The domestic industry's operating income decreased from *** in 2012 to *** in 2013, and then to *** in 2014, and was *** in interim 2014 and *** in interim 2015.[138] The domestic industry's ratio of operating income to net sales decreased from *** percent in 2012

[130] CR/PR at Table IV-12. The domestic industry's share of apparent U.S. consumption was lower in interim 2015, when it was *** percent, than in interim 2014 when it was *** percent. *Id*.

[131] Calculated from CR/PR at Table III-13. PRWs were *** in interim 2014 and *** in interim 2015. *Id*.

[132] Combined hours worked were *** in 2012, *** in 2013, and *** in 2014, and were *** in interim 2014 and *** in interim 2015. Calculated from CR/PR at Table III-13.

[133] Combined wages paid were $*** in 2012, $*** in 2013, and $*** in 2014, and were $*** in interim 2014 and $*** in interim 2015. Calculated from CR/PR at Table III-13.

Hourly wages paid to component PRWs were $*** in 2012, $*** in 2013, and $*** in 2014, and were $*** in interim 2014 and $*** in interim 2015. Hourly wages paid to blend PRWs were $*** in 2012, $*** in 2013, and $*** in 2014, and were $*** in interim 2014 and $*** in interim 2015. CR/PR at Table III-13.

[134] Productivity (short tons per 1000 hours) for components was *** in 2012, *** in 2013, and *** in 2014, and was *** in interim 2014 and *** in interim 2015. Productivity (short tons per 1000 hours) for blends was *** in 2012, *** in 2013, and *** in 2014, and was *** in interim 2014 and *** in interim 2015. CR/PR at Table III-13.

[135] Unit labor costs (dollars per short ton) for components were $*** in 2012, $*** in 2013, and $*** in 2014, and were $*** in interim 2014 and $*** in interim 2015. Unit labor costs (dollars per short ton) for blends were $*** in 2012, $*** in 2013, and $*** in 2014, and were $*** in interim 2014 and $*** in interim 2015. CR/PR at Table III-13.

[136] CR/PR at Table C-1. Net sales by quantity increased from *** in 2012 to *** in 2013, and then to *** in 2014, and were *** in interim 2014 and *** in interim 2015. Net sales value decreased from $475.7 million in 2012 to $415.3 million in 2013, and then to $402.3 million in 2014, and was $104.3 million in interim 2014 and $90.4 million in interim 2015. *Id*.

[137] Unit value of net sales per short ton decreased from $*** in 2012 to $*** in 2013, to $*** in 2014, and was $*** in interim 2014 and $*** in interim 2015. CR/PR at Table C-1.

[138] CR/PR at VI-1. The domestic industry's gross profit was $*** in 2012, $*** in 2013, and $*** in 2014, and was $*** in interim 2014 and $*** in interim 2015. The domestic industry's net income was $*** in 2012, $*** in 2013, and $*** in 2014, and was $*** in interim 2014 and $*** in interim 2015. *Id*.

to *** percent in 2013 to *** percent in 2014, and was *** percent in interim 2014 and *** percent in interim 2015.[139]

The domestic industry's capital expenditures decreased from $*** in 2012 to $*** in 2013, and then to $*** in 2014, and were $*** in interim 2014 and $*** in interim 2015.[140] Research and development expenses decreased from $*** in 2012 to $*** in 2013, and then to $*** in 2014, and were $*** in interim 2014 and $*** in interim 2015. [141]

The significant volume of subject imports took market share from the domestic industry. The subject imports, which significantly undersold the domestic like product, also caused significant price depression as reflected in both the pricing data the Commission collected and the decreasing unit value of shipments during the POI.[142] As a result of both lost market share and declining prices, the domestic industry's revenues were lower than they would have been otherwise and did not increase commensurately with rising apparent U.S. consumption. The lower revenues, in turn, resulted in reduced gross, operating, and net profits,[143] as well as a negative operating ratio.[144] In light of the foregoing, we find that subject imports had a significant impact on the domestic industry.

We have also examined the role of nonsubject imports. As discussed above, nonsubject imports had only a minimal presence in the U.S. market during the POI. Their share of apparent U.S. consumption increased from *** percent in 2012 to *** percent in 2013, before decreasing to *** percent in 2014.[145] In light of the small and declining presence of nonsubject imports during the POI, we find that nonsubject imports are not responsible for the observed declines in the domestic industry's market share, revenues, and financial performance.[146]

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[139] CR/PR at Table VI-1.

[140] CR/PR at Table VI-5.

[141] CR/PR at Table VI-5.

[142] CR/PR at Tables V-9, VI-1.

[143] As noted earlier, the domestic producers exported a significant amount of their HFC production during the POI. *See* CR at II-6, PR at II-3 to II-4. We will analyze the effects of these exports on the industry's profitability in any final phase of this investigation.

[144] The Chinese respondents also contend that the domestic industry's financial performance recovered in interim 2015, notwithstanding continued subject import competition, with an operating income margin of negative *** percent, up from negative *** percent in interim 2014. Chinese Respondents' Postconference Brief at 38. We observe that, notwithstanding this purported improvement, the domestic industry still had *** operating and net income in interim 2015. Moreover, the interim 2015 data reflects only one quarter of financial data and is not necessarily indicative of a trend. We will examine the industry's financial data for 2015 in any final phase of this investigation.

[145] CR/PR at Table C-1. Nonsubject imports market share was *** percent in interim 2014 and *** percent in interim 2015. *Id*.

[146] Vice Chairman Pinkert does not undertake a *Bratsk/Mittal Steel* analysis in this investigation as he does not find that subject imports were a significant factor in the U.S. market.

VI. Conclusion

For the foregoing reasons, we determine that there is a reasonable indication that an industry in the United States is materially injured by reason of subject imports of hydrofluorocarbon blends and components thereof from China allegedly sold in the United States at less than fair value.

PART I: INTRODUCTION

BACKGROUND

This investigation results from a petition filed on June 25, 2015, with the U.S. Department of Commerce ("Commerce") and the U.S. International Trade Commission ("USITC" or "Commission") by the American HFC Coalition, and its members: Amtrol, Inc. ("Amtrol"), West Warwick, Rhode Island; Arkema, Inc. ("Arkema"), King of Prussia, Pennsylvania; The Chemours Company FC LLC ("Chemours"), Wilmington, Delaware; Honeywell International Inc. ("Honeywell"), Morristown, New Jersey; Hudson Technologies ("Hudson"), Pearl River, New York; Mexichem Fluor Inc. ("Mexichem"), St. Gabriel, Louisiana; Worthington Industries, Inc. ("Worthington"), Columbus, Ohio); and District Lodge 154 of the International Association of Machinists and Aerospace Workers ("IAMAW"),[1] alleging that an industry in the United States is materially injured and threatened with material injury by reason of less-than-fair-value ("LTFV") imports of certain hydrofluorocarbon blends and of certain single hydrofluorocarbon components ("HFC")[2] imported from China. The following tabulation provides information relating to the background of this investigation.[3][4]

[1] The Commission did not grant Amtrol and Worthington interested party status because neither qualifies as an interested party under 19 § U.S.C. 177(9).

[2] See the section entitled "The Subject Merchandise" in *Part I* of this report for a complete description of the merchandise subject to this investigation. Throughout this report, "HFC" refers to all of the data gathered on each of the covered HFC blends (R-404A, R-407A, R-407C, R410A, and R-507A) and the individual HFC components (R-32, R-125, R-134a, and R-143) used to produce those blends. Data were gathered on R-134a as it was a major input into the production of three of the five covered HFC blends, although this individual HFC component was excluded from the scope of this investigation when not incorporated into a covered HFC blend. The term "covered HFC components" refers to the three individually subject HFC components (R-32, R-125, and R-143, but excluding R-134a). "U.S. producers" refer to any of the five (5) entities that reported production of any of the covered HFC blends and/or any of the covered HFC components over the period of investigation. The U.S. producers in this investigation are: (1) Arkema; (2) Chemours; (3) Honeywell; (4) Hudson; and (5) National Refrigerants Inc. ("National"). Only three of these U.S. producers reported production of HFC components in the United States, and these firms are referred to as "U.S. component producers" or "integrated producers" (Arkema, Chemours, and Honeywell). The label "independent U.S. blenders" refer to the two U.S. producers reporting only HFC blend production and no component production (***). All five U.S. producers, however, reported blending operations on covered HFC blends, and are therefore are included in all data referencing covered HFC blends.

[3] Pertinent *Federal Register* notices are referenced in appendix A, and may be found at the Commission's website (www.usitc.gov).

[4] A list of witnesses appearing at the conference is presented in app. B of this report.

Effective date	Action
June 25, 2015	Petition filed with Commerce and the Commission; institution of Commission investigation (80 FR 38231, July 2, 2015)
July 16, 2015	Commission's conference
July 22, 2015	Commerce's notice of initiation (80 FR 43387)
August 7, 2015	Commission's vote
August 10, 2015	Commission's determination
August 17, 2015	Commission's views

STATUTORY CRITERIA AND ORGANIZATION OF THE REPORT

Statutory criteria

Section 771(7)(B) of the Tariff Act of 1930 (the "Act") (19 U.S.C. § 1677(7)(B)) provides that in making its determinations of injury to an industry in the United States, the Commission--

> *shall consider (I) the volume of imports of the subject merchandise, (II) the effect of imports of that merchandise on prices in the United States for domestic like products, and (III) the impact of imports of such merchandise on domestic producers of domestic like products, but only in the context of production operations within the United States; and. . . may consider such other economic factors as are relevant to the determination regarding whether there is material injury by reason of imports.*

Section 771(7)(C) of the Act (19 U.S.C. § 1677(7)(C)) further provides that--

> *In evaluating the volume of imports of merchandise, the Commission shall consider whether the volume of imports of the merchandise, or any increase in that volume, either in absolute terms or relative to production or consumption in the United States is significant.*
> *. . .*
> *In evaluating the effect of imports of such merchandise on prices, the Commission shall consider whether. . .(I) there has been significant price underselling by the imported merchandise as compared with the price of domestic like products of the United States, and (II) the effect of imports of such merchandise otherwise depresses prices to a significant degree or prevents price increases, which otherwise would have occurred, to a significant degree.*
> *. . .*

In examining the impact required to be considered under subparagraph (B)(i)(III), the Commission shall evaluate (within the context of the business cycle and conditions of competition that are distinctive to the affected industry) all relevant economic factors which have a bearing on the state of the industry in the United States, including, but not limited to . . . (I) actual and potential decline in output, sales, market share, profits, productivity, return on investments, and utilization of capacity, (II) factors affecting domestic prices, (III) actual and potential negative effects on cash flow, inventories, employment, wages, growth, ability to raise capital, and investment, (IV) actual and potential negative effects on the existing development and production efforts of the domestic industry, including efforts to develop a derivative or more advanced version of the domestic like product, and (V) in {an antidumping investigation}, the magnitude of the margin of dumping.

Organization of report

Part I of this report presents information on the subject merchandise, alleged dumping margins, and domestic like product. *Part II* of this report presents information on conditions of competition and other relevant economic factors. *Part III* presents information on the condition of the U.S. industry, including data on capacity, production, shipments, inventories, and employment. *Parts IV* and *V* present the volume of subject imports and pricing of domestic and imported products, respectively. *Part VI* presents information on the financial experience of U.S. producers. *Part VII* presents the statutory requirements and information obtained for use in the Commission's consideration of the question of threat of material injury as well as information regarding nonsubject countries.

MARKET SUMMARY

HFCs are generally used as refrigerants in refrigeration and air conditioning. The U.S. producers of HFCs are Arkema, Chemours, Honeywell, Hudson, and National. Outside the United States, China has the most production of HFC and the leading producers there include: Arkema Daikin Advanced Fluorochemicals (Changshu) Co., Ltd. ("Arkema Daikin"); Jinhua Yonghe Fluorochemical Co., Ltd. ("Jihua Yonghe"); Shandong Dongyue Chemical Co., Ltd. ("Shangdong Dongyue"); Sinochem Environmental Protection Chemicals (Taicang) Co., Ltd. ("Sinochem Taicang"); Weitron International Refrigeration Equipment (Kunshan) Co. Ltd. ("Weitron Kunshan"); Zhejiang Lantian Environmental Protection Fluoro Material Co., Ltd. ("Zhejiang Lantian"); Zhejiang Quzhou Juxin Fluor-Chemistry Co., Ltd. ("Zhejiang Quzhou Juxin"); Zhejiang Quzhou Lianzhou Refrigerants Co., Ltd. ("Zhejiang Quzhou Lianzhou"); Zhejiang Sanmei Chemical Ind. Co., Ltd. ("Zhejiang Sanmei"); and, Zhejiang Yonghe Refrigerant Co., Ltd. ("Zhejiang Yonghe") in China. The leading U.S. importers of HFC components from China are ***, while the leading importers of HFC blends from China are ***) are *** and the only importer of HFC blends from a nonsubject country (***) is ***.

Apparent U.S. consumption of HFC totaled approximately *** short tons ($***) by value in 2014. Currently, three firms are known to produce HFC components in the United States (Arkema, Chemours, and Honeywell) and at least five firms are known to produce the covered HFC blends in the United States (Arkema, Chemours, Honeywell, Hudson and National) in the United States. For apparent consumption, U.S. producers' U.S. shipments of HFC totaled *** short tons ($***) by value in 2014, and accounted for 67 percent of apparent U.S. consumption by quantity and 77 percent by value (some of this value relate to further processing of subject imports of HFC). U.S. imports from China totaled *** short tons ($***) by value in 2014 and accounted for 33 percent of apparent U.S. consumption by quantity and 23 percent by value. U.S. imports from nonsubject sources totaled *** short tons ($***) by value in 2014 and accounted for *** percent of apparent U.S. consumption by both quantity and value.

SUMMARY DATA AND DATA SOURCES

A summary of data collected in this investigation is presented in appendix C, table C-1. Except as noted, U.S. industry data are based on the questionnaire responses of five firms that accounted for all known U.S. production of HFC components and most of the U.S. production of HFC blends during 2014.[5] U.S. imports are based on the questionnaire responses of fourteen U.S. importers of HFC. Information on the industry in China is based on the questionnaire responses of thirteen HFC producers/exporters in China.

PREVIOUS AND RELATED INVESTIGATIONS

Out-of-scope HFC component, 1,1,1,2-tetrafluoroethane (also known as "R-134a"), has been the subject of prior countervailing and antidumping duty investigations in the United States. The investigation on R-134a was filed by Mexichem Fluor Inc. ("Mexichem"), St. Gabriel, Louisiana on October 22, 2013. In December 2014, the Commission determined that an industry in the United States was not materially injured or threatened with material injury, and the establishment of an industry in the United States was not materially retarded, by reason of imports of 1,1,1,2-tetrafluoroethane from China.[6] Mexichem subsequently appealed the Commission's negative determinations to the U.S. Court of International Trade, *Mexichem v. United States*, Court No. 15-00004, filing its complaint on February 4, 2015.

In addition, R-134a has also been the subject of a Commission section 337 investigation, instituted on December 31, 2007. It was based on a complaint filed by INEOS Fluor Holdings

[5] HFC reclaimers (also known as recyclers) can also blend the subject HFC blends in their facilities. Three U.S. producers of HFC (Arkema, Honeywell, and National) are involved in the recycling and reclaiming of HFC. Conference transcript, p. 114 (Haun) and (Irani) and p. 150 (Beatty). No data was provided by HFC reclaimers or recyclers in this investigation, but Kenneth M. Ponder, President, Choice Refrigerants, noted that there are "roughly 53 reclamation facilities licensed by the EPA" for HFC. Conference transcript, pp. 150-151 (Ponder).

[6] 1,1,1,2—Tetrafluoroethane from China, Investigation Nos. 701-TA-509 and 731-TA-1244 (Final)

Ltd.[7] [8] The complaint alleged violations of section 337 by reason of infringement of various process patents used in the manufacture of R–134a and named Sinochem as the respondent. On December 1, 2008, the ALJ determined that Sinochem had violated section 337. On June 1, 2009, the Commission determined to review the remand determination and reversed the conclusion of nonobviousness of the patent infringement claims finding that the claim would have been obvious to one of ordinary skill in the art and was therefore invalid. With its finding of no patent infringement, the Commission terminated its 337 investigation on R-134 in 2009.[9]

NATURE AND EXTENT OF ALLEGED SALES AT LTFV

Alleged sales at LTFV

On July 22, 2015, Commerce published a notice in the *Federal Register* of the initiation of its antidumping duty investigation on HFC from China.[10] Commerce has initiated an antidumping duty investigation based on estimated dumping margins for HFC from China range from 111.20 to 300.30 percent.

[7] *In the Matter of Certain R-134a Coolant (Otherwise Known as 1,1,1,2—Tetrafluoroethane*), ITC Publication No. 4150 (December 2010).

[8] In April 2010, INEOS Fluor Holdings, Ltd. sold its refrigerant business to Mexichem.

[9] *In the Matter of Certain R–134a Coolant (Otherwise Known as 1,1,1,2-Tetrafluoroethane); Notice of Commission Determination To Reverse the Remand Determination of the Presiding Administrative Law Judge and To Terminate the Investigation in Its Entirety With a Finding of No Violation*, 74 FR 39968, August 10, 2009.

[10] *Hydrofluorocarbon Blends and Components Thereof from the People's Republic of China: Initiation of Less-Than-Fair-Value Investigation ("Initiation Notice")*, 80 FR 43387, July 22, 2015.

THE SUBJECT MERCHANDISE

Commerce's scope[11]

Commerce has defined the scope of this investigation as follows:

> The products subject to this investigation are blended hydrofluorocarbons (HFCs) and single HFC components of those blends thereof, whether or not imported for blending. HFC blends covered by the scope are R-404, a zeotropic mixture consisting of 52 percent 1,1,1-Trifluoroethane, 44 percent Pentafluoroethane, and 4 percent 1,1,1,2-Tetrafluoroethane; R-407A, a zeotropic mixture of 20 percent Difluoromethane, 40 percent Pentafluoroethane, and 40 percent 1,1,1,2-Tetrafluoroethane; R-407C, a zeotropic mixture of 23 percent Difluoromethane, 25 percent Pentafluoroethane, and 52 percent 1,1,1,2-Tetrafluoroethane; R-410A, a zeotropic mixture of 50 percent Difluoromethane and 50 percent Pentafluoroethane; and R-507A, an azeotropic mixture of 50 percent Pentafluoroethane and 50 percent 1,1,1-Trifluoroethane also known as R-507. The foregoing percentages are nominal percentages by weight. Actual percentages of single component refrigerants by weight may vary by plus or minus two percent points from the nominal percentage identified above.
>
> The single component HFCs covered by the scope are R-32, R-125, and R-143a. R-32 or Difluoromethane has the chemical formula CH2F2, and is registered as CAS No. 75-10-5. It may also be known as HFC-32, FC-32, Freon-32, Methylene difluoride, Methylene fluoride, Carbon fluoride hydride, halocarbon R32, fluorocarbon R32, and UN 3252. R-125 or 1,1,1,2,2-Pentafluoroethane has the chemical formula CF3CHF2 and is registered as CAS No. 354-33-6. R-125 may also be known as R-125, HFC-125, Pentafluoroethane, Freon 125, and Fc-125, R-

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[11] Commerce requested scope comments regarding the following provision in the petition and did not adopt the provision for the purposes of initiation because "the additional language has presented the Department with some novel and complex issues with respect to administering any potential AD order ." Initiation Notice,, 80 FR 43387.

> This investigation includes any Chinese HFC components that are blended in a third country to produce a subject HFC blend before being imported into the United States. Also included are semi-finished blends of Chinese HFC components. Semi-finished blends are blends of one or more of the single component Chinese HFCs used to produce the subject HFC blends, whether or not blended in China or a third country, that have not been blended to the specific proportions required to meet the definition of one of the subject HFC blends described above (R-404A, R-407A, R-407C, R-410A, and R-507A). Single component HFCs and semi-finished HFC blends are not excluded from the scope of this investigation when blended with HFCs from non-subject countries.

125. R-143a or 1,1,1-Trifluoroethane has the chemical formula CF3CH3 and is registered as CAS No. 420-46-2. R-143a may also be known as R-143a, HFC-143a, Methylfluoroform, 1,1,1-Trifluoroform, and UN2035.

Excluded from this investigation are blends of refrigerant chemicals that include products other than HFCs, such as blends including chlorofluorocarbons (CFCs) or hydrochlorofluorocarbons (HCFCs).

Also excluded from this investigation are patented HFC blends, such as ISCEON® blends, including MO99™ (RR-438A), MO79 (R-422A), MO59 (R-417A), MO49Plus™ (R-437A) and MO29™ (R-4 22D), and Genetron® Performax™ LT (R-407F).

Tariff treatment

Based upon the scope set forth by the Department of Commerce, information available to the Commission indicates that the products subject to this investigation are imported under HTS subheading 3824.78.00 if HFC mixtures or blends and statistical reporting number 2903.39.2030 if single HFC components (nonenumerated fluorinated hydrocarbons). Both of these HTS provisions have a general duty rate of 3.7 percent ad valorem.

THE PRODUCT

Description and applications

Hydrofluorocarbons are synthetic chemical compounds containing only hydrogen, fluorine, and carbon. They are non-chlorine containing compounds that have no ozone depleting potential because they do not contain chlorine.[12] They do not occur naturally. Individual component HFCs and the blends containing them are colorless, odorless gases that are generally used for refrigeration and air conditioning application, although certain HFC

[12] HFCs were a family of products that were developed in the 1990s when previous generations of refrigerants, such as chlorofluorocarbons ("CFC") and hydochlorofluorocarbons ("HCFC"), were phased out by the Environmental Protection Agency ("EPA") due to their ozone depleting properties. Both CFC and HCFC are chlorine containing compounds which deplete the ozone layer. The key HCFC was R-22, commonly referred to as "Freon," a "workhorse grade" of refrigerant that had a very wide range of thermodynamic properties which allowed it to be used in many applications. As R-22 was being phased out, the industry worked to develop a new group of refrigerant blends that would be able to replace R-22 in the market. As a result, U.S. producers began to build HFC component facilities to create the "building blocks" for HFC blends to replace R-22 in the market. These HFC blends do not contain chlorine, do not deplete the ozone, are not toxic, and are not flammable. Conference transcript, p. 27-28 (Sassano).

components can also be used for flame suppression, aerosol propellants, foam blowing, and as precursors for polymers.

The HFC blends subject to this investigation are used almost exclusively for refrigeration and air conditioning.[13] These two major end uses are further categorized into residential air conditioning and heat pumps, commercial air conditioning, commercial refrigeration (e.g., walk-in coolers and supermarket display cases), transportation refrigeration, and process refrigeration (e.g., food processing and chemical manufacturing).[14] As they were developed to replace R-22, a single refrigerant, in these low- and medium-temperature conditions, the subject blends have considerable overlap in their applications.[15]

The individual HFCs subject to this investigation are used primarily as inputs for the subject HFC blends but also have limited applications as fire suppressants (R-125) and propellants (R-143a).[16] R-32 was approved in February 2015 for self-contained air conditioning systems. Given how recently this change occurred, there are no data available yet on its impact on the market.[17]

Manufacturing processes

Single-component HFCs (also called "halocarbon gases"), such as R-32, R-125 and R-143a, are manufactured by reacting hydrofluoric acid with a chlorine starting compound, such as methylene chloride, tetrachloroethylene or trichloroethane. This reaction, known as hydrofluorination, yields a carbon-hydrogen-fluorine compound and hydrochloric acid. Thus, R-32 (difluoromethane) is manufactured by hydrofluorination of methylene chloride according to the following formula: [18]

$$\underset{\text{(Methylene Chloride)}}{CH_2Cl_2} + 2HF \longrightarrow \underset{\text{(R-32)}}{CH_2F_2} + 2HCl$$

R-125 (1,1,1,2,2-pentafluoroethane) is manufactured by either vapor-phase or liquid-phase catalytic fluorination in a continuous process. The catalysts for vapor phase fluorination are usually chromium oxide or aluminum compounds; antimony pentachloride is used in liquid phase fluorination. One starting chlorine compound for vapor phase hydrofluorination is tetrachloroethylene, also known as perchloroethylene or "PCE," which is used in the presence of a chromium-oxide catalyst. Another starting compound for hydrofluorination is trichloroethylene, or TCE.[19]

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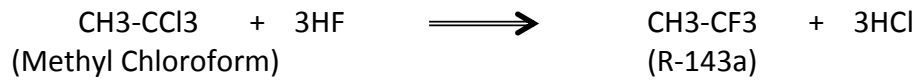
[13] Petition, p. 17.
[14] Petition, pp. 18-19.
[15] Petition, p. 19.
[16] Petition, pp. 20, 34.
[17] Petition, pp. 157-158.
[18] Petition, p. 15.
[19] Petition, p. 15.

R-143a (1,1,1-trifluoroethane) is produced through the hydrofluorination of 1,1,1-trichloroethane (methyl chloroform). R-143a (1,1,1-trifluoroethane) is produced through the hydrofluorination of 1,1,1-trichloroethane (methyl chloroform). In this iterative process, the chlorine atoms are replaced with fluorine atoms.[20] HCFC-141b and HCFC-142b, intermediate steps in this production process, are ozone-depleting substances that are no longer made in developed countries.[21]



The production process of R-134a, a nonsubject component, is documented in the USITC publication for those investigations.[22]

The blending process used to transform component HFCs into blends is not as capital intensive as the process to produce component HFCs. Unlike the manufacture of the individual component HFCs, blending HFCs does not require a chemical reaction, involve substantial energy or labor inputs, or generate by-products.[23]

Commercial manufacturing of HFC blends involves large-scale mixing of component HFCs in precise quantities under controlled pressure for a specific period of time. To blend R-410A, for example, R-32 and R-125 are piped from separate tanks into a blending tank. The HFC with the lowest vapor pressure (e.g., R-32) is typically introduced into the blending tank first. Other component HFCs are then added, progressing from the lowest to the highest vapor pressure. In the case of R-410A, the blending tank produces a uniform blend of the R-32 and R-125 in prescribed proportions, i.e., 50/50. The blend is continuously recirculated in the blending tank for a period of time. A liquid sample is drawn and analyzed in a laboratory. If the analysis is within the specification, the blend is ready for packaging. If not, additional HFC components are added as necessary.[24]

DOMESTIC LIKE PRODUCT ISSUES

The petitioners contend that the domestic like product should be defined as all HFC blends and single HFC components thereof within the scope.[25] Respondent National argues that the Commission should find HFC components and HFC blends as separate like products using the Commission's semifinished product analysis[26] and if the results of that analysis are

[20] Petition, p. 16.
[21] Chemical Economics Handbook, *Fluorocarbons*, February 2014, pp. 34-5.
[22] *1,1,1,2-Tetrafluoroethane from China*, Inv. Nos. 701-TA-509 and 731-TA-1244 (Final), USITC Publication 4503, December 2014, pp. I-7 to I-9.
[23] Petition, p. 34.
[24] Petition, p. 16.
[25] Petition, p. 29 and Petitioners' postconference brief, p. 4.
[26] Respondent National's postconference brief, p. 6.

inconclusive, then the Commission should use its six factor like product analysis.[27] Chinese respondents and respondent Daikin America agree with respondent National's argument that HFC components and HFC blends are separate like products.[28]

WITHIN SCOPE PRODUCT DISCUSSION

The Commission's decision regarding the appropriate domestic product(s) that are "like" the subject imported product is based on a number of factors including: (1) physical characteristics and uses; (2) common manufacturing facilities and production employees; (3) interchangeability; (4) customer and producer perceptions; (5) channels of distribution; and (6) price. Information regarding these factors is discussed below.

Physical characteristics and uses

As discussed in the R-134a investigations, refrigerants need to be nontoxic, noncorrosive, nonflammable, and preferably have a low vapor pressure. The uses of a refrigerant are also somewhat limited and determined by the form (liquid versus gas) of the compound at the prevailing conditions.

Hydrofluorocarbons are a class of man-made chemical components that contain fluorine, carbon and hydrogen atoms. These compounds have the chemical formula $C_nH_xF_{(2n+2-x)}$ where $1<n<6$. HFC blends are mixtures of two or more single HFC components. The HFC blends and components are colorless, odorless gases that are hydrophobic. The five HFC blends covered by this petition are the major commercial refrigerant blends sold in the U.S. market for use in stationary air conditioning and refrigeration applications. These products consist of various blends of the three single component HFC refrigerants identified above and, in three cases, nonsubject HFC component, R-134a.

The composition of each subject HFC blend, by weight of HFC components, is shown in table I-1. The nominal composition and the allowable composition may vary by plus-or-minus two percent.

[27] Respondent National's postconference brief, p. 20.

[28] Chinese respondents postconference brief, p. 9 and respondent Daikin America's postconference brief, p. 2.

Table I-1
HFC: Composition of subject HFC blends, by HFC component, by nominal weight

Item	R-404A	R-407A	R-407C	R-410A	R-507A
HFC components:					
R-32		20%	23%	50%	
R-125	44%	40%	25%	50%	50%
R-134a[1]	4%	40%	52%		
R-143a	52%				50%

[1] This is a nonsubject HFC component that is used to make three of five subject HFC blends.

Source: AHRI Standard 700-2012, Table 2A, Petition, p. 13 and exh. I-4.

HFC blends were developed to succeed hydrochlorofluorocarbons ("HCFCs"), as the refrigerant in residential and commercial air conditioning and refrigeration applications. HCFCs cause ozone depletion and have been phased out of original equipment applications pursuant to the Montreal Protocol.[29] HFCs were developed as a replacement that would not deplete the ozone layer. The near-azeotropic[30] HFC blends, including R-404A, R-407A, R-407C, and R- 410A, were principally developed to replace R-22. The azeotropic[31] HFC blend, R-507A, was likewise developed as a replacement for HCFCs, such as R-22.

HFC blends share key properties that enable their use in air conditioning and refrigeration applications as replacements for HCFCs. HFC blends are nonflammable, nontoxic, noncorrosive, and recyclable.[32] These properties allow for efficient, safe commercial use in air conditioning and refrigeration systems. The HFC blends are excellent low- and medium temperature refrigerants. The blends do not cause ozone depletion, although they do have a potentially high global warming potential ("GWP") if the refrigerants leak into the atmosphere.[33]

HFC blends are suitable for use in low- to medium-temperature refrigeration, including residential and certain commercial air conditioning applications, and commercial, transport and some process refrigeration applications. All of the HFC blends are replacements for HCFCs, particularly R- 22. In the large majority of new residential and commercial air conditioning

[29] R-22 continues to be used in the replacement market, but that use will also be phased out by 2020, after which only recycled R-22 will be available to the replacement market. Petition, p. 13.

[30] Near Azeotrope - A mixture made up of two or more refrigerants with different boiling points that, when in a totally liquid or vapor state, act as one component. However, when changing from vapor to liquid or liquid to vapor, the individual refrigerants -evaporate or condense at different temperatures. Near-azeotropic mixtures have a temperature glide (see below) of less than 10° F and should be charged in the liquid state to assure proper mixture (non-azeotropic) composition. Accessed from http://www.refrigerants.com/terminology.htm on July 29, 2015).

[31] An "azeotropic" blend is a "liquid mixture of two or more substances which behaves like a single substance in that the vapor produced by partial evaporation of liquid has the same composition as the liquid." R.J. Lewis, *Hawley's Condensed Chemical Dictionary*, at 103 (14th ed., 2001). Petition, p. 14.

[32] Petition, p. 14.

[33] Petition, p. 14.

systems, R-410A has replaced R-22. In commercial refrigeration applications, existing equipment is typically retro-fitted to use R-404A, R-407C or other HFC blends in lieu of R-22.[34]

Manufacturing facilities and production employees

Each HFC single component requires a separate production facility[35] while various HFC blends can be manufactured using the same facility and employees. According to both petitioners and respondents, the capital investment required and the expertise of the personnel to blend the HFC components can be relatively minimal compared to the capital investment and expertise necessary for an HFC single component facility.[36] While the investment required to produce the individual components can be hundreds of millions of dollars,[37] a blending facility can be constructed for $1 million to $3 million.[38] Table I-2 presents responses by U.S. producers on the capital investment necessary to operate HFC component and HFC blending facilities.

Table I-2
HFC: U.S. producers' comparison of capital investments HFC component facilities vs HFC blend facilities

* * * * * * *

Interchangeability

Within scope: Individual HFC blends

Table I-3 presents U.S producers' and U.S. importers' responses to the interchangeability of individual HFC blends. Detailed narratives provided by U.S producers and U.S. importers on the interchangeability of individually covered HFC blends are provided in Appendix F, table F-6.

[34] Petition, pp. 14-15.

[35] One U.S. producer, ***, reported being able to switch production from subject HFC components to a nonsubject HFC component, ***.

[36] Respondent National stated that the expertise required to test, maintain, and dispense these products was somewhat more involved but then acknowledged that repackaging distributors would also have to perform these same functions even without blending. Conference transcript, pp. 181-182 (Beatty).

[37] Conference transcript, p. 30 (Sassano).

[38] Conference transcript, p. 49 (Clark) and p.151 (Ponder).

Table I-3
HFC: U.S. producers' and U.S. importers' responses to questions relating to interchangeability of individual HFC blends

Country pair	U.S. Producers				U.S. importers			
	A	F	S	N	A	F	S	N
R-404A vs. R-407A	0	2	1	1	1	2	3	3
R-407A vs. R-407C	0	1	3	0	0	1	5	3
R-407A vs. R-410A	0	1	1	2	1	1	1	6
R-407C vs. R-507A	0	1	2	1	0	1	3	5
R-407A vs. R-407C	0	1	3	0	0	1	5	3
R-407A vs. R-410A	0	1	1	2	1	1	1	6
R-407A vs. R-507A	0	2	1	1	1	2	3	3
R-407C vs. R-410A	0	1	1	2	1	1	2	5
R-407C vs. R-507A	0	1	2	1	0	1	3	5
R-410A vs. R-507A	0	1	2	1	1	1	2	5

Note.--See appendix F, table F-6 for detailed responses by company.

Source: Compiled from data submitted in response to Commission questionnaires.

Customer and producer perceptions

The three covered HFC components have "essentially no direct market" because these HFC components were "created and exist today for the HFC blends market."[39] The HFC blends, not the HFC components,[40] are perceived to be the replacement for previous generation refrigerants such as CFCs and HFCFs as a cooling agent in the U.S. refrigeration and air conditioning market.

Channels of distribution

As indicated in table I-4, *** to *** percent of the three subject HFC components are either internally consumed or sold to blenders to produce HFC blends. The subject HFC blends are mostly sold to distributors and service centers (***) and original equipment manufacturers ("OEM") (***) percent.

[39] Conference transcript, p. 28 (Sassano).

[40] One HFC component, R-32, has been approved for use directly in the market even though it contains flammable properties. R-32 is "part of an effort in the past 3-4 years to get the A2L ASHRAE classification adopted into the three model building codes." This code is revised every three years and the "prevailing opinion in the industry is that the 2018 revision cycle might include approval for R-32 as a stand-alone refrigerant." Respondent National's postconference brief, exh. 1, pg. 8. The EPA approved the use of R-32 in "some self-contained air conditioning units" in February 2015. Conference transcript, pp. 157-8 (Beatty).

Table I-4
HFC: U.S. producers' U.S. shipments of individual blends and components by channel, January 2012 through March 2015

* * * * * * *

Price

As indicated in table I-5, subject HFC blends are typically priced higher than subject HFC components, with the exception of R-125. An industry witness at the staff conference alleged that there was a "hangover effect" from an R-125 shortage in 2010-11 that may have affected the price for R-125 during the period of investigation.[41]

Table I-5
HFC: Average unit values of U.S. producers' U.S. shipments of individual blends and components, January 2012 through March 2015

* * * * * * *

Figure I-1
HFC: Average unit values of U.S. producers' U.S. shipments of individual blends and components, January 2012 through March 2015

* * * * * * *

Intermediate products: HFC components vs HFC blends

The Commission's analysis regarding semifinished and finished products is based on the following five factors: (1) whether the upstream article is dedicated to the production of the downstream article or has independent uses; (2) whether there are perceived to be separate markets for the upstream and downstream articles; (3) differences in the physical characteristics and functions of the upstream and downstream articles; (4) differences in the costs or value of the vertically differentiated articles; and (5) significance and extent of the processes used to transform the upstream into the downstream articles. HFC components are intermediate products used in the production of HFC blends. Table I-6 presents data from U.S. producers' and U.S. importers' responses to semifinished products questions by individual blend and additional information regarding these five factors is discussed below. Detailed narratives provided by U.S producers and U.S. importers on these five factors are provided in appendix F, tables F-1 to F-5.

[41] Conference transcript, p. 130 (Beatty) and National's postconference brief, exh. 1, p. 6 and exh. 11.

Table I-6

HFC: U.S. producers' and U.S. importers' responses to questions relating to Commission's semi-finished product analysis (components vs blends)

HFC component	Uses other than in HFC blend production					
	U.S. producers			U.S. importers		
	No	Yes	Total responding	No	Yes	Total responding
R-32	1	4	5	3	6	8
R-125	1	4	5	3	5	8
R-134a[1]	0	5	5	1	9	10
R-143a	4	1	5	6	2	8
HFC component	**Differences in markets for HFC blends**					
	U.S. producers			U.S. importers		
	No	Yes	Total responding	No	Yes	Total responding
R-32	3	2	5	3	4	7
R-125	2	3	5	2	5	7
R-134a[1]	0	5	5	2	7	9
R-143a	5	0	5	4	1	5
HFC component	**Differences in physical characteristics from HFC blends**					
	U.S. producers			U.S. importers		
	No	Yes	Total responding	No	Yes	Total responding
R-32	0	5	5	1	7	8
R-125	1	4	5	2	6	8
R-134a[1]	2	3	5	2	6	8
R-143a	1	4	5	3	5	8
HFC component	**Differences in price vs HFC blends**					
	U.S. producers			U.S. importers		
	No	Yes	Total responding	No	Yes	Total responding
R-32	2	3	5	5	4	9
R-125	2	3	5	5	3	8
R-134a[1]	3	2	4	6	3	8
R-143a	2	1	3	5	1	6
HFC component	**Extensive process to convert to HFC blend**					
	U.S. producers			U.S. importers		
	No	Yes	Total responding	No	Yes	Total responding
R-32	4	1	5	9	1	10
R-125	4	1	5	9	1	10
R-134a[1]	4	1	5	9	1	10
R-143a	4	1	5	9	1	10

[1] R-134a is not a subject HFC component, but it is used as an ingredient in blending the subject HFC blends.

Note.--See appendix F, tables F-1 through F-5 for detailed responses by company.

(1) Uses: The three subject HFC components that make up the semi-finished HFC product are used primarily as ingredients for the five subject HFC blends and not typically sold separately in the U.S. market.[42] The five subject HFC blends are used in 99 percent of commercial refrigerant blends sold in the U.S. market for use in stationary air conditioning and refrigeration applications.[43]

(2) Markets: The three subject HFC components are not usually sold for use as a single component. [44] They are swapped and sold to HFC blenders for production of the downstream HFC blends.

(3) Characteristics and functions: There are physical differences between the semifinished HFC components and the downstream HFC blends. The handling of the finished HFC blends is different from that required for the semifinished HFC components. If the proper conditions are not maintained for the blends, then the various components may separate, changing the composition of the blend. The same is true when some of the blend is withdrawn from a larger container for use in an application. The person extracting the blend must test the product to make sure that it still meets the specifications for that blend. These actions are not necessary for an individual component because, as a single compound, it cannot separate.[45] Additionally, the blends are not flammable, making them suitable for us as refrigerants. Two of the subject components, on the other hand, are flammable and require the appropriate safety precautions.[46]

(4) Value: HFC components are purchased in the spot market and/or swapped by individual HFC component producers for use in the downstream production of HFC blends. The downstream products (HFC blends) typically possess a higher unit value than the upstream/semifinished product (HFC components), with the exception of HFC component R-125. Table I-7 presents the average unit values ("AUV") for HFC blends of both producers of HFC components and independent blenders. For the ratios showing the cost of goods sold, please see the *Value Added* section of *Part VI*.

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[42] The fourth HFC component, R-134a, necessary to make three out of five subject HFC blends, is not subject to this investigation. This nonsubject component is sold directly to end users, mainly for use in car air conditioning systems.

[43] Other HFC blends, including patented and proprietary, that are not subject to this investigation account for approximately "one percent" of the HFC market in the United States. Conference transcript, p. 49 (Sassano).

[44] One HFC component, R-32, has been approved by the EPA in February 2015 for use in "some self-contained air conditioning units". Conference transcript, pp. 157-158 (Beatty).

[45] Conference Transcript, p. 95 (Clark, Irani).

[46] Conference transcript, p. 137 (Goldfeder).

Table I-7
HFC: Commercial U.S. shipments for HFC blending, by HFC integrated producers and independent blenders, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

(5) Transformation processes: As noted earlier in the *Domestic Like Product* section, HFC blends require additional processing in a facility using equipment different from single HFC component production.

OUT-OF-SCOPE PRODUCT DISCUSSION

Within scope HFC blends to out-of-scope HCFC/CFC blends

HCFC/CFC blends are a related product family to HFC blends but are outside of the scope of this investigation.[47] Table I-8 presents U.S producers' and U.S. importers' responses to the traditional six factors of the Commission's like product analysis comparing the HFC blends to out-of-scope HCFC/CFC blends. Detailed narratives provided by U.S producers and U.S. importers of the six factors are provided in appendix F, table F-7.

Table I-8
HFC: U.S. producers' and U.S. importers' responses to questions comparing HFC blends to out-of-scope HCFC/CFC blends, by factor

	U.S. Producers				U.S. importers			
Country pair	Fully	Mostly	Somewhat	Not at all	Fully	Mostly	Somewhat	Not at all
Characteristics and Uses--HFC vs HCFC/CFC	0	0	5	0	0	3	8	1
Interchangeability--HFC vs HCFC/CFC	0	0	4	1	0	1	8	3
Manufacturing--HFC vs HCFC/CFC	0	1	2	1	1	1	4	1
Channels--HFC vs HCFC/CFC	0	3	2	0	6	5	2	0
Market perceptions--HFC vs HCFC/CFC	0	1	2	2	2	4	4	3
Price--HFC vs HCFC/CFC	0	0	0	5	0	0	1	11

Note.--See appendix F, table F-6 for detailed responses by company.

Source: Compiled from data submitted in response to Commission questionnaires.

Within scope HFC blends to out-of-scope HFO blends

HFO is "hydrofluoroolefin" technology related to HFC blends outside of the scope of this investigation. HFO blends are commonly referred to as "next generation" refrigerant blends that are being developed by the HFC industry to "meet EPA's mandate to lower GWP

[47] Conference transcript, p. 106 (Sassano). Ms. Sassano further explained that CFCs and HCFCs are "pre-generation" chlorine containing compounds and are ozone depleters. The subject HFC blends are not ozone depleters, but continue to contribute to global warming.

refrigerants." HFO blends do not have ozone depleting properties and have very low to no GWP. [48] These patented HFO blends are new "green" and sustainable chemical compounds being developed by companies to eventually replace subject HFC blends in some applications.[49] Table I-9 presents U.S producers' and U.S. importers' responses to the traditional six factors of the Commission's like product analysis as it relates to out-of-scope HFO blends. Detailed narratives provided by U.S producers and U.S. importers of the five factors are provided in appendix F, table F-8.

Table I-9
HFC: U.S. producers' and U.S. importers' responses to questions comparing HFC blends to out-of-scope HFO blends, by factor

	U.S. Producers				U.S. importers			
Country pair	Fully	Mostly	Somewhat	Not at all	Fully	Mostly	Somewhat	Not at all
Characteristics and Uses--HFC vs HFO	0	1	4	0	0	3	5	1
Interchangeability--HFC vs HFO	0	0	4	0	0	2	6	1
Manufacturing--HFC vs HFO	0	1	2	1	0	2	3	1
Channels--HFC vs HFO	0	2	3	0	0	3	5	1
Market perceptions--HFC vs HFO	0	1	2	1	0	1	4	2
Price--HFC vs HFO	0	0	0	3	0	0	1	7

Note.--See appendix F, table F-6 for detailed responses by company.

Source: Compiled from data submitted in response to Commission questionnaires.

Out-of-scope HFC blends

More than 50 refrigerant blends use the subject components (plus nonsubject R-134a). Table I-10 presents information on the composition of these blends, only a handful of which are covered in the scope of this investigation. A number of the blends not covered by the scope of this investigation were positively identified as "excluded HFC blends" in the scope language, either by their blend designation or by a company-specific trademark. The blends expressly excluded from the scope are identified by an asterisk. This table does not list all refrigerant blends—only those that contain at least one of the subject components (plus nonsubject R-134a).

[48] Conference transcript, p. 158 (Beatty).
[49] Conference transcript, p. 106 (Irani) and p. 106 (Sassano).

Table I-10
HFC: Component inputs by weight

	Component input by weight					Note
HFC blends	**R-32**	**R-125**	**R-134a[1]**	**R-143a**	**Other**	
Subject HFC blends:						
R-404A		44%	4%	52%		
R-407A	20%	40%	40%			
R-407C	23%	25%	52%			
R-410A	50%	50%				
R-507A		50%		50%		
Out-of-scope HFC blends that contain exclusively covered components and R-134a:						
R-407B	10%	70%	20%			
R-407D	15%	15%	70%			
R-407E	25%	15%	60%			
R-407F*	30%	30%	40%			***
R-410B	45%	55%				
R-421A		58%	42%			Produced by Choice Refrigerants; under patent; New ERA group, includes a proprietary additional "unidentified lubricant"
R-421B		85%	15%			Produced by Choice Refrigerants; under patent
R-427A	15%	25%	50%	10%		***
Out-of-scope HFC blends that contain some covered components and/or R-134a, but also other chemicals:						
R-413A			88.0%		12.0%	R-218: 9.0%; R-600A: 3.0%
R-417A*		46.6%	50.0%		3.4%	R-600: 3.4%; ***
R-417B		79.0%	18.3%		2.7%	R-600: 2.7%
R-417C		19.5%	78.8%		1.7%	R-600: 1.7%
R-419A		77.0%	19.0%		4.0%	R-E170: 4.0%
R-419B		48.5%	48.0%		3.5%	R-E170: 3.5%
R-422A*		85.1%	11.5%		3.4%	R-600A: 3.4%; ***
R-422B		55.0%	42.0%		3.0%	R-600A: 3.0%
R-422C		82.0%	15.0%		3.0%	R-600A: 3.0%
R-422D*		65.1%	31.5%		3.4%	R-600A: 3.4%; ***
R-422E		58.0%	39.3%		2.7%	R-600A: 2.7%
R-423A			52.5%		47.5%	R-227EA: 47.5%
R-424A		50.5%	47.0%		2.5%	R-600A: 0.9%; R-600: 1.0%; R-601A: 0.6%
R-425A	18.5%		69.5%		12.0%	R-227EA: 12.0%
R-426A		5.1%	93.0%		1.9%	R-600: 1.3%; R-601A: 0.6%
R-428A		77.5%	20.0%		2.5%	R-290: 0.6%; R-600A: 1.9%
R-434A		63.2%	16.0%	18.0%	2.8%	R-600A: 2.8%
R-437A*		19.5%	78.5%		2.0%	R-600: 1.4%; R-601: 0.6%; ***
R-438A*	8.5%	45.0%	44.2%		2.3%	R-600: 1.7%; R-601A: 0.6%; ***
R-439A	50.0%	47.0%			3.0%	R-600A: 3.0%
R-440A			1.6%		98.4%	R-290: 0.6%; R-152A: 97.8%
R-442A	31.0%	31.0%	30.0%		8.0%	R-152A: 3.0%; R-227EA: 5.0%
R-512A			5.0%		95.0%	R-152A: 95.0%

Table continued on next page.

Table I-7--*Continued*
HFC: Component inputs by weight

HFC blends	Component input by weight					Note
	R-32	R-125	R-134a[1]	R-143a	Other	
Out-of-scope HCFCs/CFCs:						
R-408A		7.0%		46.0%	47.0%	R-22: 47.0%
R-416A			59.0%		41.0%	R-124: 39.5%; R-600: 1.5%
R-420A			88.0%		12.0%	R-142B: 12.0%
R-453A	20.0%	20.0%	53.8%		6.2%	R-227EA: 5.0%; R-600A: 0.6%; R-601A 0.6%
R-504	48.2%				51.8%	R-115: 51.8%
Out-of-scope HFOs:						
R-444A	12.0%				88.0%	R-152A: 5.0%; R-1234ZE: 83.0%
R-445A			9.0%		91.0%	R-744: 6.0%; R-1234ZE: 85.0%
R-448A	26.0%	26.0%	21.0%		27.0%	R-1234YF: 7.0%; R-1234ZE: 20.0%
R-449A	24.3%	24.7%	25.7%		25.3%	R-1234ZE: 25.3%
R-449B	25.2%	24.3%	27.3%		23.2%	R-1234ZE: 23.2%
R-450A			42.0%		58.0%	R-1234YF: 58.0%
R-451A			10.2%		89.8%	R-1234ZE: 89.8%
R-451B			11.2%		88.8%	R-1234ZE: 88.8%
R-452A	11.0%	59.0%			30.0%	R-1234ZE: 30.0%
R-454A	35.0%				65.0%	R-1234ZE: 65.0%
R-454B	68.9%				31.1%	R-1234ZE: 31.1%
R-513A			44.0%		56.0%	R-1234ZE: 65.0%

[1] R-134a is not a subject HFC component, but it is used as an ingredient in blending three out of five of the subject HFC blends.

Note.--Positively identified exclusions are based on the scope of Commerce's initiation in this investigation.

Source: ASHRAE Standard 34-2013, https://www.ashrae.org/standards-research--technology/standards--guidelines/standards-activities/ashrae-refrigerant-designations (accessed July 23, 2015), National's response to staff e-mail, both dated July 23, 2015.

PART II: CONDITIONS OF COMPETITION IN THE U.S. MARKET

U.S. MARKET CHARACTERISTICS

HFCs were developed to replace chlorofluorocarbons (CFCs) and hydro chlorofluorocarbons (HCFCs) in low- and medium- temperature refrigeration and air-conditioning applications. HFC blends are used in residential air conditioning and heat pumps and in commercial air-conditioning, particularly decentralized systems with less than 100 tons in capacity. Additionally, HFC blends are used in commercial refrigeration, such as supermarket display and walk-in coolers; transportation refrigeration; and process refrigeration.[1]

Most covered HFC components are used in the production of HFC blends, which are composed of differing ratios of HFC components.[2] Petitioners indicated that the "most important" end use for covered HFC components is for HFC blends, with small amounts of components sold for other end uses; specifically, R-125 can be used in fire suppression systems. Blender and importer National reported additional end uses for HFC components, such as R-125 which can be used in smelting applications, in foam blowing and in certain medical applications for equipment using non-flammable inert pressurized gas. Additionally, National reported that both R-125 and R-32 can be used in semiconductor silicon wafer manufacturing for etching silicon.[3] Petitioners reported that R-32 is used in China and Japan as an independent refrigerant in residential air conditioning systems, but has not been fully approved for use in the United States.[4] National indicated that R-32 will be fully developed for use in the United States in a "few years," instead of the 8-10 years that was suggested by Petitioners.[5]

The Commission received questionnaire responses from five domestic producers of HFC components and/or blends. Three of these firms (Arkema, Chemours, and Honeywell) produce both components and blends, while two of these firms (Hudson and National) produce only blends. All three domestic HFC component producers internally consume HFC components, engage in swapping arrangements with other HFC component producers, and import HFC components to produce HFC blends. They also sell HFC components to HFC blenders.

Apparent U.S. consumption of HFC blends and components increased from 2012 to 2014. Overall, apparent U.S. consumption in 2014 was *** percent higher than in 2012.

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[1] Petition, pp. 1-2 and 18-19.

[2] Petition, p. 20.

[3] Respondent National's postconference brief, p. 8.

[4] Petition, p. 20 and conference transcript, pp. 51- 52 (Clark).

[5] One HFC component, R-32, has been approved for use directly in the market even though it contains flammable properties. R-32 is "part of an effort in the past 3-4 years to get the A2L ASHRAE classification adopted into the three model building codes." This code is revised every three years and the "prevailing opinion in the industry is that the 2018 revision cycle might include approval for R-32 as a stand-alone refrigerant." Respondent National's postconference brief, exh. 1, pg. 8. The EPA approved the use of R-32 in "some self-contained air conditioning units" in February 2015. Conference transcript, pp. 157-8 (Beatty) and conference transcript, pp. 51- 52 (Clark).

CHANNELS OF DISTRIBUTION

U.S. producers sold HFC components *** to blenders/repackagers and *** sales of HFC blends *** and ***, as shown in table II-1. HFC blend and component imports from China were *** sold to distributors and service companies.[6] Petitioners reported that Chinese importers sell HFC blends to the replacement market for service contractors working with residential air conditioning and commercial refrigeration systems.[7]

Table II-1
HFC: U.S. producers' and U.S. importers' channels of distribution, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

GEOGRAPHIC DISTRIBUTION

U.S. producers and importers reported selling HFC blends and components to all regions in the United States (table II-2). For U.S. producers, *** percent of sales were within 100 miles of their production facilities, *** percent were between 101 and 1,000 miles, and *** percent were over 1,000 miles. Importers sold *** percent within 100 miles of their U.S. points of shipment, *** percent between 101 and 1,000 miles, and *** percent over 1,000 miles.

Table II-2
HFC: Geographic market areas in the United States served by U.S. producers and importers

Region	U.S. producers	U.S. imports from China
Northeast	5	10
Midwest	5	7
Southeast	5	10
Central Southwest	5	9
Mountains	5	8
Pacific Coast	5	7
Other[1]	4	1
All regions (except Other)	5	7
Reporting firms	5	12

[1] All other U.S. markets, including AK, HI, PR, and VI. U.S. producers *** and importer *** reported selling to these other regions.

Source: Compiled from data submitted in response to Commission questionnaires.

[6] Direct imports of components account for the 90.6 percent of the Chinese imported components from January 2012 to March 2015 and are not included in commercial shipments totals.

[7] Petition p. 44, and conference transcript, p. 40 (Sassano).

SUPPLY AND DEMAND CONSIDERATIONS

U.S. supply

Domestic production

Based on available information, U.S. HFC producers have the ability to respond to changes in demand with moderate changes in the quantity of shipments to the U.S. market. The main contributing factors to this degree of responsiveness of supply are available capacity, the high level of exports, and increasing inventories.

Industry capacity

Domestic capacity utilization for HFC components decreased slightly from 76.2 percent in 2012 to 74.0 percent in 2014, and was *** percent in the first quarter of 2015. Both HFC component production capacity and production decreased over the period of investigation.[8] This moderate level of capacity utilization suggests that U.S. producers may be able to increase production of HFC components in response to an increase in prices.

Domestic capacity utilization for HFC blends increased from 51.1 percent in 2012 to 59.9 percent in 2014, and was *** percent in the first quarter of 2015.[9] Both HFC blend production capacity and production increased over the period of investigation.[10] This relatively low level of capacity utilization suggests that U.S. producers may have ability to increase production of HFC blends in response to an increase in prices.

Alternative markets

Exports accounted approximately *** percent of U.S. producers' total shipments of both components and blends. The high level of export shipments indicates that U.S. producers may have some ability to shift shipments between the U.S. market and other markets in response to price changes.

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[8] In 2014, component R-32 made up [12.6] percent of HFC component production; component R-125 made up [34.8] percent of HFC component production and component R-143a made up [6.2] percent of HFC component production. Nonsubject component R-134a made up [46.4] percent of component production in 2014.

[9] In 2014, blend R-410A made up [70.4] percent of total U.S. blend production blend production; R-404A made up [18.0] percent of total U.S. blend production; blend R-407A made up [3.2] percent; blend R-407C made up [4.4] percent; and blend R-507a made up [4.0] percent.

[10] The U.S. producers were asked to provide their sales of HFC blends and the shares of each product that consisted of domestic components versus imported components. The majority of [Arkema, Chemours, and Honeywell's] HFC blends use domestically produced components. The majority of [National's] HFC blends use Chinese produced components.

U.S. producers' exports of components, as a percentage of total shipments, decreased from *** percent in 2012 to *** percent in 2014, and were *** percent in first quarter 2015. U.S. producers' exports of components declined by approximately *** million short tons from 2012 to 2014. U.S. producers' exports of blends, as a percentage of total shipments, increased slightly from *** percent in 2012 to *** percent in 2014, and were *** percent in the first quarter of 2015. U.S. producers' export shipments of blends rose by approximately *** million short tons from 2012 to 2014.

Europe is the principal export market for U.S. producers *** for components and blends. Canada is also an export market for U.S. producers *** for blends. U.S. producers reported that regulation shifts from HCFC R-22 to HFC blends and components has helped to increase demand for HFC blends and components abroad.

Inventory levels

U.S. producers' HFC inventories of components and blends increased over the period of investigation. U.S. producers' component inventories, as a ratio to total shipments, increased from *** percent in 2012 to *** percent in 2014. U.S. producers' blend inventories, as ratio to total shipments, increased from *** percent in 2012 to *** percent in 2014. These inventory levels suggest that U.S. producers may have some ability to respond to changes in demand with changes in the quantity shipped from inventories.

Production alternatives

*** U.S. component producers stated that they could not switch production among covered HFC components.[11] U.S. component producer *** reported that that the ***. *** U.S. producers reported being able to switch production among in-scope blends, and reported that the time to change over equipment was the pricamary supply constraint. *** reported being able to produce *** on the same blending equipment as in-scope blends. *** reported that ***. *** reported being able to produce *** on the same blending equipment as in-scope blends, and reported that supply switching is constrained by ***.

Supply constraints

*** reported supply constraints issues involving HFC component *** and blend ***. In June 2013, *** extended delivery lead times by *** to account for increased demand for HFC blends. In the third quarter of 2014, *** extended delivery lead times by *** to address a temporary delay in the supply of steel cylinders. National reported that directly before the

[11] U.S. producer *** reported being able to produce out-of-scope *** on the same equipment used to make in-scope HFC components.

period of investigation (2010-11), there was a shortage of HFC component R-125 in the United States that did not improve until 2012.[12]

Subject imports from China[13]

Based on available information, HFC producers in China have the ability to respond to changes in demand with moderate-to-large changes in the quantity of shipments to the U.S. market. The main contributing factors to this degree of responsiveness of supply are the *** and is hindered by ***.

Industry capacity

Chinese capacity utilization for HFC components increased from *** percent in 2012 to *** percent in 2014, and was *** percent in first quarter 2014 and *** percent in first quarter 2015. From 2012 to 2014, Chinese production of HFC components increased by *** percent, and Chinese capacity of HFC components increased by *** percent. This relatively high level of capacity utilization suggests that Chinese producers may have limited ability to increase production of HFC components in response to an increase in prices.

Chinese capacity utilization of HFC blends increased from *** percent in 2012 to *** percent in 2014. In the first quarter of 2014, Chinese capacity utilization was *** percent, and in the first quarter of 2015, capacity utilization was *** percent. From 2012 to 2014, Chinese production of HFC blends increased by *** percent, and Chinese capacity of HFC components increased by *** percent. This relatively low level of capacity utilization suggests that Chinese producers may have some ability to increase production of HFC blends in response to an increase in prices.

Alternative markets

Chinese producers' exports of components, as a percentage of total shipments, increased from *** percent in 2012 to *** percent in 2014. Chinese producers' exports of blends, as a percentage of total shipments, increased from *** percent in 2012 to *** percent in 2014. In 2014, *** percent of Chinese total component shipments were to the United States and *** percent of Chinese total blend shipments were to the United States. For components, seven Chinese producers reported that Europe was their principal export market and three indicated that Korea was their principal market. For blends, five Chinese producers reported Europe, three reported Southeast Asia, and two reported Turkey as their principal export markets. Due to the moderate level of export shipments, Chinese producers may have some

[12] Conference transcript, p. 130 (Beatty), and respondent National's postconference brief, exhibit 1, p. 12.

[13] The Commission received questionnaire responses from 13 Chinese producers. These firms' exports to the United States represented *** percent of U.S. imports of HFC components from China and *** percent of U.S. imports of HFC blends from China during 2012-14.

ability to shift shipments between the U.S. market and other markets in response to price changes.

Inventory levels

Chinese producers' component inventories, as a ratio to total shipments, decreased from *** percent in 2012 to *** percent in 2014. Chinese producers' blend inventories, as a ratio to total shipments, decreased from *** percent in 2012 to *** percent in 2014. These inventory levels suggest that Chinese producers may have a limited ability to respond to changes in demand with changes in the quantity shipped from inventories.

Production alternatives

Most responding Chinese producers stated that they could not switch production among HFC components and alternative products. However, *** reported being able to produce *** on the same equipment used to make in-scope HFC components; it cited time and costs as a constraints when shifting between component production.

Two of the 11 responding Chinese blends producers, ***, reported being able to shift production to out-of-scope blends ***.[14] *** reported time and costs as constraints when shifting production among blends.[15]

Supply constraints

Two of 13 responding importers reported supply constraints with Chinese imports. Importer *** reported spot shortages of HFC blends occurred over the period of investigation but did not elaborate on the extent of the shortages or the specific blend type.

Nonsubject imports

Nonsubject import sources during the period of investigation were *** for components, and the *** for blends. For components, U.S. importers reported imports from ***[16] ***.[17] For blends, U.S. importer *** reported imports from ***.

U.S. demand

Based on available information, the overall demand for HFC is likely to experience small to-moderate changes in response to changes in price. The main contributing factors are the

[14] In addition, seven Chinese blends producers reported being able to switch production among in-scope blends.

[15]

[16] U.S. importer *** reported this nonsubject source.

[17] U.S. importers *** reported the *** nonsubject sources, respectively.

End uses

U.S. demand for HFC depends on the demand for use in downstream products. Residential air-conditioning is reportedly the largest end use, followed by commercial refrigeration (table II-3). Other end uses include commercial air-conditioning, transport refrigeration, and process refrigeration. In 2014, most shipments of HFC blends R-404A, R-407A, and R-507A were for commercial refrigeration, while HFC blends R-407C and R-410A were sold mostly for residential air-conditioning and heat pumps.

Table II-3
HFC: Reported shares of U.S. commercial shipments by end use, 2014

* * * * * * *

Petitioners and respondent *** reported that HFC component R-125 can be used in fire suppression systems. Respondent National reported that R-125 can also be used in smelting applications, in foam blowing, in certain medical applications for equipment using non-flammable inert pressurized gas, and in semiconductor silicon wafer manufacturing for etching silicon.[18] Petitioners reported that R-32 is used in China and Japan as an independent refrigerant in residential air conditioning systems, but has not been fully approved for use in the United States.[19] National indicated that R-32 will be fully developed for use in the United States in a "few years," instead of the 8-10 years that was suggested by Petitioners.[20]

Cost share

HFC blends account for a small share of the cost of the end-use products in which they are used. For OEM applications, *** reported that HFC blends account for up to *** percent of the cost of for residential and commercial air-conditioning units and up to *** percent of the cost of commercial and process refrigeration units. For service and replacement applications, *** reported that HFC blends could account for varying levels of cost depending on the nature of the service problem.[21]

Business cycles

Four of six U.S. producers and ten of 12 importers indicated that the market was subject to business cycles. All companies reported that HFC demand is seasonal with most demand occurring directly before the summer months. *** reported that certain blends involved in

[18] HFC component R-32 can be used in silicon chip manufacturing, as well. Respondent National's postconference brief, p. 8.
[19] Petition, p. 20, and conference transcript, pp. 51- 52 (Clark).
[20] Respondent National's postconference brief, p. 8 and conference transcript, pp. 51- 52 (Clark).
[21] Email from ***, July 28, 2015, Edis no. 561965.

Business cycles

Four of six U.S. producers and ten of 12 importers indicated that the market was subject to business cycles. All companies reported that HFC demand is seasonal with most demand occurring directly before the summer months. *** reported that certain blends involved in refrigeration products are sold steadily throughout the year; however, R-410A and R-4047C are used more in the first eight months of the year when demand for AC units increases.

Four U.S. producers and five importers reported changes in the conditions of competition over the period of investigation. U.S. producers *** reported that an increase in imports of Chinese HFC blends and resulting price decreases. Additionally, *** indicated that Chinese imports are offered offseason at a discount, leading to distributors having larger inventories and changing order patterns. *** cited the expiration of HFC blend patents as major condition of competition during the period of investigation. Importers *** reported that government regulations regarding HFC blends and components have changed since 2012, specifically the restrictions on HCFC R-22.

Demand trends

Demand for HFC is derived from the demand for new residential air-conditioning and commercial refrigeration equipment and from the servicing of these equipment systems.[22] Petitioners reported using the Air-conditioning, Heating & Refrigeration Institute (AHRI) monthly updates on the number of air-conditioning units and heat pumps shipped to track demand.[23] According to the AHRI, shipments for both air-conditioning units and heat pumps have increased by *** percent since 2012.[24]

Nearly all reporting firms reported that HFC demand within and outside of the United States has increased or fluctuated since January 1, 2012 (table II-4).[25] *** indicated that changes in regulations regarding CFCs and HCFCs have increased HFC demand. *** indicated that demand for HFC within the United States has fluctuated due to the migration towards more environmentally friendly blends. Specifically, both companies indicated that demand for the blends R-404A and R-507A have declined, while demand for the blend R-407C has increased.[26]

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[22] Conference transcript, p 75. (Sassano).

[23] Conference transcript, p 75-6. (Haun) and Petitioner's postconference brief, exhibit 1, pp. 5-6.

[24] Petitioner's postconference brief, exhibit 6.

[25] Importer *** reported the demand in the United States has decreased due to low pricing of HFC and low margins.

[26] Additionally, *** indicated that demand for the blend 407F has increased, and *** indicated that demand for the blends R-410A and R-407A have increased.

Table II-4
HFC: Firms' responses regarding U.S. demand and demand outside the United States

Item	Number of firms reporting			
	Increase	No change	Decrease	Fluctuate
Demand inside the United States: U.S. producers	4	0	0	1
Importers	7	1	1	4
Demand outside the United States: U.S. producers	3	0	0	1
Importers	4	0	0	3

Source: Compiled from data submitted in response to Commission questionnaires.

Substitute products

Responding firms reported some substitutes for HFCs but that substitutability was limited. U.S. producers *** and U.S. importer *** reported that in-scope HFC can be substituted with other products. For commercial refrigeration, *** reported that hydrofluoroolefins (HFOs) are potential substitutes but that HFOs are an emerging technology and have only recently become commercially available per EPA SNAP approval. Also, for commercial refrigeration, *** reported that carbon dioxide can be substituted for HFC blends and components, but is not widely used. For air conditioning, *** reported that HCFCs can be substituted for HFCs; however, their use is highly regulated by the government due to being highly flammable.[27]

SUBSTITUTABILITY ISSUES

The degree of substitution between domestic and imported HFC depends upon such factors as relative prices, quality (e.g. reliability of supply, etc.), and conditions of sale (e.g., price discounts/rebates, lead times between order and delivery dates, payment terms, product services, etc.). Based on available data, staff believes that there is a high degree of substitutability between domestically produced HFC and HFC imported from China.

Lead times

HFC is primarily sold from inventory. U.S. producers and importers reported that approximately *** percent of their commercial shipments were sold from U.S. inventories, with lead times averaging *** days for U.S. producers and *** days for importers. The remaining U.S. producers' commercial shipments were produced to order, with lead times averaging *** days, and the remaining importers' commercial shipments came from foreign inventories, with lead times averaging *** days.

[27] *** reported that *** can be substituted for air conditioning and refrigeration and out of scope *** can be substituted for air conditioning.

Comparison of U.S.-produced and imported HFC blends and components

In order to determine whether U.S.-produced HFC can generally be used in the same applications as imports from China and nonsubject countries, U.S. producers and importers were asked whether the products can "always," "frequently," "sometimes," or "never" be used interchangeably. As shown in table II-5, most U.S. producers and importers reported that HFC components and blends produced in the United States, China, and nonsubject countries are interchangeable. Importer *** reported that both U.S.-produced HFC blends and components can sometimes be interchangeable with Chinese made product due to customer concerns regarding the quality of Chinese made product.

Table II-5
HFC: Interchangeability between HFC components and blends produced in the United States and in other countries, by country pairs

HFC components								
	U.S. producers				U.S. importers			
Country pair	A	F	S	N	A	F	S	N
United States vs. China	5	0	0	0	11	0	1	0
United States vs. Other	4	0	0	0	8	0	0	0
China vs. Other	4	0	0	0	8	0	0	0
HFC blends								
	U.S. producers				U.S. importers			
Country pair	A	F	S	N	A	F	S	N
United States vs. China	4	0	0	0	10	0	1	0
United States vs. Other	3	0	0	0	7	1	1	0
China vs. Other	3	0	0	0	7	1	0	0

Note.—A=Always, F=Frequently, S=Sometimes, N=Never.

Source: Compiled from data submitted in response to Commission questionnaires.

In addition, producers and importers were asked to assess how often differences other than price were significant in sales of HFC blends and components from the United States, China, or nonsubject countries. As seen in table II-6, most reporting U.S. producers and importers indicated that differences other than price between all country pairs were "sometimes" or "never" significant. U.S. producer *** indicated that there were "frequently" differences other than price and cited availability of supply and product range. National reported that the ability to meet industry specifications (specifically HRI700 specifications) and the ability to purchase multiple components from one source are factors affecting purchasers' decisions.[28] Importer *** indicated that purchaser preferences for domestic product

[28] Conference transcript, pp. 170-1 (Beatty and Freed).

differentiated U.S. and Chinese products. *** reported that besides price, lead times was a primary factor in purchasing decisions.[29]

Table II-6

HFC: Significance of differences other than price between HFC components and blends produced in the United States and in other countries, by country pairs

HFC components								
	U.S. producers				U.S. importers			
Country pair	A	F	S	N	A	F	S	N
United States vs. China	0	1	1	3	1	1	3	7
United States vs. Other	0	0	1	3	1	0	1	6
China vs. Other	0	0	1	3	1	0	1	6
HFC blends								
	U.S. producers				U.S. importers			
Country pair	A	F	S	N	A	F	S	N
United States vs. China	0	0	2	2	0	2	4	4
United States vs. Other	0	0	2	1	0	1	4	3
China vs. Other	0	0	2	1	0	1	4	3

Note.--A = Always, F = Frequently, S = Sometimes, N = Never.

Source: Compiled from data submitted in response to Commission questionnaires.

[29] Conference transcript, pp. 77-8 (Clark and Haun).

PART III: U.S. PRODUCERS' PRODUCTION, SHIPMENTS, AND EMPLOYMENT

The Commission analyzes a number of factors in making injury determinations (see 19 U.S.C. §§ 1677(7)(B) and 1677(7)(C)). Information on the dumping margins was presented in *Part I* of this report and information on the volume and pricing of imports of the subject merchandise is presented in *Part IV* and *Part V*. Information on the other factors specified is presented in this section and/or *Part VI* and (except as noted) is based on the questionnaire responses of five firms that accounted for all the subject HFC component production and the vast majority of subject HFC blend production during 2014.

U.S. PRODUCERS AND BLENDERS

The Commission issued a U.S. producer/blender questionnaire to 13 firms based on information contained in the petition. Five firms provided useable data on their operations of HFC component and blends production.[1] Staff believes that these responses represent all subject U.S. component production[2] and the virtually all U.S. production of subject HFC blends.[3]

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[1] "HFC" refers to all of the data gathered on each of the covered HFC blends (R-404A, R-407A, R-407C, R410A, and R-507A) and the individual HFC components (R-32, R-125, R-134a, and R-143) used to produce those blends. Data were gathered on R-134a as it was a major input into the production of three of the five covered HFC blends, although this individual HFC component was excluded from the scope of this investigation when not incorporated into a covered HFC blend. The term "covered HFC components" refers to the three individually subject HFC components (R-32, R-125, and R-143, but excluding R-134a). "U.S. producers" refer to any of the five (5) entities that reported production of any of the covered HFC blends and/or any of the covered HFC components over the period of investigation. The U.S. producers providing data are: (1) Arkema; (2) Chemours; (3) Honeywell; (4) Hudson; and (5) National. Only three of these U.S. producers reported production of HFC components in the United States, and these firms are referred to as "U.S. component producers" or "integrated producers" (Arkema, Chemours, and Honeywell). The label "independent U.S. blenders" refer to the two U.S. producers reporting only HFC blend production and no component production (Hudson and National). All five U.S. producers, however, reported blending operations on covered HFC blends, and are therefore are included in all data referencing covered HFC blends.

[2] Mexichem produces R-134a, a nonsubject component that is a semi-finished product used in the downstream subject HFC blends. Mexichem ***.

[3] As noted in *Part I*, there is another group of HFC blenders known as "HFC reclaimers "(also known as recyclers). These HFC reclaimers can also blend the subject HFC blends in their facilities. Three U.S. producers of HFC (Arkema, Honeywell, and National) are involved in the recycling and reclaiming of HFC. Conference transcript, p. 114 (Haun) and (Irani) and p. 150 (Beatty). No data was provided by HFC reclaimers or recyclers in this investigation, but respondents noted that there are "roughly 53 reclamation facilities licensed by the EPA" for HFC. Conference transcript, pp. 150-151 (Ponder).

As noted in *Part I* of this report, HFC components require a separate manufacturing facility for each component. At least two HFC components are needed to make a subject HFC blend. Not a single HFC producer in the United States manufactures all four of the HFC components, including nonsubject R-134a, that go into the five subject HFC blends. As a result, all three HFC component producers in the United States are engaged in swapping arrangements with other HFC component producers to make HFC blends. In addition, all HFC components producers as well as HFC blenders import and/or purchase the HFC components necessary to make HFC blends.

Table III-1 lists U.S. component producers and blenders of HFC, their production locations, positions on the petition and shares of total production. Arkema is ***. Chemours ***.[4] Honeywell ***.

Table III-1
HFC: U.S. producers, their position on the petition, location of production, and share of reported production, January 2012 through March 2015

Firm	Position on petition	Production location(s)	Share of component production (percent)					Share of blend production (percent)
			Subject			Nonsubject	All components	
			R-32	R-125	R-143a	R-134a[1]		
Arkema[2]	Support	Calvert City, KY	***	***	***	***	***	***
Chemours	Support	Louisville, KY Ingleside, TX Deepwater, NJ	***	***	***	***	***	***
Honeywell[3]	Support	Baton Rouge, LA Geismar, LA	***	***	***	***	***	***
Hudson	Support	Champaign, Illinois	***	***	***	***	***	***
National	Oppose[4]	Rosenhayn, NJ	***	***	***	***	***	***
Total			***	***	***	***	***	***

[1] R-134a is not a subject HFC component, but it is used as an ingredient in blending three out of five of the subject HFC blends.
[2] Arkema is related to ***.
[3] Honeywell is ***.
[4] National takes no position on the petition with respect to HFC blends as a separate like product. Conference transcript, p. 143.

Source: Compiled from data submitted in response to Commission questionnaires.

Table III-2 presents data on U.S. producers' production of HFC as well as nonsubject products. One HFC producer, ***. Two HFC producers, (***), reported producing nonsubject blends using the same equipment as subject blends.

Table III-2
HFC: U.S. producers' overall capacity and production on the same equipment as subject production, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

[4] Chemours reported that ***.

U.S. PRODUCTION, CAPACITY, AND CAPACITY UTILIZATION

Table III-3 presents U.S. producers' production, capacity, and capacity utilization, figure III-1 shows this activity by U.S. producers' component operations, and figure III-2 shows this activity by U.S. producers' blending operations.

Table III-3
HFC: U.S. producers' and blenders' capacity, production, and capacity utilization, 2012-14, January to March 2014, and January to March 2015

Item	Calendar year			January to March	
	2012	2013	2014	2014	2015
	Quantity (short tons)				
HFC components: Capacity	162,590	162,275	159,251	***	***
Production	123,826	124,242	117,896	***	***
	Ratio (percent)				
Capacity utilization	76.2	76.6	74.0	84.5	67.7
	Share of production by component (percent)				
Share of HFC component production: R-32	98,645	100,136	102,726	***	***
R-125	50,369	58,974	61,484	***	***
R-134a[1]	98,645	100,136	102,726	***	***
R-143a	51.1	58.9	59.9	***	***
	Quantity (short tons)				
HFC blends: Capacity	98,645	100,136	102,726	***	***
Production	50,369	58,974	61,484	***	***
	Ratio (percent)				
Capacity utilization	51.1	58.9	59.9	***	***
	Share of production by blend (percent)				
Share of HFC blend production: R-404A[1]	***	***	***	***	***
R-407A[1]	***	***	***	***	***
R-407C[1]	***	***	***	***	***
R-410A	***	***	***	***	***
R-507A	***	***	***	***	***
	Share of production by origin of component (percent)				
Share of HFC blend production: Internal consumption (net of swaps)	***	***	***	***	***
Commercial purchases domestic components	***	***	***	***	***
Domestic sources	***	***	***	***	***
Imported components China	***	***	***	***	***
Imported components all other sources	***	***	***	***	***
Import sources	***	***	***	***	***

[1] R-134a is not a subject HFC component, but it is used as an ingredient in blending three out of five of the subject HFC blends (R-404A, R-407A, and R-407C).

Source: Compiled from data submitted in response to Commission questionnaires.

Figure III-1
HFC: U.S. producers' component capacity, production, and capacity utilization, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

Figure III-2
HFC: U.S. producers' blending capacity, production, and capacity utilization, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

U.S. Component Producers

Table III-4 presents information on U.S. component producers' ownership, related and/or affiliated firms, and the extent of affiliation or ownership. No independent blender reported any related and/or affiliated firms.

Table III-4
HFC: U.S. component producers' ownership, related and/or affiliated firms

* * * * * * *

As discussed in table III-12 and appendix D, all three U.S. producers of HFC components directly import the subject merchandise and none reported purchases of the subject merchandise from U.S. importers from 2012 to March 2015.

In addition, each of three U.S. producers of HFC components also blend HFC using swap agreements to access the HFC components that it does not produce.[5] Table III-5 presents details on these swap agreements for both subject HFC components and the nonsubject HFC component, R-134a. HFC producers of components in the United States swap subject HFC components for the nonsubject HFC component R-134a to be used in their production of subject HFC blends because nonsubject R-134a is used as an ingredient in three out of five subject HFC blends.[6] Independent blenders are not part of swap agreements for HFC components since they do not produce HFC components.

Table III-5
HFC components: U.S. producers' reported swap agreements from 2012 to March 2015

* * * * * * *

[5] Petitioners contend that swapping contracts ***. Petitioners' postconference brief, p. 24.

[6] As of July 2014, Chemours only produces the nonsubject HFC component, R-134a, as well as subject HFC blends. According to Chemours, ***.

Table III-6 presents information on U.S. producers of HFC components' reported changes in operations from 2012 to March 2015.

Table III-6
HFC: U.S. producers' reported changes in operations from 2012 to March 2015

* * * * * * *

U.S. Independent Blenders

National is by far the largest independent blender of HFC in the United States. Several other firms were listed as possible independent blenders in the petition, but indicated that they have not blended the subject HFC products during 2012 to March 2015.[7] National reported importing subject HFC components only for use in its blending operations. National did not import any subject HFC blends. National also purchased HFC components from domestic producers throughout the period examined. ***. Table III-12 and appendix D provide more information on National and Hudson's direct imports and purchase of HFC.

In the HFC blending business, the subject HFC blends make up approximately 99 percent of all HFC blends in the U.S. market.[8] There is another group of HFC blenders, known as reclaimers or recyclers who take all of the subject HFCs, "along with 50 others," including R-22 and R-12 (both of these have been phased out since the 1990s but are still used in the replacement market today). The reclamation centers collect "dirty refrigerant or refrigerants that are used in the marketplace," clean them according to ARI 700 standard, and re-introduce the cleaned HFC into the market.[9] [10]

The two responding independent U.S. blenders, National and Hudson, are ***. Neither firm reported any changes to its operations from 2012 to March 2015 and do not expect any future changes to their operations on HFC.

U.S. PRODUCERS' U.S. SHIPMENTS AND EXPORTS

Table III-7 presents U.S. producers' U.S. shipments, export shipments, and total shipments of HFC components. Internal consumption accounted for between *** percent to *** percent of U.S. producers' total shipments of HFC components from 2012 to March 2015. No transfers to related firms for HFC components were reported from 2012 to March 2015.[11]

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[7] *** provided the Commission with certified "no" responses to the U.S. producer/blender questionnaire on HFC.

[8] The additional HFC blends, including patented and proprietary, that are not subject to this investigation account for approximately "one percent" of the HFC market in the United States. Conference transcript, p. 49 (Sassano).

[9] Conference transcript, pp. 148-149 (Ponder).

[10] One firm, ***.

[11] Swap arrangements are not reported as transfers to related firms.

The quantity of U.S. producers' total shipments fluctuated from 2012 to 2014, but declined from 2012 to 2014. Both the value and unit value of U.S. producers' total shipments declined from 2012 to 2014, and were lower in January-March 2015 than January-March 2014. U.S. producers reported exporting HFC components to ***.

Table III-7
HFC: U.S. producers' U.S. shipments, export shipments, and total shipments of components, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

Table III-8 presents data on U.S. producers' U.S. shipments, export shipments, and total shipments of HFC blends. No U.S. producer reported internal consumption or transfers to related firms for HFC blends from 2012 to March 2015. The quantity of U.S. producers' total shipments of blends increased from 2012 to 2014, but was lower in interim 2015 than in interim 2014. Both value and unit value of U.S. producers' total shipments of blends declined from 2012 to 2014, with a sharp decline from 2012 to 2013, and were lower in January-March 2015 when compared to January-March 2014. U.S. producers reported exporting HFC blends to ***.

Table III-8
HFC: U.S. producers' U.S. shipments, export shipments, and total shipments of blends, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

Table III-9 presents data on U.S. producers' commercial U.S. shipments of HFC components by channel and by product type for 2014. By volume, R-32 accounted for a majority of the volume of subject HFC components shipped in the United States in 2014 while R143a comprised the smallest proportion of subject HFC components shipped in the United States that year. The vast majority of all three subject HFC components were shipped to blenders and repackagers. The nonsubject HFC component R-134a was by far the largest volume HFC component shipped in the United States in 2014, due to its independent use in automotive air conditioners.[12]

Table III-9
HFC: U.S. producers' commercial U.S. shipments of components by product and by channel, 2014

* * * * * * *

[12] Conference transcript, p. 30 (Sassano) and pp. 53-54 (Sassano).

Table III-10 presents data on U.S. producers' commercial U.S. shipments of HFC blends by channel and product type for 2014. By volume, R-410A accounted for a majority of the volume of HFC blends shipped in the United States in 2014 while R407C comprised the smallest proportion of HFC blends shipped in the United States in 2014. The vast majority of HFC blends were shipped to either distributors and service companies (*** percent) or to OEMs (*** percent) in 2014.

Table III-10
HFC: U.S. producers' commercial U.S. shipments of blends by product and by channel, 2014

* * * * * * *

U.S. PRODUCERS' AND BLENDERS' INVENTORIES

Table III-11 presents end-of-period inventories and the ratio of these inventories of HFC components and blends to U.S. producers' production, U.S. shipments, and total shipments from 2012 to March 2015.

Table III-11
HFC: U.S. producers' and U.S. blenders' inventories, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

U.S. PRODUCERS' AND BLENDERS' IMPORTS AND PURCHASES

U.S. producers' imports and purchases of HFC are presented in table III-12. All five U.S. producers imported HFC components to use in blends during the period of investigation. Data on U.S. producers' imports include imports of R-134a, a nonsubject HFC component, since it is a necessary component in the downstream production of three out of five subject HFC blends. See appendix D for detailed production and import data on HFC imports and purchases by all five U.S. producers.

Table III-12
HFC: Summary ratios for related party analysis, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

U.S. EMPLOYMENT, WAGES, AND PRODUCTIVITY

Table III-13 shows U.S. producers' employment-related data during the period examined. U.S. producers employed more workers to blend HFC than to produce HFC components from 2012 to March 2015, but the wages paid workers for HFC components production (ranging from $*** per hour to $*** per hour) were consistently higher than the wages paid workers for HFC blends production (ranging from $*** per hour to $*** per hour).

Table III-13
HFC: U.S. producers' and U.S. blenders' employment related data, 2012-14, January to March 2014, and January to March 2015

Item	Calendar year			January to March	
	2012	2013	2014	2014	2015
HFC components: Production-Related Workers (PRWs) (number)	149	156	154	152	108
Total hours worked (1,000 hours)	346	362	357	88	64
Hours worked per PRW (hours)	2,322	2,321	2,318	579	593
Wages paid ($1,000)	14,077	14,939	14,948	3,737	2,751
Hourly wages (dollars per hour)	40.68	41.27	41.87	42.47	42.98
Productivity (short tons per 1,000 hours)	357.9	343.2	330.2	406.6	297.3
Unit labor costs (dollars per short ton)	113.68	120.24	126.79	104.44	144.57
HFC blends: Production-Related Workers (PRWs) (number)	191	209	231	213	215
Total hours worked (1,000 hours)	368	417	467	110	109
Hours worked per PRW (hours)	1,929	1,995	2,022	516	507
Wages paid ($1,000)	8,656	10,593	11,917	2,920	2,751
Hourly wages (dollars per hour)	23.50	25.40	25.52	26.55	25.24
Productivity (short tons per 1,000 hours)	136.7	141.4	131.7	142.1	126.6
Unit labor costs (dollars per short ton)	171.85	179.62	193.82	186.75	199.33

Note.—Data in this table includes all four HFC components, including nonsubject R-134a.

Source: Compiled from data submitted in response to Commission questionnaires.

PART IV: U.S. IMPORTS, APPARENT U.S. CONSUMPTION, AND MARKET SHARES

U.S. IMPORTERS

The Commission issued importer questionnaires to 35 firms believed to be importers of subject HFC, as well as to all U.S. producers of HFC.[1] [2] Usable questionnaire responses were received from 14 companies,[3] these companies accounted for approximately two-thirds (*** percent) of the merchandise imported under the most relevant HTS statistical reporting numbers (2903.39.2030 for subject HFC components and 3824.78.0000 for HFC blends)[4] based on an analysis of proprietary Customs data. However, both HTS numbers listed in the petition are "basket categories" that include merchandise outside of the scope of this investigation, the aggregate quantity of imports reported by these 14 firms in their questionnaire submissions accounted for a little over two fifths (*** percent) of the public import statistics.[5] Table IV-1

[1] "HFC" refers to all of the data gathered on each of the covered HFC blends (R-404A, R-407A, R-407C, R410A, and R-507A) and the individual HFC components (R-32, R-125, R-134a, and R-143) used to produce those blends. Data were gathered on R-134a as it was a major input into the production of three of the five covered HFC blends, although this individual HFC component was excluded from the scope of this investigation when not incorporated into a covered HFC blend. The term "covered HFC components" refers to the three individually subject HFC components (R-32, R-125, and R-143, but excluding R-134a). "U.S. producers" refer to any of the five (5) entities that reported production of any of the covered HFC blends and/or any of the covered HFC components over the period of investigation. The U.S. producers providing data are: (1) Arkema; (2) Chemours; (3) Honeywell; (4) Hudson; and (5) National. Only three of these U.S. producers reported production of HFC components in the United States, and these firms are referred to as "U.S. component producers" or "integrated producers" (Arkema, Chemours, and Honeywell). The label "independent U.S. blenders" refer to the two U.S. producers reporting only HFC blend production and no component production (Hudson and National). All five U.S. producers, however, reported blending operations on covered HFC blends, and are therefore are included in all data referencing covered HFC blends.

[2] The Commission issued questionnaires to those firms identified in the petition, along with firms that, based on a review of data provided by U.S. Customs and Border Protection ("Customs"), may have accounted for more than one percent of total imports under statistical reporting numbers 2903.39.2030 and 3824.78.0000 in 2014.

[3] U.S. importer, Enviro-Safe Refrigerants ("Enviro-Safe") provided ***.

[4] The HTS categories (for both fluorocarbon chemicals and mixtures) probably have a wide variety of products in addition to refrigerants. Both provisions probably have chemicals and mixtures used for chemical synthesis, as well as finished products destined for specialty plastics, dielectric and cooling fluids in electric and transformer applications, and some medical uses – artificial blood or blood substitute, and anesthetics (such as operating room anesthesia).

[5] Comparing the questionnaire data and public data for components separately from blends, staff believes questionnaire data demonstrate that HFC blends have been classified in provisions other than statistical reporting number 3824.78.0000 over the period of investigation since the responding U.S. importers' questionnaire data for HFC blends exceed what is reported in official import statistics. For

(*continued*...)

lists all responding U.S. importers of HFC from China and other sources, their locations, and their shares of reported U.S. imports, from 2012 to 2014. According to responding U.S. importers, the leading U.S. importers of HFC components from China are National (***), Chemours (***), and *** (***), while the leading importers of HFC blends from China are ***. The leading nonsubject importer of HFC components is ***, while the leading importer of nonsubject HFC blends is Mexichem, with imports from Mexico.

Table IV-1
HFC: U.S. importers, their headquarters, and share of total imports by source, January 2012 through December 2014

		Firm's share of imports by type of imported product and source					
		Share of covered HFC components (percent)			Share of covered HFC blends (percent)		
Firm	Headquarters	China	All other sources	All sources	China	All other sources	All sources
Airgas	Lawrenceville, GA	***	***	***	***	***	***
Arkema	King Of Prussia, PA	***	***	***	***	***	***
BMP	Tampa, FL	***	***	***	***	***	***
Chemours	Wilmington, DE	***	***	***	***	***	***
Coolgas	Bowling Green, OH	***	***	***	***	***	***
Daikin America	Orangeburg, NY	***	***	***	***	***	***
Honeywell	Morristown, NJ	***	***	***	***	***	***
Hudson	Pearl River, NY	***	***	***	***	***	***
ICOR	Indianapolis, IN	***	***	***	***	***	***
Mexichem	St. Gabriel, LA	***	***	***	***	***	***
National	Philadelphia, PA	***	***	***	***	***	***
R.E. Michel	Glen Burnie, MD	***	***	***	***	***	***
USA Refrigerants	Sarasota , FL	***	***	***	***	***	***
Weitron	Newark, DE	***	***	***	***	***	***
Total		***	***	***	***	***	***

Source: Compiled from data submitted in response to Commission questionnaires.

U.S. IMPORTS

Table IV-2 and figure IV-1 present data for U.S. imports of HFC components from China and all other sources. China accounted for the vast majority of U.S. imports of HFC components in 2012-2013 and all of the U.S. imports of HFC components in 2014 and January to March 2015.

(…*continued*)
individual subject HFC components being reported under the 2903.39.2030, staff believes that this provision includes imports of subject HFC components but also includes a variety of other fluorinated hydrocarbons not covered by these proceedings.

Table IV-2
HFC: U.S. imports of HFC components, by source, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

Figure IV-1
HFC: U.S. import volumes and prices HFC components, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

Table IV-3 and figure IV-2 present data for U.S. imports of HFC blends from China and all other sources. Similar to the trend for U.S. imports of HFC components, China dominated the U.S. imports for blends, accounting for the majority of U.S. imports of HFC blends in 2012 and 2013, the vast majority of U.S. import of HFC blends in 2014, and all of the U.S. imports of HFC blends from January to March 2015.

Table IV-3
HFC: U.S. imports of HFC blends, by source, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

Figure IV-2
HFC: U.S. import volumes and prices HFC blends, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

Tables IV-4 and IV-5 present data on U.S. importers' U.S. shipments, export shipments, and total shipments of HFC components from China and nonsubject sources, respectively. As shown in table IV-4, the vast majority, *** percent to *** percent, of U.S. importers' imports of subject HFC components from China were consumed internally or transferred to related firms. Similarly, table IV-5 shows that *** of U.S. importers' imports of subject HFC components from nonsubject sources were consumed internally or transferred to related firms. U.S. imports of subject HFC components from China accounted for the vast majority of overall U.S. imports of HFC components in 2012 and 2013, and accounted for almost all of the U.S. imports of HFC components starting in 2014.

Table IV-4
HFC: U.S. importers' U.S. shipments, export shipments, and total shipments of covered HFC components imported from China, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

Table IV-5
HFC: U.S. importers' U.S. shipments, export shipments, and total shipments of covered HFC components imported from nonsubject sources, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

Tables IV-6 and IV-7 present data on U.S. importers' U.S. shipments, export shipments, and total shipments of HFC blends from China and nonsubject sources, respectively. As shown in table IV-6, the vast majority of U.S. importer shipments of HFC blends from China were commercial U.S. shipments. Similarly, table IV-7 shows that the vast majority of U.S. importer shipments of subject HFC components from all other sources were commercial U.S. shipments.

Table IV-6
HFC: U.S. importers' U.S. shipments, export shipments, and total shipments of covered HFC blends imported from China, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

Table IV-7
HFC: U.S. importers' U.S. shipments, export shipments, and total shipments of covered HFC components imported from nonsubject sources, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

Table IV-8 presents data on U.S. importers' commercial shipments of imported components from China by channel of distribution and by product type in 2014. The vast majority of U.S. importer commercial shipments were of nonsubject R-134a, with *** percent of total shipments accounted for by the subject HFC components in 2014.

Table IV-8
HFC: U.S. importers' commercial U.S. shipments of imports of components from China by product and by channel, 2014

* * * * * * *

Table IV-9 presents data on U.S. importers' commercial shipments of imported blends from China by channel of distribution and by product type in 2014. U.S. importers primarily shipped imported R-410A (*** percent) and R-404A (*** percent) from China, mostly to distributors and service companies that year.

Table IV-9
HFC: U.S. importers' commercial U.S. shipments of imports of blends from China by product and by channel, 2014

* * * * * * *

Table IV-10 presents data on U.S. importers' commercial shipments of imported components from nonsubject sources by channel of distribution and by product type in 2014. No U.S. importers reported shipping any of the three subject HFC components imported from nonsubject sources in 2014 and reported shipping only the nonsubject HFC component R-134a to distributor and service companies and blenders and repackagers that year.

Table IV-10
HFC: U.S. importers' commercial U.S. shipments of imports of components from nonsubject sources by product and by channel, 2014

* * * * * * *

Table IV-11 presents data on U.S. importers' commercial shipments of imported blends from nonsubject sources by channel of distribution and by product type from 2012 to March 2015. U.S. importers primarily shipped two types HFC blends from nonsubject sources (R-410A and R-407A) in 2014, with a very tiny amount of a third HFC blend, R-407C.

Table IV-11
HFC: U.S. importers' commercial U.S. shipments of imports of blends from nonsubject sources by product and by channel, 2014

* * * * * * *

NEGLIGIBILITY

The statute requires that an investigation be terminated without an injury determination if imports of the subject merchandise are found to be negligible.[6] Negligible imports are generally defined in the Tariff Act of 1930, as amended, as imports from a country of merchandise corresponding to a domestic like product where such imports account for less than 3 percent of the volume of all such merchandise imported into the United States in the most recent 12-month period for which data are available that precedes the filing of the petition or the initiation of the investigation. However, if there are imports of such merchandise from a number of countries subject to investigations initiated on the same day that individually account for less than 3 percent of the total volume of the subject merchandise, and if the imports from those countries collectively account for more than 7 percent of the volume of all such merchandise imported into the United States during the applicable 12-month period, then imports from such countries are deemed not to be negligible.[7] Imports from China accounted for 90 percent of total imports of HFC by quantity from June 2014 to May 2015.

[6] Sections 703(a)(1), 705(b)(1), 733(a)(1), and 735(b)(1) of the Act (19 U.S.C. §§ 1671b(a)(1), 1671d(b)(1), 1673b(a)(1), and 1673d(b)(1)).

[7] Section 771 (24) of the Act (19 U.S.C § 1677(24)).

APPARENT U.S. CONSUMPTION AND MARKET SHARES

Table IV-12 and figure IV-3 present data on apparent U.S. consumption and U.S. market shares for HFC.[8] Apparent consumption, based on quantity, increased by *** percent during the 2012-14 period while apparent consumption, based on value, decreased by *** percent during the 2012-14 period. U.S. producers' share of apparent consumption declined from 2012 to 2014, by *** percentage points by quantity and *** percentage points by value. The market share of HFC imports from China, by quantity, more than doubled from 2012 to 2014, increasing from *** percent in 2012 to *** percent in 2014, and was higher in January-March 2015 than in January-March 2014. Similarly, the market share of HFC imports from China, by value, almost tripled from 2012 to 2014, increasing from *** percent in 2012 to *** percent in 2014, and was higher in January-March 2015 than in January-March 2014.

Table IV-12
HFC: Apparent U.S. consumption and market shares, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

Figure IV-3
HFC: Apparent U.S. consumption, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

Table IV-13 presents data on U.S. imports of HFC by U.S. component producers and independent blenders. Overall, U.S. imports of HFC controlled by U.S. producers and independent blenders (these are direct U.S. imports of components by U.S. producers used to produce downstream HFC blends) more than doubled from 2012 to 2014, and also increased from January to March 2015 when compared with January to March 2014.

Table IV-13
HFC: Subject U.S. imports controlled by U.S. producers, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

[8] For the purpose of apparent consumption and in order to report a single unified apparent consumption analysis without double counting merchandise between levels of production, U.S. producers' U.S. shipment quantity represents (1) U.S. producers' commercial U.S. shipments of HFC components in the United States (adjusted for any sales to blenders in the data set, e.g., the blender is reporting a further processed version of that domestic product) plus (2) U.S. producers' internal consumption of HFC components not accounted for in the production of covered HFC blends (e.g. use of HFC components to produce out of scope HFC blends), plus (3) U.S. producers' U.S. shipments of HFC blends in the United States (adjusted for the amount produced from imported components). U.S. producers' U.S. shipment value data is further adjusted to add in the value attributable to U.S. blending operations and/or profits conducted on imported components.

PART V: PRICING DATA

FACTORS AFFECTING PRICES

Raw material costs

The primary raw material used in the production of HFC components is hydrofluoric acid (HF). Four responding U.S. producers reported that raw material costs either increased or fluctuated since January 2012. *** reported that HF prices increased from January 2012 to March 2015 by *** percent. *** reported that HF prices increased from January 2012 to March 2015 by *** percent. *** reported that HF prices increased from January 2012 to March 2015 by *** percent.[1] In addition to HF, U.S. producers reported that *** is used to make R-32; *** to make R-125; and methyl chloroform to make R-143a. All U.S. producers reported buying most their raw materials through long-term contracts.[2] *** reported that prices for *** have decreased, and *** reported that the price for *** decreased.[3] In total, U.S. producers' raw materials costs as a share of the cost of goods sold (COGS) fluctuated from 2012 to 2014, decreasing from 76.9 percent in 2012 to 70.4 percent in 2013, and then increasing to 72.5 percent in 2014. It was 74.0 percent in in the first quarter of 2015. Chinese producer *** reported that its raw material prices dropped by *** percent from January 2012 to June 2015.[4]

U.S. inland transportation costs

All responding U.S. producers and importers reported that they typically arrange transportation to their customers. U.S. producers reported that their U.S. inland transportation costs ranged from 1.0 to 11.0 percent, averaging 4.7 percent; while importers reported costs of 1.0 to 17.0 percent, averaging 6.1 percent.[5]

PRICING PRACTICES

Pricing methods

U.S. producers and importers reported primarily using transaction-by-transaction negotiations to set prices, although some firms also use contracts and set price lists (table V-1). U.S. producer and importer *** reported that its prices are also set by ***.

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[1] Petitioners' postconference brief, exhibit 19.

[2] Petitioners' postconference brief, exhibit 11, pp. 4-6.

[3] Petitioners' postconference brief, exhibit 19.

[4] Chinese producers' postconference brief, exhibit 21.

[5] Importers *** and *** reported U.S. inland transportation costs of 0.0 and 100.0 percent, respectively, and these data were not included in the calculations.

Table V-1

HFC components and blends: U.S. producers and importers reported price setting methods, by number of responding firms[1]

Method	U.S. producers	Importers
Transaction-by-transaction	5	10
Contract	3	4
Set price list	3	2
Other	1	3

[1] The sum of responses down may not add up to the total number of responding firms as each firm was instructed to check all applicable price setting methods employed.

Source: Compiled from data submitted in response to Commission questionnaires.

U.S. producers and importers reported selling the vast majority of their product in the spot market, as shown in table V-2. U.S. producers *** also reported using long-term contracts ranging from *** years.

Table V-2

HFC components and blends: U.S. producers' and importers' shares of U.S. commercial shipments by type of sale, 2014

* * * * * * *

Sales terms and discounts

U.S. producers and importers typically quote prices on a delivered basis.[6] Three of five responding U.S. producers reported offering total volume discounts, whereas 11 of 13 responding importers reported not offering discounts. In addition, U.S. producer and importer *** reported offering ***, U.S. producer and importer *** reported offering ***, U.S. producer *** reported offering ***, and importer *** reported offering ***. A majority of responding U.S. producers and importers reported sales terms of net 30 days.

PRICE DATA

The Commission requested U.S. producers and importers to provide quarterly data for January 2012-March 2015 for the total quantity and f.o.b. value for the following four HFC blends (products 1-4) and two components (products 5-6).

Product 1.—R-410A in bulk containers (1,000 lbs. or greater);

Product 2.—R-410A in 25-lb. disposable tanks or cylinders;

[6] Importer *** reported selling on an f.o.b China basis.

Product 3.—R-404A in 24-lb. disposable tanks or cylinders;

Product 4.—R-407C in 25-lb. disposable tanks or cylinders;

Product 5.—R-32 in bulk containers (1,000 lbs. or greater);

Product 6.—R-125 in bulk containers (over 1,000 lbs.)

U.S. producers and importers were requested to provide data for shipments to unrelated U.S. customers. In addition, firms that imported HFC blends or components for their own use (i.e., blenders that imported components or OEMs that imported blends or components) were requested to provide import purchase cost data. Five U.S. producers[7] and four importers[8] provided usable pricing data for sales, and eight importers provided direct import purchase cost data for the requested products, although not all firms reported pricing for all products for all quarters.[9]

Over the period of investigation, Chinese importers reported sales and direct import purchase costs of all pricing products. Pricing data for sales of HFC blends (products 1-4) accounted for 78.5 percent of reported Chinese imports from January 2012 to March 2015, and direct import cost data accounted for 13.6 percent of reported Chinese imports from January 2012 to March 2015. ***, followed by ***, reported the highest volume of sales data for HFC blends, and *** was the only importer to report direct import purchase cost data for HFC blends. Direct import purchase cost data of HFC components (products 5 and 6) accounted for 90.6 percent of the reported Chinese imports from January 2012 to March 2015, and pricing data for sales of HFC components accounted for 0.2 percent of reported Chinese imports from January 2012 to March 2015. ***, followed by ***, reported the highest volume of direct import purchase cost data for HFC components, and *** reported the highest volume of sales data for HFC components.

[7] The U.S. producers were asked to provide their sales of blended pricing products 1-4 and the shares of each product that consisted of domestic components versus imported components. Nearly all of *** blends of pricing products 1-4 used domestically produced components. *** blends of pricing products 1-4 were comprised of *** percent of Chinese produced components. *** reported using only Chinese components for pricing product 2.

[8] *** provided updated pricing and trade data on July 31, 2015. The updated pricing data was in excess of trade data and the update to both sections was not included in the report.

[9] Per-unit pricing data are calculated from total quantity and total value data provided by U.S. producers and importers. The precision and variation of these figures may be affected by rounding, limited quantities, and producer or importer estimates.

Pricing data for sales of HFC blends reported by these firms accounted for approximately 90.0 percent of U.S. producers' commercial shipments[10] of HFC blends and 96.4 percent of U.S. commercial shipments of HFC blend imports from China in 2014. Pricing data for HFC components reported by these firms accounted for *** percent of U.S. producers' commercial shipments of HFC components and 98.8 percent of U.S. commercial shipments of HFC component imports from China in 2014.

Price data for products 1-6 are presented in tables V-3 to V-8 and figures V-1 to V-6.

Table V-3

HFC: Weighted-average f.o.b. prices and quantities of domestic and imported product 1[1] and margins of underselling/(overselling), by quarters, January 2012-March 2015

* * * * * * *

Table V-4

HFC: Weighted-average f.o.b. prices and quantities of domestic and imported product 2[1] and margins of underselling/(overselling), by quarters, January 2012-March 2015

* * * * * * *

Table V-5

HFC: Weighted-average f.o.b. prices and quantities of domestic and imported product 3[1] and margins of underselling/(overselling), by quarters, January 2012-March 2015

* * * * * * *

Table V-6

HFC: Weighted-average f.o.b. prices and quantities of domestic and imported product 4[1] and margins of underselling/(overselling), by quarters, January 2012-March 2015

* * * * * * *

Table V-7

HFC: Weighted-average f.o.b. prices and quantities of domestic and imported product 5[1] and margins of underselling/(overselling), by quarters, January 2012-March 2015

* * * * * * *

Table V-8

HFC components: Weighted-average f.o.b. prices and quantities of domestic and imported product 6[1] and margins of underselling/(overselling), by quarters, January 2012-March 2015

* * * * * * *

[10] Direct imports are not counted in commercial shipments because direct imports are consumed internally, and not sold to unrelated firms.

Figure V-1

HFC: Weighted-average prices and quantities of domestic and imported product 1, by quarters, January 2012-March 2015

* * * * * * *

Figure V-2

HFC: Weighted-average prices and quantities of domestic and imported product 2, by quarters, January 2012-March 2015

* * * * * * *

Figure V-3

HFC: Weighted-average prices and quantities of domestic and imported product 3, by quarters, January 2012-March 2015

* * * * * * *

Figure V-4

HFC: Weighted-average prices and quantities of domestic and imported product 4, by quarters, January 2012-March 2015

* * * * * * *

Figure V-5

HFC: Weighted-average prices and quantities of domestic and imported product 5, by quarters, January 2012-March 2015

* * * * * * *

Figure V-6

HFC: Weighted-average prices and quantities of domestic and imported product 6, by quarters, January 2012-March 2015

* * * * * * *

Price trends

Domestic and Chinese sales prices for all products decreased over the period of investigation. Table V-9 summarizes the price trends, by product and by country. Domestic sales price decreases of HFC blends (products 1-4) ranged from 24.6 to 48.9 percent during the period of investigation while import sales price decreases of HFC blends ranged from 14.0 to 49.2 percent. As firms noted in response to the business cycle question (see Part II), domestic sales quantities of HFC blends fluctuated seasonally, in anticipation of warmer, summer months. Sales quantities of domestically produced HFC blends peaked during the second quarter of each full year for the period of investigation, and were typically at their lowest

during the fourth quarter.[11] Direct import purchase costs decreases of HFC blends ranged from 6.8 to 20.4 percent during the period of investigation. For each of the HFC blends, the direct import cost was highest in the first quarter reported (first quarter of 2013 for products 1-3 and last quarter of 2012 for product 4).

Domestic sales price decreases of HFC components (products 5-6) ranged from 3.5 to 48.3 percent during the period of investigation while import sales price decreases of HFC components ranged from 31.8 to 57.8 percent. Domestic sales of product 6 showed the most volatile pricing and quantity trends. Domestic sales prices of product 6 peaked the third quarter of each full year for the period of investigation and the sales quantities were at the lowest during the third quarter.[12] Direct import purchase costs decreases of HFC components ranged from 17.5 to 43.4 percent during the period of investigation. Approximately *** percent of the total direct import volume for product 6 was reported in the second and third quarter of 2013, and the lowest direct import cost for product 6 also occurred in the second quarter of 2013.

Table V-9

HFC components and blends: Summary of weighted-average f.o.b. sales prices and purchase costs for products 1-6 from the United States and China

* * * * * * *

U.S. producers attribute the decrease in prices over the period of investigation to the presence of Chinese HFC imports; however, respondents and importer *** attribute the decline in prices to the expiration of patents and changes to environmental regulations. Chinese producers and importer National indicated that prices fell over the period of investigation due the expiration of several patents in 2011 held by the U.S. producers on HFC blends thereby lowering cost of producing HFC.[13] U.S. producers reported that the patents expired by January 2011, nearly a year before the period of investigation.[14] Importer New Era indicated that the adjustment of the EPA's allowances on HCFCs, particularly R-22, caused prices in the HFC market to drop due to the increase in available substitutes.[15]

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[11] Sales quantities of U.S. and Chinese HFC component and Chinese HFC blends did not follow a similar seasonal pattern.

[12] Importers provided sales data for product 5 for *** quarters of data.

[13] Conference transcript, pp. 126-7 (Marshank), conference transcript, pp. 130-131 (Beatty), and Respondent National's postconference brief, Exhibit 1, p 12.

[14] The patent for R-507A expired in May 2010. The patents for R410A, R407A, and R407C expired in December 2010, and the patent for R-404A expired in January 2011. Conference transcript, p 68 (Sassano) and Petitioners' postconference brief, exhibit 8.

[15] Due to the Court of Appeal's ruling on Arkema v. EPA, the EPA modified the 2009 final rule titled "Protection of Stratospheric Ozone: Adjustments to the Allowance System for Controlling HCFC Production, Import, and Export" to establish company-by-company HCFCs R-22 and R-142b baselines and to allocate production and consumption allowances for 2012-2014. *Protection of Stratospheric Ozone: Adjustments to the Allowance System for Controlling HCFC Production, Import, and Export,* 78 FR 20004, April 3, 2013, and New Era Group postconference submission, p. 2.

Price comparisons

As shown in table V-10, sales prices for HFC blends and components imported from China were below those for U.S.-produced product in 44 of 55 instances (*** pounds); margins of underselling ranged from *** to *** percent. In the remaining *** instances (*** pounds), margins of overselling ranged from *** to *** percent. HFC components had *** instances for comparison, and U.S.-produced HFC components oversold components imported from China in *** of *** of instances. However, HFC components only represent less than *** percent of total volume in price comparisons.

Table V-10
HFC components and blends: Instances of underselling/overselling and the range and average of margins, by country, January 2012-March 2015

* * * * * * *

Direct import purchase costs

For importers that reported direct imports, the Commission also asked them to report the value of additional direct importing costs that are above and beyond the landed duty-paid cost, by quarter. Only two responding importers (***) provided data for additional costs on a quarterly basis for components (products 5-6). For components, both importers reported that additional costs accounted for less than *** per pound of HFC component. *** indicated that the additional costs were from broker fees and marine insurance.[16] Importer *** did not separate out additional costs from the landed duty-paid value, but report that *** percent of the value went towards customs, duty, and entry fees.[17]

Importers were also asked to identify the benefits of directly importing HFC instead of purchasing HFC from a U.S. producer or importer. Four importers, ***, indicated better pricing for the Chinese imports as a benefit to directly importing. *** also identified the ability to import enough HFC components from a single source to meet its production needs. *** indicated that due to domestic producers' restrictions on selling HFC components, *** has to contact multiple domestic producers to supply different HFC components. Additionally, *** reported that domestic producers are restricted from selling components manufactured by another domestic producer unless the component is a part of a blend. *** reported needing to purchase additional volumes of HFC to cover for a production issue.[18]

[16] Firms were asked to describe the types of costs incurred, such as logistical or supply chain costs, warehousing costs, compliance or customs costs, insurance costs, and currency conversion costs.

[17] Email from ***, July 14, 2015, Edis no. 561001.

[18] *** reported directly importing *** pounds of product 5 (R-32) in the first quarter of 2015.

LOST SALES AND LOST REVENUE

The Commission requested U.S. producers of HFC blends and components to report any instances of lost sales or revenue they experienced due to competition from imports of HFC blends and components from China since January 1, 2012. All five of the responding U.S. producers reported that they had to reduce prices to avoid losing sales to Chinese imports of HFC. Three of five responding U.S. producers indicated that they had to roll back announced price increases to avoid losing sales to Chinese imports of HFC. The 47 lost sales allegations totaled $53.4 million and involved 22.9 million pounds of HFC blends[19], and the 27 lost revenue allegations totaled $63.0 million and involved 41.3 million pounds of HFC blends. HFC blend R-410A accounted for 34 of the 47 lost sales allegations and 17 of the 27 lost revenue allegations.

Staff contacted 20 purchasers and a summary of the information obtained follows (tables V-11 and V-12).

Purchasers responding to the lost sales allegations also were asked whether they shifted their purchases of HFC blends and components from U.S. producers to suppliers of HFC blends and components from China since 2012. In addition, they were asked whether U.S. producers reduced their prices in order to compete with suppliers of HFC blends and components from China. Two of the 20 responding purchasers reported that they had shifted purchases of HFC from U.S. producers to subject imports since 2012; both of these purchasers reported that price was the reason for the shift. Two purchasers reported that U.S. producers had reduced their prices in order to compete with the prices of subject imports since 2012. Responding purchaser *** reported that generally, U.S. producers reduced their prices several times per quarter, with decreases ranging from *** to *** percent.[20]

Table V-11
HFC: U.S. producers' lost sales allegations

* * * * * * *

Table V-12
HFC: U.S. producers' lost revenue allegations

* * * * * * *

[19] U.S. producers did not provide lost sales allegations for HFC components.

[20] *** reported that it did not know if it shifted its purchases of HFC from U.S. producer to subject imports or if U.S. producer had reduced their prices in order to compete with Chinese import prices since 2012. *** indicated that between 80.0 to 90.0 percent of its purchases were from U.S. producers and that maintaining competitive material costs was critical to its operation.

PART VI: FINANCIAL EXPERIENCE OF U.S. PRODUCERS

BACKGROUND

Five U.S. producers reported usable financial results on HFC blends and components: Arkema, Chemours, Honeywell, Hudson, and National.[1] The majority of HFC blends and component revenue represents commercial sales with the remainder classified as transfers.[2] *** accounted for the largest share of total sales volume (***), followed by *** (***), *** (***),*** (***), and *** (***).[3]

As described previously in this report, a majority of the U.S. producers are integrated with respect to the production of at least one primary HFC component.[4] In contrast, National is a non-integrated blender of HFC components. Hudson, a refrigerant gas reclaimer, is also non-integrated ***.

In addition to integration with respect to certain HFC component production, U.S. producers are also in effect integrated pursuant to swap transactions.[5] In general, the cost recognized for swapped material received is the cost of the component given up in the exchange.[6]

With respect to notable changes during the period, DuPont's Performance Chemicals segment was spun-off as a stand-alone business (Chemours) which became a publically traded company at the beginning of July 2015.[7] HFC-related operations were reportedly not impacted

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[1] With the exception of ***, the U.S. industry's financial results were reported for calendar-year periods. Financial results were reported on the basis of generally accepted accounting principles (GAAP).

[2] The Commission requested financial results on the U.S. industry's operations on HFC blends and HFC components. HFC components used to produce HFC blends are reflected in reported cost of goods sold (COGS).

[3] ***. July 22, 2015 e-mail with attachments from *** to USITC auditor.

[4] The integrated producers are all part of publically traded companies. Arkema's HFC operations are part of its Industrial Specialties segment. Arkema 2014 Reference Document, p. 17. Chemours' HFC operations are part of its Fluoroproducts segment. Chemours 2014 information statement, p. 83. Honeywell's HFC operations are ultimately included in its Performance Materials and Technologies segment. Honeywell 2014 10-K, p. 19, pp. 22-23.

[5] Conference transcript, p. 31 (Sassano).

[6] July 21, 2015 e-mail with attachment from *** to USITC auditor. July 21, 2015 e-mail with attachment from *** to USITC auditor. July 21, 2015 e-mail with attachments from *** to USITC auditor.

***. July 21, 2015 e-mail with attachments from *** to USITC auditor. With regard to how these swaps were reported in its financial results, ***. July 21, 2015 e-mail with attachment from *** to USITC auditor.

[7] "In order to reduce the impact of . . . cyclical volatility, which is inherent to the performance chemicals business, on its portfolio, DuPont decided to spin-off the division into a separate company in October last year {2013*}." Shift In Agricultural Sales Timing, Lower Chemical Prices Weigh On DuPont's*

(*continued*...)

by the spin off.[8] While integrated producers all reported that their operations were negatively impacted by reduced market share and sales,[9] ***.[10]

OPERATIONS ON HFC BLENDS AND COMPONENTS

Income and loss data for U.S. producers are presented in table VI-1. A variance analysis of the overall financial results is presented in table VI-2.[11] Table VI-3 presents selected firm data as referenced in this section of the report. A breakout of costs specific to internally-produced HFC components is presented in table VI-4.

Sales volume

While the industry's total sales volume increased during 2012-14, table VI-3 shows that the company-specific pattern of sales volume was not uniform. *** reported increases in sales volume in 2013, while *** reported declines. In 2014 and ***, U.S. producers reported increases in sales volume. The interim period was also mixed with *** reporting higher sales volume in January-March 2015 compared to January-March 2014 and *** reporting lower sales volume.

The directional pattern of company-specific average sales value was generally more uniform than the directional pattern of sales volume. As shown in table VI-3, U.S. producers, for the most part, reported lower average sales values throughout the period. *** which was

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(…*continued*)
Earnings Growth, http://www.forbes.com/sites/greatspeculations/2014/04/24/shift-in-agricultural-sales-timing-lower-chemical-prices-weigh-on-duponts-earnings-growth/, retrieved July 15, 2015.

[8] Conference transcript, p. 89 (Buterbaugh). With regard to DuPont's decision to spin-off the Performance Chemical Division, a Chemours company official noted that ". . . given the market conditions in the flurochemicals industry, particularly in the refrigerant business that we're talking about, clearly had an impact on their decision to evaluate whether to continue to invest . . ." Ibid.

[9] Conference transcript, pp. 35-37 (Sassano), p. 41 (Irani), pp. 44-45 (Clark).

[10] *** U.S. producer questionnaire, response to II-2. ***. July 21, 2015 e-mail with attachment from *** to USITC auditor.

[11] The Commission's variance analysis is calculated in three parts: sales variance, cost of sales variance, and selling, general and administrative (SG&A) expense variance. Each part consists of a price variance (in the case of the sales variance) or a cost or expense variance (in the case of the cost of sales variance and SG&A expense variance), and a volume variance. The sales or cost/expense variance is calculated as the change in unit price or per-unit cost/expense times the new volume, while the volume variance is calculated as the change in volume times the old unit price or per-unit cost/expense. Summarized at the bottom of the table, the price variance is from sales; the cost/expense variance is the sum of those items from the cost of sales and SG&A variances, respectively, and the volume variance is the sum of the volume components of the net sales, cost of sales, and SG&A expense variances.

In general, the utility of the Commission's variance analysis is enhanced when product mix remains the same throughout the period. ***. USITC auditor preliminary-phase notes.

Table VI-1
HFC: Results of operations of U.S. producers, 2012-14, January-March 2014, and January-March 2015

Item	Calendar year			January-March	
	2012	2013	2014	2014	2015
	Quantity (short tons)				
Commercial sales	***	***	***	***	***
Transfers	***	***	***	***	***
Total net sales quantity	75,992	78,211	82,022	21,357	18,920
	Value ($1,000)				
Commercial sales	***	***	***	***	***
Transfers	***	***	***	***	***
Total net sales value	475,733	415,349	402,271	104,261	90,387
Cost of goods sold:					
Cost of internally-produced components[1]	206,981	212,080	210,328	59,786	45,847
Purchased or swapped components (U.S. origin)[2]	107,187	93,643	95,505	22,666	18,969
Purchased components (imported)	38,747	48,860	48,905	9,582	13,437
Direct labor (blending operations only)	9,051	10,079	12,344	2,694	2,719
Other factory costs (blending operations only)	20,513	20,415	20,778	5,168	4,823
Total cost of goods sold	382,479	385,077	387,860	99,896	85,795
Gross profit or (loss)	93,254	30,272	14,411	4,365	4,592
SG&A expenses	38,111	36,730	32,560	9,575	7,089
Operating income or (loss)	55,143	(6,458)	(18,149)	(5,210)	(2,497)
Interest expense	(408)	(702)	(153)	(20)	(75)
Other expenses	748	1,033	894	132	362
Other income items	103	163	135	64	79
Net income or (loss)	54,906	(6,626)	(18,755)	(5,258)	(2,705)
Depreciation/amortization	21,469	21,028	21,280	5,305	5,446
Estimated cash flow	76,375	14,402	2,525	47	2,741
	Ratio to net sales (percent)				
Cost of internally-produced components[1]	43.5	51.1	52.3	57.3	50.7
Purchased or swapped components (U.S. origin)[2]	22.5	22.5	23.7	21.7	21.0
Purchased components (imported)	8.1	11.8	12.2	9.2	14.9
Direct labor (blending operations only)	1.9	2.4	3.1	2.6	3.0
Other factory costs (blending operations only)	4.3	4.9	5.2	5.0	5.3
Cost of goods sold	80.4	92.7	96.4	95.8	94.9
Gross profit or (loss)	19.6	7.3	3.6	4.2	5.1
SG&A expenses	8.0	8.8	8.1	9.2	7.8
Operating income or (loss)	11.6	(1.6)	(4.5)	(5.0)	(2.8)
Net income or (loss)	11.5	(1.6)	(4.7)	(5.0)	(3.0)

Table continued on next page.

Table VI-1--*Continued*
HFC: Results of operations of U.S. producers, 2012-14, January-March 2014, and January-March 2015

Item	Calendar year			January-March	
	2012	2013	2014	2014	2015
	Ratio to cost of goods sold (percent)				
Cost of internally-produced components[1]	54.1	55.1	54.2	59.8	53.4
Purchased or swapped components (U.S. origin)[2]	28.0	24.3	24.6	22.7	22.1
Purchased components (imported)	10.1	12.7	12.6	9.6	15.7
Direct labor (blending operations only)	2.4	2.6	3.2	2.7	3.2
Other factory costs (blending operations only)	5.4	5.3	5.4	5.2	5.6
	Unit values (dollars per short ton)				
Commercial sales	***	***	***	***	***
Transfers	***	***	***	***	***
Total net sales	6,260	5,311	4,904	4,882	4,777
Cost of goods sold:					
Cost of internally-produced components[1]	2,724	2,712	2,564	2,799	2,423
Purchased or swapped components (U.S. origin)[2]	1,411	1,197	1,164	1,061	1,003
Purchased components (imported)	510	625	596	449	710
Direct labor (blending operations only)	119	129	150	126	144
Other factory costs (blending operations only)	270	261	253	242	255
Total cost of goods sold	5,033	4,924	4,729	4,677	4,535
Gross profit or (loss)	1,227	387	176	204	243
SG&A expenses	502	470	397	448	375
Operating income or (loss)	726	(83)	(221)	(244)	(132)
	Number of firms reporting				
Operating losses	0	2	3	3	2
Data	5	4	4	4	4

[1] The costs that make up internally-produced components are presented in table VI-4. The overall average presented in this table is based on total sales volume and does not reconcile directly to the average presented in table VI-4 which is based on the sales volume of integrated producers only.

[2] See footnote 15 regarding purchased or swapped components (U.S. origin).

Source: Compiled from data submitted in response to Commission questionnaires.

Table VI-2
HFC: Variance analysis on the operations of U.S. producers, 2012-14, January-March 2014, and January-March 2015

Item	Calendar year		January-March
	2012-13	2013-14	2014-15
Total net sales:	Value ($1,000)		
Price variance	(74,276)	(33,317)	(1,977)
Volume variance	13,892	20,239	(11,897)
Total net sales variance	(60,384)	(13,078)	(13,874)
Net cost of sales:			
Cost variance	8,571	15,981	2,702
Volume variance	(11,169)	(18,764)	11,399
Total net cost of sales variance	(2,598)	(2,783)	14,101
Gross profit variance	(62,982)	(15,861)	227
SG&A expenses:			
Expense variance	2,494	5,960	1,393
Volume variance	(1,113)	(1,790)	1,093
Total SG&A variance	1,381	4,170	2,486
Operating income variance	(61,601)	(11,691)	2,713
Summarized as:			
Price variance	(74,276)	(33,317)	(1,977)
Net cost/expense variance	11,064	21,940	4,096
Net volume variance	1,610	(315)	595

Source: Compiled from data submitted in response to Commission questionnaires.

Table VI-3
HFC: Results of operations of U.S. producers, by firm, 2012-14, January-March 2014, and January-March 2015

* * * * * * *

Table VI-4
HFC: Cost of internally-produced HFC components, by firm, 2012-14, January-March 2014, and January-March 2015

* * * * * * *

the *** U.S. producer to report a higher average unit sales value in January-March 2015 compared to January-March 2014.[12]

Cost of goods sold

Costs specifically identified as raw material (i.e., the raw material cost included in internally-produced components) plus purchased or swapped components (U.S. origin), and purchased components (imported) ranged from 70.4 percent (2013) to 76.9 percent (2012) of total COGS.[13] As shown in table VI-1, the total cost of internally-produced components, inclusive of related conversion costs (i.e., direct labor and other factory costs), accounted for the largest share of total COGS (ranging from 53.4 percent (January-March 2015) to 59.8 percent (January-March 2014)). Table VI-4 presents a break out of the costs that make up internally-produced components.[14]

As a share of total COGS, purchased or swapped components (U.S. origin) decreased somewhat, while purchased components (imported) increased. Swapped components, as indicated previously, generally reflect the cost of components given up in exchange. As shown in table VI-3, company-specific average costs for purchased or swapped components (U.S. origin) varied. At least in part, this can be attributed to differences in underlying usage rates, as well as the reporting conventions adopted by U.S. producers.[15]

While table VI-1 indicates that internally-produced components, purchased or swapped components (U.S. origin), and purchased components (imported) did not change substantially

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[12] The somewhat higher average unit transfer value in January-March 2015 compared to January-March 2014 (see table VI-1) was due to ***.

[13] USITC auditor preliminary-phase notes. Depending on the HFC components actually produced, as well as integration of the underlying inputs, raw materials vary to some extent by producer: ***. Petitioners' postconference brief, Exhibit 1, p. 5. ***. Petitioners' postconference brief, Exhibit 1, p. 3. ***.

[14] As shown in table VI-4, the cost of internally-produced HFC components is itself comprised of raw materials, direct labor, and other factory costs. On an overall basis, raw materials (ranging from 60.7 percent (2013) to 71.5 percent (2012)) accounted for the largest share of the cost of internally-produced HFC components, followed by other factory costs (ranging from 20.8 percent (2012) to 32.8 percent (2013)), and direct labor (ranging from 5.4 percent (January-March 2015) to 7.6 percent (2012)).

On a company-specific basis the relative share of these costs, as well as their unitized values, were not uniform and followed somewhat different directional trends. ***. When asked to comment on the cost profile calculated from submitted financial information, ***. July 21, 2015 e-mail with attachment from *** to USITC auditor. ***. July 21, 2015 e-mail with attachment from *** to USITC auditor. With regard to its cost structure, ***. July 21, 2015 e-mail with attachments from *** to USITC auditor.

[15] ***. July 21, 2015 e-mail with attachment from *** to USITC auditor. ***. July 21, 2015 e-mail with attachments from *** to USITC auditor. ***. July 21, 2015 e-mail with attachment from *** to USITC auditor.

as a share of total COGS during the period, the underlying company-specific pattern was mixed: ***,[16] ***. In contrast, ***.[17]

***.[18] Consistent with information provided at the staff conference (generally indicating the more capital intensive nature of HFC component production, as opposed to blending operations),[19] average conversion costs specific to internally-produced HFC components (see table VI-4) are substantially greater than average conversion costs for HFC blending (see table VI-3).[20]

Table VI-1 shows that overall average unit COGS declined during 2012-14 and was also somewhat lower in January-March 2015 compared to January-March 2014. In large part, the decline in average COGS during 2012-14 was due to ***.[21] The decline in *** average COGS during 2012-14 reflects a combination of increases and decreases in the cost of internally-produced components combined with lower costs associated with purchased or swapped components (U.S. origin) and purchased components (imported) (see table VI-3). In conjunction with lower sales volume, this pattern reversed in January-March 2015 and *** reported higher average unit COGS which reflects a combination of increased costs (of varying magnitudes) for internally-produced components, purchased or swapped components (U.S. origin), purchased components (imported), and other factory costs (blending operations).[22]

Value added

In general, the Commission estimates "value added" by determining the share of conversion costs (direct labor and other factory costs) to total COGS. Based on the information reported to the Commission and when considered as a group, value added calculated for integrated producers (inclusive of component production and blending operations) ranged from 23.8 percent (2012) to 31.1 percent (2013). With respect to integrated producers' activity specific to blending, value added ranged from 6.9 percent (2012) to 8.7 percent (January-March 2015). As noted previously, National and Hudson are blenders only. Value added for National during 2012-14 ranged from *** percent (2013) to *** percent (2014).[23] Hudson's value added for 2012 (***) was *** percent.[24]

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[16] ***.

[17] Relative cost shares were calculated based on company-specific financial results information. USITC auditor preliminary-phase notes.

[18] Petitioners' postconference brief, Exhibit 1, p. 4.

[19] Conference transcript, pp. 31-32 (Sassano).

[20] Energy inputs were identified as electricity and natural gas. Conference transcript, p. 91 (Irani, Clark). From the perspective of the integrated producers, energy was estimated to represent approximately *** percent of total COGS. Petitioners' postconference brief, Exhibit 1, p. 4.

[21] ***.

[22] ***.

[23] USITC audit preliminary-phase notes. The range of overall value added (i.e., component and blending operations) for the integrated producers was as follows: ***. Ibid. Choices in cost assignment

(*continued*...)

Gross profit or loss

As shown in table VI-3, U.S. producers reported somewhat different directional patterns of gross profitability. *** of the integrated producers reported their highest gross profit ratios at the beginning of the period. ***.[25] ***.[26] ***.[27]

Table VI-3 shows that U.S. producers reported declining average unit sales values throughout 2012-14 and, ***, reported lower average unit sales values in January-March 2015 compared to January-March 2014. While average unit COGS also declined during 2012-14, the relative decline was less than the decline in average unit sales value. This resulted in an increasing COGS-to-sales ratio and a declining gross profit ratio.

SG&A expenses and operating income or loss

Table VI-3 shows that company-specific SG&A ratios (the ratio of total SG&A expenses to revenue) were at somewhat different levels but remained within a relatively narrow range. ***. With regard to similarities and differences in HFC sales and marketing (which could help to explain company-specific differences in SG&A expense ratios), petitioners' postconference brief noted that ***.[28] National reportedly sells a broader range of products, as compared to the integrated producers, and focuses on the aftermarket.[29] In its postconference brief National also stated that it ***.[30]

Overall SG&A expense ratios ranged from 7.8 percent (January-March 2015) to 9.2 percent (January-March 2014) (see table VI-1). While total SG&A expenses declined throughout 2012-14, the increase in the 2013 SG&A expense ratio reflects lower revenue which was only partially offset by a reduction in corresponding SG&A expenses. Given the relative stability of SG&A expense ratios during 2012-14, the general pattern of the industry's profitability was essentially determined at the gross level.

CAPITAL EXPENDITURES AND RESEARCH AND DEVELOPMENT EXPENSES

Table VI-5 presents firm-specific capital expenditures and research and development ("R&D") expenses related to operations on HFC blends and components.

(…*continued*)
appear to explain at least some of the company-specific differences in value added. ***. July 21, 2015 e-mail with attachment from *** to USITC auditor

[24] USITC auditor preliminary-phase notes.

[25] Petitioners' postconference brief, Exhibit 1, p. 2.

[26] Ibid.

[27] National's postconference brief, Exhibit 1, p. 2.

[28] Petitioners' postconference brief, Exhibit 1, p. 3.

[29] Conference transcript, p. 176 (Beatty).

[30] National's postconference brief, Exhibit 1, p. 15. With regard to technical and logistical support, National stated that it ***. Ibid.

Table VI-5
HFC: Capital expenditures and research and development (R&D) expenses U.S. producers, 2012-14, January-March 2014, January-March 2015

Item	Calendar year			January-March	
	2012	2013	2014	2014	2015
Capital expenditures	**Value ($1,000)**				
Arkema	***	***	***	***	***
Chemours	***	***	***	***	***
Honeywell	***	***	***	***	***
Hudson	***	***	***	***	***
National	***	***	***	***	***
Total capital expenditures	14,452	12,061	11,059	2,625	4,363
R&D expenses	**Value ($1,000)**				
Arkema	***	***	***	***	***
Chemours	***	***	***	***	***
Honeywell	***	***	***	***	***
Hudson	***	***	***	***	***
National	***	***	***	***	***
Total R&D expenses	1,061	790	740	190	120

Source: Compiled from data submitted in response to Commission questionnaires.

As shown in table VI-5, the U.S. industry's capital expenditures were at their highest level in 2012 and subsequently declined. *** ***.[31] ***.[32]

*** reported R&D expenses during the period. ***.[33] ***.[34]

ASSETS, INVESTMENT, AND CAPITAL

Table VI-6 presents data on the U.S. producers' property, plant and equipment (PP&E), total assets,[35] asset turnover (sales divided by total assets), and return on assets.

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[31] Integrated producers provided the following narrative descriptions regarding their capital expenditures: ***. Arkema U.S. producer questionnaire, response to III-13b. Chemours U.S. producer questionnaires, response to III-13b. Honeywell U.S. producer questionnaires, response to III-13b.

[32] National stated that its capital expenditures reflect ***. National U.S. producer questionnaire, response to III-13b.

[33] July 21, 2015 e-mail with attachment from *** to USITC auditor.

[34] July 21, 2015 e-mail with attachment from *** to USITC auditor.

[35] With respect to a company's overall operations, staff notes that a total asset value (i.e., the bottom line number on the asset side of a company's balance sheet) reflects an aggregation of a number of assets which are generally not product specific. Accordingly, high-level allocation factors presumably were required in order to report a total asset value for operations on HFC blends and components. As

(*continued*...)

Table VI-6

HFC: U.S. producers' property, plant and equipment (PP&E), total assets, asset turnover, and return on assets, 2012-14

Item	Calendar year		
	2012	2013	2014
PP&E	**Value ($*1,000*)**		
Arkema	***	***	***
Chemours	***	***	***
Honeywell	***	***	***
Hudson	***	***	***
National	***	***	***
Total PP&E	131,078	120,699	109,972
Total assets	**Value ($*1,000*)**		
Arkema	***	***	***
Chemours	***	***	***
Honeywell	***	***	***
Hudson	***	***	***
National	***	***	***
Total assets	290,684	325,420	374,722
Asset turnover	**Net sales to assets (*percent*)**		
Arkema	***	***	***
Chemours	***	***	***
Honeywell	***	***	***
Hudson	***	***	***
National	***	***	***
Total asset turnover	163.7	127.6	107.4
Return on assets	**Operating income (loss) to assets (*percent*)**		
Arkema	***	***	***
Chemours	***	***	***
Honeywell	***	***	***
Hudson	***	***	***
National	***	***	***
Total return on assets	19.0	(2.0)	(4.8)

[1] Not applicable.

Source: Compiled from data submitted in response to Commission questionnaires.

The Commission requested U.S. producers of HFC blends and components to describe any actual or potential negative effects on their return on investment or their growth, investment, ability to raise capital, existing development and production efforts (including

(…*continued*)
such, it should be noted that the pattern of asset values reported can reflect changes in underlying asset account balances, as well as period-to-period variations in relevant allocation factors.

efforts to develop a derivative or more advanced version of the product), or the scale of capital investments as a result of imports of HFC blends and components from China. With regard to experiencing actual negative effects due to subject imports, *** U.S. producers responded "yes" and *** responded "no." Similarly and with regard to anticipated negative effects, *** U.S. producers responded "yes" and *** responded "no."[36] Table VI-7 presents the number of firms reporting an impact in each category of actual negative effects.[37]

Table VI-7
HFC: Negative impact of imports from China

Item	Number of firms
Cancellations, postponement, or rejection of expansion project	***
Denial or rejection of investment proposal	***
Reduction in size of capital investments	***
Rejection of bank loans	***
Lowering of credit rating	***
Problem related to the issue of stocks or bonds	***
Other	***

Source: Compiled from data submitted in response to Commission questionnaires.

[36] As noted by a Chemours company official at the Commission's staff conference, "{a}t the prevailing price levels set by Chinese imports, our profits have fallen year over year over year to the place that in 2014 we couldn't even make a positive profit. These low-priced Chinese imports are driving the low profitability of the HFC blends in the U.S. industry resulting in the shutdown of component facilities and loss of U.S. jobs . . . {i}t's not only impacting us now, but will continue to impact our future ability to invest in next-generation refrigerants as well as our continued investment and presence quite frankly in the U.S. HFC blends and components market." Similarly, an Arkema company official stated that "{o}ur ability to reinvest in the current or next generation of refrigerant products is impaired." Conference transcript, p. 36 (Clark).

[37] U.S. producers' narrative responses regarding actual and anticipated negative effects are presented in app. H.

PART VII: THREAT CONSIDERATIONS AND INFORMATION ON NONSUBJECT COUNTRIES

Section 771(7)(F)(i) of the Act (19 U.S.C. § 1677(7)(F)(i)) provides that—

> *In determining whether an industry in the United States is threatened with material injury by reason of imports (or sales for importation) of the subject merchandise, the Commission shall consider, among other relevant economic factors*[1]*--*
>
> *(I) if a countervailable subsidy is involved, such information as may be presented to it by the administering authority as to the nature of the subsidy (particularly as to whether the countervailable subsidy is a subsidy described in Article 3 or 6.1 of the Subsidies Agreement), and whether imports of the subject merchandise are likely to increase,*
>
> *(II) any existing unused production capacity or imminent, substantial increase in production capacity in the exporting country indicating the likelihood of substantially increased imports of the subject merchandise into the United States, taking into account the availability of other export markets to absorb any additional exports,*
>
> *(III) a significant rate of increase of the volume or market penetration of imports of the subject merchandise indicating the likelihood of substantially increased imports,*
>
> *(IV) whether imports of the subject merchandise are entering at prices that are likely to have a significant depressing or suppressing effect on domestic prices, and are likely to increase demand for further imports,*
>
> *(V) inventories of the subject merchandise,*

---

[1] Section 771(7)(F)(ii) of the Act (19 U.S.C. § 1677(7)(F)(ii)) provides that "The Commission shall consider {these factors} . . . as a whole in making a determination of whether further dumped or subsidized imports are imminent and whether material injury by reason of imports would occur unless an order is issued or a suspension agreement is accepted under this title. The presence or absence of any factor which the Commission is required to consider . . . shall not necessarily give decisive guidance with respect to the determination. Such a determination may not be made on the basis of mere conjecture or supposition."

(VI) the potential for product-shifting if production facilities in the foreign country, which can be used to produce the subject merchandise, are currently being used to produce other products,

(VII) in any investigation under this title which involves imports of both a raw agricultural product (within the meaning of paragraph (4)(E)(iv)) and any product processed from such raw agricultural product, the likelihood that there will be increased imports, by reason of product shifting, if there is an affirmative determination by the Commission under section 705(b)(1) or 735(b)(1) with respect to either the raw agricultural product or the processed agricultural product (but not both),

(VIII) the actual and potential negative effects on the existing development and production efforts of the domestic industry, including efforts to develop a derivative or more advanced version of the domestic like product, and

(IX) any other demonstrable adverse trends that indicate the probability that there is likely to be material injury by reason of imports (or sale for importation) of the subject merchandise (whether or not it is actually being imported at the time).[2]

Information on the volume and pricing of imports of the subject merchandise is presented in *Parts IV* and *V*; and information on the effects of imports of the subject merchandise on U.S. producers' existing development and production efforts is presented in *Part VI*. Information on inventories of the subject merchandise; foreign producers' operations, including the potential for "product-shifting;" any other threat indicators, if applicable; and any dumping in third-country markets, follows.[3] Also presented in this section of the report is information obtained for consideration by the Commission on nonsubject countries.

[2] Section 771(7)(F)(iii) of the Act (19 U.S.C. § 1677(7)(F)(iii)) further provides that, in antidumping investigations, ". . . the Commission shall consider whether dumping in the markets of foreign countries (as evidenced by dumping findings or antidumping remedies in other WTO member markets against the same class or kind of merchandise manufactured or exported by the same party as under investigation) suggests a threat of material injury to the domestic industry."

[3] Data for HFC components and blends in China include the nonsubject component, R-134a.

THE INDUSTRY IN CHINA

The Commission issued foreign producers' or exporters' questionnaires to approximately 50 firms believed to produce and/or export HFC from China.[4] Useable responses to the Commission's questionnaire were received from thirteen firms: Arkema Daikin; Huantai Dongyue International Trade Co., Ltd. ("Huantai Dongyue"); Sinochem Lantian Trading Co., Ltd. ("Sinochem Lantian"); Weitron Kunshan; Zhejiang Juhua Co., Ltd. ("Zhejiang Juhua"); Zhejiang Quzhou Juxin; Zhejiang Quzhou Lianzhou; Sinochem Taicang; Zhejiang Lantian; Shandong Dongyue; Zhejiang Sanmei; Jinhua Yonghe; and Zhejiang Yonghe.[5] Chinese producers and exporters total reported exports to the United States accounted for approximately one quarter (25 percent) of official U.S. import statistics. This number likely understates coverage as both HTS numbers used for official U.S. import statistics are basket categories. Comparing foreign producer questionnaire data on reported exports to importer questionnaire data on reported imports, responding Chinese producers and exporters total reported exports accounting for approximately two thirds (66 percent) of reported imports.[6] Of all the responding HFC producers/exporters in China, *** is the largest producer of HFC components and *** is the largest producer of HFC blends in China. Table VII- 1 presents information on the HFC operations of the responding producers and exporters in China.

[4] These firms were identified through a review of information submitted in the petition and contained in proprietary Customs records.

[5] Two responding Chinese firms, ***, are exporters of HFC and did not report production of HFC from 2012 to March 2014.

[6] Ten Chinese producers responded and estimated that they make up approximately 79 percent of total HFC exports to the United States in 2014.

Table VII-1
HFC: Summary data on firms in China, January 2012 through March 2015

Firm	Production (short tons)	Share of reported production (percent)	Exports to the United States (short tons)	Share of reported exports to the United States (percent)	Total shipments (short tons)	Share of firm's total shipments exported to the United States (percent)
HFC components:						
Arkema Daikin Changsu	***	***	***	***	***	***
Huantai Dongyue	***	***	***	***	***	([1])
Jinhua Yonghe	***	***	***	***	***	***
Shandong Dongyue	***	***	***	***	***	***
Sinochem Taicang	***	***	***	***	***	***
Sinochem Lantian	***	***	***	***	***	([1])
Weitron Kunshan	***	***	***	***	***	([1])
Zhejiang Juhua	***	***	***	***	***	***
Zhejiang Lantian	***	***	***	***	***	***
Zhejiang Quzhou Juxin	***	***	***	***	***	***
Zhejiang Quzhou Lianzhou	***	***	***	***	***	([1])
Zhejiang Sanmei	***	***	***	***	***	***
Zhejiang Yonghe	***	***	***	***	***	([1])
Total	***	***	***	***	***	***
HFC blends:						
Arkema Daikin Changsu	***	***	***	***	***	***
Huantai Dongyue	***	***	***	***	***	([1])
Jinhua Yonghe	***	***	***	***	***	([1])
Shandong Dongyue	***	***	***	***	***	***
Sinochem Taicang	***	***	***	***	***	***
Sinochem Lantian	***	***	***	***	***	([1])
Weitron Kunshan	***	***	***	***	***	***
Zhejiang Juhua	***	***	***	***	***	([1])
Zhejiang Lantian	***	***	***	***	***	***
Zhejiang Quzhou Juxin	***	***	***	***	***	([1])
Zhejiang Quzhou Lianzhou	***	***	***	***	***	***
Zhejiang Sanmei	***	***	***	***	***	***
Zhejiang Yonghe	***	***	***	***	***	***
Total	***	***	***	***	***	***

[1] Share not calculated for a firm if firm was not actual producer of the goods.

Note.--Adjustments were made for firms that were exporters but not producers of the subject merchandise to eliminate the double counting of data in the industry when data were combined. Data for HFC components include the nonsubject production of R-134a.

Source: Compiled from data submitted in response to Commission questionnaires.

Table VII-2 presents information on responding Chinese producers' changes in HFC operations from 2012 to March 2015. Since 2012, Chinese producers have started one new R-32 plant, four new R-125 plants, one new R-143a plant, and one new R-410A blending facility.[7] Five Chinese producers of HFC have also reported capacity expansions from 2012 to March 2015. Only one Chinese producer of HFC (***) reported a shutdown of a HFC component plant (R-32) and a reduction of HFC blending operation for R-410A since 2012.

Table VII-2
HFC: Chinese producers' reported changes in operations, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

Table VII-3 presents data on Chinese producers' overall capacity and production of subject HFC components and blends using the same equipment as nonsubject products. Eight out of 13 Chinese HFC producers reported producing HFC components and blends, and two Chinese HFC producers reported producing nonsubject R-134a. HFC producers and blenders in China reported that HFC production for both blends and components was the primary use for this equipment, ranging from 94.6 percent to 97.8 percent of total production.

[7] Respondent for Chinese producers contend that the reason China increased production of HFC blends is because "many patents for HFC blends, including R-410A, R-407A expired, lowering production costs of HFC." Postconference brief, p. 126 (Marshak). Further details on patent expiration are available in Chinese respondents' posthearing brief, p. 15.

Table VII-3

HFC: Chinese producers' overall capacity and production on the same equipment as subject production, 2012-14, January to March 2014, and January to March 2015

Item	Calendar year			January to March	
	2012	2013	2014	2014	2015
	Quantity (short tons)				
Overall capacity HFC component machinery	85,198	122,609	149,397	35,177	42,133
Production:					
HFC components	58,995	93,903	122,933	25,902	34,378
Other products[1]	0	0	0	0	0
Total production	58,995	93,903	122,933	25,902	34,378
	Ratios and shares (percent)				
Capacity utilization	69.2	76.6	82.3	73.6	81.6
Share of production:					
HFC components	100.0	100.0	100.0	100.0	100.0
Other products[1]	0.0	0.0	0.0	0.0	0.0
Total production	100.0	100.0	100.0	100.0	100.0
	Quantity (short tons)				
Overall capacity HFC blends machinery	126,448	141,848	169,268	43,250	43,250
Production:					
HFC blends	51,072	78,523	115,524	23,801	28,688
Other products	2,935	2,440	2,607	1,100	1,066
Total production	54,007	80,963	118,131	24,901	29,754
	Ratios and shares (percent)				
Capacity utilization	42.7	57.1	69.8	57.6	68.8
Share of production:					
HFC blends	94.6	97.0	97.8	95.6	96.4
Other products	5.4	3.0	2.2	4.4	3.6
Total production	100.0	100.0	100.0	100.0	100.0

Note.—Data for Chinese producers include production of nonsubject HFC component, R-134a.

Source: Compiled from data submitted in response to Commission questionnaires.

Table VII-4 presents data on the HFC component industry in China, including data for nonsubject HFC component R-134a. Capacity and production both increased from 2012 to 2014 for producers of HFC components in China. Shipments to all markets increased from 2012 to 2014, with shipments to the United States increasing nearly sevenfold, from *** short tons in 2012 to *** short tons in 2014. For Chinese HFC component producers, HFC component production were internally consumed to produce HFC blends for the period 2012-14, ***. Table VII-2 provided information on a number of new HFC plants in China coming online as well as several HFC production increases from 2012 to 2014 which may explain these increases in capacity, production, and shipments in China of HFC components.

Table VII-4
HFC: Data on component industry in China, 2012-14, January to March 2014, and January to March 2015 and projection calendar years 2014 and 2015

Item	Actual experience					Projections	
	Calendar year			January to March		Calendar year	
	2012	2013	2014	2014	2015	2015	2016
	Quantity (short tons)						
Capacity	85,198	122,609	149,397	35,177	42,133	168,531	168,531
Production	58,995	93,903	122,933	25,902	34,378	139,741	139,741
End-of-period inventories	4,887	5,776	7,918	6,395	7,922	8,800	8,609
Shipments:							
Home market shipments:							
Internal consumption for making blends	***	***	***	***	***	***	***
IC/Transfer other than making blends	***	***	***	***	***	***	***
Home market shipments	***	***	***	***	***	***	***
Subtotal, home market shipments	69,781	99,281	120,342	25,399	28,535	121,287	125,923
Export shipments to:							
United States	***	***	***	***	***	***	***
All other markets	***	***	***	***	***	***	***
Total exports	***	***	***	***	***	***	***
Total shipments	77,872	119,956	147,330	29,522	38,003	151,063	154,565
	Ratios and shares (percent)						
Capacity utilization	69.2	76.6	82.3	73.6	81.6	82.9	82.9
Inventories/production	8.3	6.2	6.4	6.2	5.8	6.3	6.2
Inventories/total shipments	6.3	4.8	5.4	5.4	5.2	5.8	5.6
Share of shipments:							
Home market shipments:							
Internal consumption for making blends	***	***	***	***	***	***	***
IC/Transfer other than making blends	***	***	***	***	***	***	***
Home market shipments	***	***	***	***	***	***	***
Subtotal, home market shipments	***	***	***	***	***	***	***
Export shipments to:							
United States	***	***	***	***	***	***	***
All other markets	***	***	***	***	***	***	***
Total exports	***	***	***	***	***	***	***
Total shipments	***	***	***	***	***	***	***

Note.—Data for Chinese producers include production of nonsubject HFC component, R-134a.

Source: Compiled from data submitted in response to Commission questionnaires.

Table VII-5 presents data on China's top destinations for exports of HFC components from 2009 to 2014. In both quantity and value, United States was China's top destination over this period, with the quantity of China's export to the United States more than doubling from 2009 to 2012 and 2013, but declining somewhat from 2013 to 2014. In terms of value, China's exports to the United States increased exponentially from 2009 to a peak in 2011 before declining somewhat from 2012 to 2014. In terms of unit value, China's exports of HFC components to countries other than the United States were consistently higher than China's exports to the United States from 2009 to 2014.

Table VII-5
HFC: China's top export destinations of components, 2009-2014

Export destination	Calendar year					
	2009	2010	2011	2012	2013	2014
	Quantity (short tons)					
United States	23,469	43,034	48,204	50,853	57,066	42,129
Netherlands	9,351	15,162	15,500	11,817	12,388	17,942
Japan	9,168	15,011	17,595	16,251	14,733	16,613
Korea South	4,805	7,502	7,216	10,965	11,466	11,694
Brazil	3,955	3,661	6,811	5,415	5,988	8,313
Taiwan	2,942	3,752	5,122	7,168	7,014	7,424
United Kingdom	4,404	7,786	8,143	7,427	7,424	6,930
Italy	4,634	6,961	7,029	6,839	5,356	6,840
Germany	839	2,929	3,298	3,492	4,346	5,878
All other countries	42,727	52,622	64,473	74,578	69,152	79,559
China's world exports of components	106,297	158,413	183,392	194,802	194,932	203,324

Table continued on next page.

Table VII-5--*Continued*

HFC: China's top export destinations of components, 2009-2014

Export destination	Calendar year					
	2009	2010	2011	2012	2013	2014
	Value ($1,000)					
United States	52,764	139,559	302,001	227,140	184,244	135,733
Netherlands	26,833	65,373	126,685	66,453	45,121	60,349
Japan	36,382	79,178	171,145	88,312	61,079	62,221
Korea South	14,732	36,434	51,484	45,347	38,556	37,458
Brazil	13,976	17,445	44,902	21,738	18,992	21,790
Taiwan	9,165	16,905	35,101	28,412	21,495	21,779
United Kingdom	13,227	30,474	48,726	29,465	24,255	20,819
Italy	13,808	32,724	56,458	30,362	15,402	17,338
Germany	4,055	16,396	29,354	15,827	13,304	15,143
All other countries	137,908	246,391	442,148	336,513	238,014	237,866
China's world exports of components	322,849	680,878	1,308,003	889,569	660,462	630,495
	Unit value (dollars per short ton)					
United States	2,248	3,243	6,265	4,467	3,229	3,222
Netherlands	2,870	4,312	8,173	5,624	3,642	3,363
Japan	3,968	5,275	9,727	5,434	4,146	3,745
Korea South	3,066	4,856	7,135	4,136	3,363	3,203
Brazil	3,534	4,765	6,592	4,015	3,172	2,621
Taiwan	3,115	4,505	6,852	3,964	3,065	2,934
United Kingdom	3,004	3,914	5,984	3,967	3,267	3,004
Italy	2,980	4,701	8,032	4,440	2,876	2,535
Germany	4,834	5,598	8,900	4,532	3,061	2,576
All other countries	3,228	4,682	6,858	4,512	3,442	2,990
China's world exports of components	3,037	4,298	7,132	4,567	3,388	3,101
	Share of exports (percent)					
United States	22.1	27.2	26.3	26.1	29.3	20.7
Netherlands	8.8	9.6	8.5	6.1	6.4	8.8
Japan	8.6	9.5	9.6	8.3	7.6	8.2
Korea South	4.5	4.7	3.9	5.6	5.9	5.8
Brazil	3.7	2.3	3.7	2.8	3.1	4.1
Taiwan	2.8	2.4	2.8	3.7	3.6	3.7
United Kingdom	4.1	4.9	4.4	3.8	3.8	3.4
Italy	4.4	4.4	3.8	3.5	2.7	3.4
Germany	0.8	1.8	1.8	1.8	2.2	2.9
All other countries	40.2	33.2	35.2	38.3	35.5	39.1
China's world exports of components	100.0	100.0	100.0	100.0	100.0	100.0

Note.-- The data presented in this table are likely overstated. The subject products constitute only a portion of this basket category at the 6-digit level.

Source: Global Trade Atlas, accessed July 24, 2015 for HTS 2903.39.

Table VII-6 presents data on the HFC blends industry in China. Capacity and production both increased from 2012 to 2014 for producers of HFC blends in China. Shipments to all markets more than doubled from 2012 to 2014, with shipments to the United States almost quadrupling, from *** short tons in 2012 to *** short tons in 2014. Table VII-2 provided information on a number of new HFC plants in China coming online as well as several HFC capacity increases from 2012 to 2014 which may explain Chinese industry's increased capacity, production, and shipments of HFC blends.

Table VII-6
HFC: Data on blends industry in China, 2012-14, January to March 2014, and January to March 2015 and projection calendar years 2014 and 2015

Item	Actual experience					Projections	
	Calendar year			January to March		Calendar year	
	2012	2013	2014	2014	2015	2015	2016
	Quantity (short tons)						
Capacity	127,448	142,848	215,268	43,200	43,200	170,268	170,268
Production	51,072	78,523	115,524	23,801	28,688	125,220	125,708
End-of-period inventories	2,599	4,936	6,079	6,433	6,678	5,495	5,003
Shipments:							
Home market shipments:							
Internal consumption/ transfers	***	***	***	***	***	***	***
Home market shipments	***	***	***	***	***	***	***
Subtotal, home market shipments	36,339	53,829	84,392	17,957	19,806	86,258	87,481
Export shipments to:							
United States	***	***	***	***	***	***	***
All other markets	***	***	***	***	***	***	***
Total exports	18,400	32,006	53,216	8,109	14,596	58,535	59,215
Total shipments	54,739	85,835	137,608	26,066	34,402	144,793	146,696
	Ratios and shares (percent)						
Capacity utilization	40.1	55.0	53.7	55.1	66.4	73.5	73.8
Inventories/production	5.1	6.3	5.3	6.8	5.8	4.4	4.0
Inventories/total shipments	4.7	5.8	4.4	6.2	4.9	3.8	3.4
Share of shipments:							
Home market shipments:							
Internal consumption/ transfers	***	***	***	***	***	***	***
Home market shipments	***	***	***	***	***	***	***
Subtotal, home market shipments	***	***	***	***	***	***	***
Export shipments to:							
United States	***	***	***	***	***	***	***
All other markets	***	***	***	***	***	***	***
Total exports	***	***	***	***	***	***	***
Total shipments	***	***	***	***	***	***	***

Source: Compiled from data submitted in response to Commission questionnaires.

Table VII-7 presents data on China's top destinations for exports of HFC blends from 2009 to 2014. In both quantity and value, the United States went from one of the smallest markets for Chinese HFC blends in 2009 to being the top destination for Chinese HFC blend in 2014. Overall, China increased its exports of HFC blends to the world from 2009 to 2014, increasing by more than threefold in quantity and by 257 percent in value. In terms of unit value, China's exports of HFC components to countries other than the United States were higher than China's exports to the United States from 2009 to 2011, but lower in 2012 to 2014.

Table VII-7
HFC: China's top export destinations of blends, 2009-2014

Export destination	Calendar year					
	2009	2010	2011	2012	2013	2014
	Quantity (short tons)					
United States	95	984	1,679	5,905	8,693	12,690
Thailand	2,982	5,132	6,402	5,117	6,364	8,208
Japan	2,975	4,190	4,977	4,572	6,499	7,252
Russia	1,743	3,260	3,882	3,990	5,033	6,036
Korea South	2,124	3,441	3,854	3,681	4,109	5,599
Italy	384	984	800	2,251	2,431	4,672
Brazil	421	916	1,124	1,491	2,239	3,577
Spain	446	736	675	1,588	3,781	3,339
United Kingdom	44	330	491	1,055	1,258	3,142
All other countries	11,681	14,847	17,940	29,887	28,781	40,062
China's world exports of blends	22,888	34,820	41,824	59,540	69,193	94,574
	Value ($1,000)					
United States	615	7,032	13,935	23,645	26,784	34,964
Thailand	9,917	22,421	55,800	21,312	17,669	20,145
Japan	16,768	22,023	48,038	35,701	35,329	33,601
Russia	5,995	17,712	32,284	17,513	16,938	19,224
Korea South	7,852	16,130	31,981	14,190	12,685	16,242
Italy	1,146	4,590	6,705	9,077	7,255	13,063
Brazil	1,414	4,516	8,561	7,114	8,422	13,412
Spain	1,394	3,754	5,278	6,210	11,225	9,310
United Kingdom	158	1,889	3,250	4,033	3,728	9,024
All other countries	36,446	67,264	138,987	131,440	94,902	122,615
China's world exports of blends	81,705	167,331	344,819	270,234	234,937	291,600

Table continued on next page.

Table VII-7--*Continued*
HFC: China's top export destinations of blends, 2009-2014

Export destination	Calendar year					
	2009	2010	2011	2012	2013	2014
	Unit value (dollars per short ton)					
United States	6,491	7,144	8,301	4,004	3,081	2,755
Thailand	3,326	4,368	8,716	4,165	2,777	2,454
Japan	5,636	5,256	9,652	7,808	5,436	4,633
Russia	3,440	5,434	8,316	4,389	3,365	3,185
Korea South	3,697	4,687	8,299	3,855	3,087	2,901
Italy	2,987	4,663	8,378	4,033	2,985	2,796
Brazil	3,358	4,930	7,614	4,770	3,762	3,749
Spain	3,123	5,099	7,823	3,910	2,969	2,788
United Kingdom	3,574	5,733	6,625	3,823	2,964	2,872
All other countries	3,120	4,530	7,747	4,398	3,297	3,061
China's world exports of blends	3,570	4,806	8,245	4,539	3,395	3,083
	Share of exports (percent)					
United States	0.4	2.8	4.0	9.9	12.6	13.4
Thailand	13.0	14.7	15.3	8.6	9.2	8.7
Japan	13.0	12.0	11.9	7.7	9.4	7.7
Russia	7.6	9.4	9.3	6.7	7.3	6.4
Korea South	9.3	9.9	9.2	6.2	5.9	5.9
Italy	1.7	2.8	1.9	3.8	3.5	4.9
Brazil	1.8	2.6	2.7	2.5	3.2	3.8
Spain	2.0	2.1	1.6	2.7	5.5	3.5
United Kingdom	0.2	0.9	1.2	1.8	1.8	3.3
All other countries	51.0	42.6	42.9	50.2	41.6	42.4
China's world exports of blends	100.0	100.0	100.0	100.0	100.0	100.0

Note.-- The data presented in this table are likely overstated. The subject products constitute only a portion of this basket category at the 6-digit level.

Source: Global Trade Atlas, accessed July 24, 2015 for HTS 3824.78.

U.S. INVENTORIES OF IMPORTED MERCHANDISE

Tables VII-8 and VII-9 present data on U.S. importers' reported inventories of HFC components and blends, respectively. From 2012 to March 2015, U.S. importers' reported inventories of HFC components were higher than reported inventories of HFC blends.

Table VII-8
HFC: U.S. importers' end-of-period component inventories of imports by source, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

Table VII-9
HFC: U.S. importers' end-of-period blend inventories of imports by source, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

U.S. IMPORTERS' OUTSTANDING ORDERS

The Commission requested importers to indicate whether they imported or arranged for the importation of HFC from China after March 31, 2015. Table VII-10 presents U.S. importers' responses on their outstanding orders of HFC. Twelve out of fourteen responding U.S. importers of HFC components and blends indicated that they imported or arranged for importation of HFC from China after March 31, 2015.[8] Virtually all orders (*** percent) after March 31, 2015 are orders of HFC from China.

Table VII-10
HFC: U.S. importers' outstanding orders

* * * * * * *

ANTIDUMPING OR COUNTERVAILING DUTY ORDERS IN THIRD-COUNTRY MARKETS

All thirteen responding U.S. importers of HFC and all thirteen responding Chinese producers/exporters of HFC reported that there are no antidumping duty orders on HFC blends or components in third-country markets. However, the European Union ("EU") has placed a non-tariff barrier on HFCs with the goal of reducing emissions of fluorinated greenhouse gasses.[9]

INFORMATION ON NONSUBJECT COUNTRIES

In assessing whether the domestic industry is materially injured or threatened with material injury "by reason of subject imports," the legislative history states "that the Commission must examine all relevant evidence, including any known factors, other than the dumped or subsidized imports, that may be injuring the domestic industry, and that the Commission must examine those other factors (including non-subject imports) 'to ensure that it is not attributing injury from other sources to the subject imports.'"[10]

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[8] Two firms, (***), indicated that they did not import or arrange for importation of HFC from China after March 31, 2015.

[9] *REGULATION (EU) No 517/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 April 2014 on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006.* Retrieved from http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0517&qid=1437675187485&from=EN on July 23, 2015.

[10] *Mittal Steel Point Lisas Ltd. v. United States*, Slip Op. 2007-1552 at 17 (Fed. Cir. Sept. 18, 2008), quoting from Statement of Administrative Action on Uruguay Round Agreements Act, H.R. Rep. 103-316, Vol. I at 851-52; *see also Bratsk Aluminum Smelter v. United States*, 444 F.3d 1369 (Fed. Cir. 2006).

Tables VII-11 and VII-12 present data on world exports of HFC components and blends, respectively.

Table VII-11
HFC: World exports of components, 2009-2014

Exporting country	Calendar year					
	2009	2010	2011	2012	2013	2014
	Quantity (short tons)					
China	106,297	158,413	183,392	194,802	194,932	203,324
USA	76,005	87,927	85,033	89,140	91,028	90,211
EU28 (External Trade)	16,432	22,278	23,748	24,511	26,004	27,236
Japan	18,998	16,979	20,106	15,741	11,638	10,035
Singapore	4,306	3,525	3,017	2,970	3,342	2,896
Mexico	1,151	1,233	1,360	1,358	1,306	1,860
India	188	53	1,042	608	594	1,030
Malaysia	429	793	459	220	613	759
Turkey	150	157	114	132	262	547
All other countries	4,134	4,381	6,693	6,296	6,658	2,154
All exporting countries	228,090	295,738	324,964	335,778	336,377	340,051
	Value ($1,000)					
China	322,849	680,878	1,308,003	889,569	660,462	630,495
USA	333,067	400,092	525,215	574,152	625,070	494,012
EU28 (External Trade)	100,014	149,329	209,852	198,979	189,050	195,939
Japan	139,003	188,718	254,480	196,572	147,697	151,692
Singapore	15,980	19,680	30,637	18,543	22,196	18,856
Mexico	6,038	7,638	10,867	10,162	8,601	10,047
India	1,270	848	9,530	6,063	6,537	9,199
Malaysia	1,391	2,945	3,397	1,275	2,546	2,743
Turkey	775	1,283	1,458	1,019	1,349	2,408
All other countries	35,407	37,597	73,165	49,223	56,039	36,594
All exporting countries	955,795	1,489,009	2,426,604	1,945,555	1,719,546	1,551,985

Table continued on next page.

Table VII-11--*Continued*

HFC: World exports of components, 2009-2014

Exporting country	Calendar year					
	2009	2010	2011	2012	2013	2014
	Unit value (dollars per short ton)					
China	3,037	4,298	7,132	4,567	3,388	3,101
USA	4,382	4,550	6,177	6,441	6,867	5,476
EU28 (External Trade)	6,086	6,703	8,837	8,118	7,270	7,194
Japan	7,317	11,115	12,657	12,488	12,691	15,116
Singapore	3,711	5,583	10,155	6,244	6,641	6,512
Mexico	5,247	6,192	7,989	7,482	6,584	5,403
India	6,738	16,029	9,149	9,963	11,003	8,935
Malaysia	3,245	3,716	7,407	5,783	4,154	3,612
Turkey	5,170	8,199	12,845	7,700	5,144	4,404
All other countries	8,565	8,583	10,931	7,818	8,417	16,989
All exporting countries	4,190	5,035	7,467	5,794	5,112	4,564
	Share of exports (percent)					
China	46.6	53.6	56.4	58.0	58.0	59.8
USA	33.3	29.7	26.2	26.5	27.1	26.5
EU28 (External Trade)	7.2	7.5	7.3	7.3	7.7	8.0
Japan	8.3	5.7	6.2	4.7	3.5	3.0
Singapore	1.9	1.2	0.9	0.9	1.0	0.9
Mexico	0.5	0.4	0.4	0.4	0.4	0.5
India	0.1	0.0	0.3	0.2	0.2	0.3
Malaysia	0.2	0.3	0.1	0.1	0.2	0.2
Turkey	0.1	0.1	0.0	0.0	0.1	0.2
All other countries	1.8	1.5	2.1	1.9	2.0	0.6
All exporting countries	100.0	100.0	100.0	100.0	100.0	100.0

Note.-- The data presented in this table are likely overstated. The subject products constitute only a portion of this basket category at the 6-digit level.

Source: Global Trade Atlas, accessed July 24, 2015. HTS 2903.39.

Table VII-12

HFC: World exports of blends, 2009-2014

Exporting country	Calendar year					
	2009	2010	2011	2012	2013	2014
	Quantity (short tons)					
China	22,888	34,820	41,824	59,540	69,193	94,574
USA	1,787	5,393	7,325	11,371	13,636	17,143
EU28 (External Trade)	3,999	6,471	7,033	5,914	6,962	7,807
Taiwan	0	0	0	1,367	3,727	3,482
Singapore	42	20	165	955	901	1,056
Malaysia	23	129	4	140	230	578
South Korea	564	930	1,117	783	723	502
Mexico	259	230	195	99	366	432
India	1	1	146	117	211	413
All other countries	345	342	492	554	700	981
All exporting countries	29,909	48,335	58,300	80,840	96,648	126,968
	Value ($1,000)					
China	81,705	167,331	344,819	270,234	234,937	291,600
USA	16,305	39,414	60,226	82,086	79,909	88,263
EU28 (External Trade)	21,691	39,614	60,380	36,497	39,997	44,142
Taiwan	0	0	0	8,848	13,204	11,260
Singapore	194	112	1,675	5,406	4,218	4,235
Malaysia	167	442	25	662	998	2,017
South Korea	653	547	1,548	576	416	467
Mexico	1,364	1,633	1,474	778	2,881	3,162
India	2	2	219	37	117	622
All other countries	1,809	2,259	5,517	3,739	4,100	5,266
All exporting countries	123,890	251,354	475,884	408,862	380,778	451,033

Table continued on next page.

Table VII-12--*Continued*

HFC: World exports of blends, 2009-2014

Exporting country	Calendar year					
	2009	2010	2011	2012	2013	2014
	Unit value (dollars per short ton)					
China	3,570	4,806	8,245	4,539	3,395	3,083
USA	9,125	7,309	8,222	7,219	5,860	5,149
EU28 (External Trade)	5,424	6,122	8,586	6,171	5,745	5,655
Taiwan	fn1	fn1	fn1	6,473	3,543	3,234
Singapore	4,625	5,646	10,133	5,663	4,684	4,010
Malaysia	7,215	3,429	5,665	4,731	4,334	3,492
South Korea	1,157	587	1,387	735	575	931
Mexico	5,265	7,089	7,555	7,843	7,874	7,318
India	1,633	1,581	1,503	318	555	1,504
All other countries	5,243	6,611	11,222	6,743	5,857	5,368
All exporting countries	4,142	5,200	8,163	5,058	3,940	3,552
	Share of exports (percent)					
China	76.5	72.0	71.7	73.7	71.6	74.5
USA	6.0	11.2	12.6	14.1	14.1	13.5
EU28 (External Trade)	13.4	13.4	12.1	7.3	7.2	6.1
Taiwan	0.0	0.0	0.0	1.7	3.9	2.7
Singapore	0.1	0.0	0.3	1.2	0.9	0.8
Malaysia	0.1	0.3	0.0	0.2	0.2	0.5
South Korea	1.9	1.9	1.9	1.0	0.7	0.4
Mexico	0.9	0.5	0.3	0.1	0.4	0.3
India	0.0	0.0	0.2	0.1	0.2	0.3
All other countries	1.2	0.7	0.8	0.7	0.7	0.8
All exporting countries	100.0	100.0	100.0	100.0	100.0	100.0

Note.-- The data presented in this table are likely overstated. The subject products constitute only a portion of this basket category at the 6-digit level.

Source: Global Trade Atlas, accessed July 24, 2015. HTS 3824.78.

The production of HFC components is concentrated in a few countries. Since blending is a less capital-intensive activity, that portion of the industry is not tracked as closely. Therefore, the following discussion is based on data regarding HFC components.

China and the United States dominate the global HFC industry, combining for a total of *** percent of subject component capacity in 2013 and at least *** percent of subject component production in 2012. Nonsubject producers in Western Europe and Japan accounted for the balance of the subject HFC industry.[11]

The production figures for Western Europe are aggregated for all HFCs, including nonsubject components such as R-134a, so the subject component production is less than the

[11] ***.

number used in these discussions. More specific details are available for capacity at the different facilities. Therefore, while Western Europe's aggregated HFC production (including nonsubject components) represented *** percent of global production of the subject components while its 2013 capacity for the subject components represented only about *** percent of the global total capacity for the subject components. [12]

Western Europe's 2013 capacity for *** was *** percent of the global total capacity for each of those components. With regard to ***, the 2013 European capacity represented *** percent of global total capacity for that HFC component. Western Europe's capacity for R-134a, a nonsubject component, was greater than its capacity for all three of the subject components combined in 2013. [13]

Western European exports of all HFC components, both subject and nonsubject, were aggregated. The primary exports markets for these HFCs were the Middle East, northern Africa, Asia, and the United States. [14]

Insofar as the Japanese HFC industry is concerned, its primary focus is on the production of R-134a. Japanese production of subject HFC components was at least *** percent of the global total in 2012. Japanese exports of the subject components in 2013 were quite limited and were generally shipped to other Asian destinations. Beyond HFCs, the Japanese fluorocarbon industry produces HCFCs as precursors for polymers.[15]

[12] ***.
[13] ***.
[14] ***.
[15] ***.

APPENDIX A

FEDERAL REGISTER NOTICES

The Commission makes available notices relevant to its investigations and reviews on its website, www.usitc.gov. In addition, the following tabulation presents, in chronological order, *Federal Register* notices issued by the Commission and Commerce during the current proceeding.

Citation	Title	Link
80 FR 38231 July 2, 2015	*Hydrofluorocarbon Blends and Components from China; Institution of Antidumping Duty Investigation and Scheduling of Preliminary Phase Investigation*	http://www.gpo.gov/fdsys/pkg/FR-2015-07-02/pdf/2015-16368.pdf
80 FR 43387 July 22, 2015	*Hydrofluorocarbon Blends and Components Thereof From the People's Republic of China: Initiation of Less-Than-Fair-Value Investigation*	http://www.gpo.gov/fdsys/pkg/FR-2015-07-22/pdf/2015-17984.pdf

APPENDIX B

CONFERENCE WITNESSES

CALENDAR OF PUBLIC PRELIMINARY CONFERENCE

Those listed below appeared as witnesses at the United States International Trade Commission's preliminary conference:

Subject: Hydrofluorocarbon Blends and Components from China

Inv. No.: 731-TA-1279 (Preliminary)

Date and Time: July 16, 2015 - 9:30 a.m.

Sessions were held in connection with this preliminary investigation in the Main Hearing Room (Room 101), 500 E Street, S.W., Washington, D.C.

OPENING REMARKS:

Petitioner (**James R. Cannon, Jr.**, Cassidy Levy Kent (USA) LLP)
Respondents (**Ned H. Marshak**, Grunfeld Desiderio Lebowitz Silverman & Klestadt LLP *and* **Jarrod M. Goldfeder**, Trade Pacific PLLC)

In Support of the Imposition of Antidumping Duty Order:

Cassidy Levy Kent (USA) LLP
Washington, DC
on behalf of

The American HFC Coalition

Alison Clark, Global Business Director, Arkema Inc.

Glen Haun, Director of Sales, Arkema Inc.

Richard Hudock, Assistant General Counsel, Arkema Inc.

Elizabeth Mary Sassano, Global Business and Market Manager, Refrigerants, The Chemours Company, LLC

Magen L. Buterbaugh, Global Business Manager, Fluorochemicals, The Chemours Company, LLC

In Support of the Imposition of
Antidumping Duty Orders (continued):

Pedro de la Torre, Global Compliance Officer *and* International Trade Counsel, The Chemours Company, LLC

Omar Irani, Director, Global Products Management, Fluorine Products, Honeywell International Inc.

Lauren Dagostino, Manager, Fluorine Products, Honeywell International Inc.

Richard Winick, Global Sales Director, Fluorine Products, Honeywell International Inc.

Michael E. Ferrans, General Counsel, Fluorine Products, Honeywell International Inc.

Deirdre Maloney, Senior Trade Advisor, Cassidy Levy Kent (USA) LLP

John D. Greenwald)
) – OF COUNSEL
James R. Cannon, Jr.)

In Opposition to the Imposition of
Antidumping Duty Order:

Grunfeld Desiderio Lebowitz Silverman & Klestadt LLP
Washington, DC
on behalf of

Chinese Respondents

James P. Dougan, Vice President, Economic Consulting Services LLC

Ned H. Marshak)
) – OF COUNSEL
Kavita Mohan)

In Opposition to the Imposition of
Antidumping Duty Orders (continued):

Trade Pacific PLLC
Washington, DC
on behalf of

National Refrigerants, Inc.

Maureen Beatty, Vice President of Operations, National Refrigerants, Inc.

Jarrod M. Goldfeder)
) – OF COUNSEL
Jonathan M. Freed)

INTERESTED PARTY:

The New Era Group
Atlanta, GA

Kenneth M. Ponder, President, Choice Refrigerants

CLOSING REMARKS:

Petitioner (**John D. Greenwald** *and* **James R. Cannon, Jr.**, Cassidy Levy Kent (USA) LLP)
Respondents (**Jonathan M. Freed**, Trade Pacific PLLC *and* **Ned H. Marshak**, Grunfeld Desiderio Lebowitz Silverman & Klestadt LLP)

APPENDIX C

SUMMARY DATA

Table C-1
HFC: Summary data concerning the U.S. market, 2012-14, January to March 2014, and January to March 2015
(Quantity=short tons; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per short ton; Period changes=percent--exceptions noted)

	Report data					Period changes			
	Calendar year			January to March		Calendar year			Jan-Mar
	2012	2013	2014	2014	2015	2012-14	2012-13	2013-14	2014-15
U.S. consumption quantity:									
Amount	***	***	***	***	***	***	***	***	***
Producers' share (fn1)	***	***	***	***	***	***	***	***	***
Importers' share (fn1):									
China	***	***	***	***	***	***	***	***	***
All others sources	***	***	***	***	***	***	***	***	***
Total imports	***	***	***	***	***	***	***	***	***
U.S. consumption value:									
Amount	***	***	***	***	***	***	***	***	***
Producers' share (fn1):									
Fully domestic	***	***	***	***	***	***	***	***	***
Marginal value added to imports	***	***	***	***	***	***	***	***	***
Overall U.S. producers' U.S. shipment value	***	***	***	***	***	***	***	***	***
Importers' share (fn1):									
China	***	***	***	***	***	***	***	***	***
All others sources	***	***	***	***	***	***	***	***	***
Total imports	***	***	***	***	***	***	***	***	***
U.S. importers' U.S. shipments of imports (combining covered HFC components and covered HFC blends) from:									
China:									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***	***	***	***
All other source:									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***	***	***	***
Total imports:									
Quantity	6,370	16,874	19,661	***	***	208.6	164.9	16.5	***
Value	29,528	61,240	65,134	***	***	120.6	107.4	6.4	***
Unit value	$4,635	$3,629	$3,313	***	***	(28.5)	(21.7)	(8.7)	***
Ending inventory quantity	3,127	4,443	4,315	***	***	38.0	42.1	(2.9)	***
U.S. producers':									
Average capacity quantity components	162,590	162,275	159,251	***	***	(2.1)	(0.2)	(1.9)	***
Production quantity components	123,826	124,242	117,896	***	***	(4.8)	0.3	(5.1)	***
Capacity utilization components (fn1)	76.2	76.6	74.0	***	***	(2.1)	0.4	(2.5)	***
Average capacity quantity blends	98,645	100,136	102,726	***	***	4.1	1.5	2.6	***
Production quantity blends	50,369	58,974	61,484	***	***	22.1	17.1	4.3	***
Capacity utilization blends (fn1)	51.1	58.9	59.9	***	***	8.8	7.8	1.0	***
U.S. shipments of components (covered and R-134a):									
Quantity	***	***	***	***	***	***	***	***	***
Value:	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
U.S. shipments of blends:									
Quantity	***	***	***	***	***	***	***	***	***
Value:	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Combined U.S. shipments (fn3):									
Quantity	***	***	***	***	***	***	***	***	***
Value:									
Fully domestic	***	***	***	***	***	***	***	***	***
Marginal value added to imports	***	***	***	***	***	***	***	***	***
Overall U.S. producers' U.S. shipment value	***	***	***	***	***	***	***	***	***
Export shipments of components (covered and R-134a):									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Export shipments of blends:									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Ending inventory quantity components	***	***	***	***	***	***	***	***	***
Inventories/total shipments components (fn1)	***	***	***	***	***	***	***	***	***
Ending inventory quantity blends	***	***	***	***	***	***	***	***	***
Inventories/total shipments blends (fn1)	***	***	***	***	***	***	***	***	***
Employment data relating to components (covered and R-134a):									
Production workers	149	156	154	152	108	3.4	4.7	(1.3)	(28.9)
Hours worked (1,000s)	346	362	357	88	64	3.2	4.6	(1.4)	(27.3)
Wages paid ($1,000)	14,077	14,939	14,948	3,737	2,751	6.2	6.1	0.1	(26.4)
Hourly wages (dollars)	$40.68	$41.27	$41.87	$42.47	$42.98	2.9	1.4	1.5	1.2
Productivity (short tons per 1,000 hours)	357.9	343.2	330.2	406.6	297.3	(7.7)	(4.1)	(3.8)	(26.9)
Unit labor costs	$113.68	$120.24	$126.79	$104.44	$144.57	11.5	5.8	5.4	38.4
Employment data relating to blends:									
Production workers	191	209	231	213	215	20.9	9.4	10.5	0.9
Hours worked (1,000s)	368	417	467	110	109	26.8	13.2	12.0	(0.9)
Wages paid ($1,000)	8,656	10,593	11,917	2,920	2,751	37.7	22.4	12.5	(5.8)
Hourly wages (dollars)	$23.50	$25.40	$25.52	$26.55	$25.24	8.6	8.1	0.5	(4.9)
Productivity (short tons per 1,000 hours)	136.7	141.4	131.7	142.1	126.6	(3.7)	3.4	(6.9)	(10.9)
Unit labor costs	$171.85	$179.62	$193.82	$186.75	$199.33	12.8	4.5	7.9	6.7

Table continued next page.

Table C-1--Continued
HFC: Summary data concerning the U.S. market, 2012-14, January to March 2014, and January to March 2015
(Quantity=short tons; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per short ton; Period changes=percent--exceptions noted)

	Report data					Period changes			
	Calendar year			January to March		Calendar year			Jan-Mar
	2012	2013	2014	2014	2015	2012-14	2012-13	2013-14	2014-15
Net Sales:									
Quantity	75,992	78,211	82,022	21,357	18,920	7.9	2.9	4.9	(11.4)
Value	475,733	415,349	402,271	104,261	90,387	(15.4)	(12.7)	(3.1)	(13.3)
Unit value	6,260	5,311	4,904	4,882	4,777	(21.7)	(15.2)	(7.6)	(2.1)
Cost of goods sold (COGS)	382,479	385,077	387,860	99,896	85,795	1.4	0.7	0.7	(14.1)
Gross profit of (loss)	93,254	30,272	14,411	4,365	4,592	(84.5)	(67.5)	(52.4)	5.2
SG&A expenses	38,111	36,730	32,560	9,575	7,089	(14.6)	(3.6)	(11.4)	(26.0)
Operating income or (loss)	55,143	(6,458)	(18,149)	(5,210)	(2,497)	fn2	fn2	181.0	(52.1)
Net income or (loss)	54,906	(6,626)	(18,755)	(5,258)	(2,705)	fn2	fn2	183.1	(48.6)
Capital expenditures	14,452	12,061	11,059	2,625	4,363	(23.5)	(16.5)	(8.3)	66.2
Unit COGS	$5,033	$4,924	$4,729	$4,677	$4,535	(6.0)	(2.2)	(4.0)	(3.1)
Unit SG&A expenses	$502	$470	$397	$448	$375	(20.8)	(6.4)	(15.5)	(16.4)
Unit operating income or (loss)	$726	$(83)	$(221)	$(244)	$(132)	fn2	fn2	168.0	(45.9)
Unit net income or (loss)	$723	$(85)	$(229)	$(246)	$(143)	fn2	fn2	169.9	(41.9)
COGS/sales (fn1)	80.4	92.7	96.4	95.8	94.9	16.0	12.3	3.7	(0.9)
Operating income or (loss)/sales (fn1)	11.6	(1.6)	(4.5)	(5.0)	(2.8)	(16.1)	(13.1)	(3.0)	2.2
Net income or (loss)/sales (fn1)	11.5	(1.6)	(4.7)	(5.0)	(3.0)	(16.2)	(13.1)	(3.1)	2.1

Notes:

fn1.--Report data are in percent and period changes are in percentage points.
fn2.--Undefined.
fn3.--Combined U.S. shipments eliminate double counting between levels of production and any imported components used to create U.S. blends. This data does not include any commercially sold nonsubject R-134a. See part III for more a detailed explination of the adjustments.

Note.--Unless otherwise specified the data in this table represent both covered HFC components and HFC blends.

Source: Compiled from data submitted in response to Commission questionnaires, see parts III, IV, and VI for detailed analysis.

Table C-2
HFC: Select summary data excluding U.S. producer National, 2012-14, January to March 2014, and January to March 2015

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APPENDIX D

DETAILED RELATED PARTY TABLES SHOWING PRODUCTION AND IMPORTS BY FIRM

Table D-1
HFC: * U.S. production and direct imports of subject merchandise, 2012-14, January to March 2014, and January to March 2015**

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Table D-2
HFC: * U.S. production and direct imports of subject merchandise, 2012-14, January to March 2014, and January to March 2015**

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Table D-3
HFC: * U.S. production and direct imports of subject merchandise, 2012-14, January to March 2014, and January to March 2015**

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Table D-4
HFC: * U.S. production and direct imports of subject merchandise, 2012-14, January to March 2014, and January to March 2015**

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Table D-5
HFC: * U.S. production and direct imports of subject merchandise, 2012-14, January to March 2014, and January to March 2015**

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APPENDIX E

COMMERCIAL U.S. SHIPMENTS BY PRODUCT AND CHANNEL

Table E-1
HFC: U.S. producers' commercial U.S. shipments of components by product and by channel, 2012-14

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Table E-2
HFC: U.S. producers' commercial U.S. shipments of blends by product and by channel, 2012-14

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Table E-3
HFC: U.S. importers' commercial U.S. shipments of imports of components from China by product and by channel, 2012-14

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Table E-4
HFC: U.S. importers' commercial U.S. shipments of imports of blends from China by product and by channel, 2012-14

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Table E-5
HFC: U.S. importers' commercial U.S. shipments of imports of components from all other sources by product and by channel, 2012-14

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Table E-6
HFC: U.S. importers' commercial U.S. shipments of imports of blends from all other sources by product and by channel, 2012-14

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APPENDIX F

NARRATIVE RESPONSE TO LIKE PRODUCT QUESTIONS

Table F-1
HFC: U.S. producers' and U.S. importers' narrative responses as to whether components are dedicated to production of HFC blends, 2012-14, January to March 2014, and January to March 2015

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Table F-2
HFC: U.S. producers' and U.S. importers' narrative responses as to whether components have differences in markets than HFC blends, 2012-14, January to March 2014, and January to March 2015

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Table F-3
HFC: U.S. producers' and U.S. importers' narrative responses as to whether components have differences in physical characteristics than HFC blends, 2012-14, January to March 2014, and January to March 2015

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Table F-4
HFC: U.S. producers' and U.S. importers' narrative responses as to whether components have differences in price of value than HFC blends, 2012-14, January to March 2014, and January to March 2015

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Table F-5
HFC: U.S. producers' and U.S. importers' narrative responses as to whether components require extensive process to convert to an HFC blend, 2012-14, January to March 2014, and January to March 2015

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Table F-6
HFC: U.S. producers' and U.S. importers' narrative responses as to the interchangeability of individual HFC blends, 2012-14, January to March 2014, and January to March 2015

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Table F-7
HFC: U.S. producers' and U.S. importers' narrative responses as to the out-of-scope related products CFC/HCFC blends, 2012-14, January to March 2014, and January to March 2015

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Table F-8
HFC: U.S. producers' and U.S. importers' narrative responses as to the out-of-scope related products HFOs, 2012-14, January to March 2014, and January to March 2015

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APPENDIX G

ALTERNATE APPARENT CONSUMPTION ANALYSIS CONSIDERING HFC COMPONENTS AND HFC BLENDS AS SEPARATE MARKETS

Table G-1
HFC: Apparent U.S. consumption and market shares for covered HFC components ONLY, 2012-14, January to March 2014, and January to March 2015

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Table G-2
HFC: Subject U.S. imports of covered HFC components controlled by U.S. producers, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

Table G-3
HFC: Apparent U.S. consumption and market shares for covered HFC blends ONLY, 2012-14, January to March 2014, and January to March 2015

* * * * * * *

Table G-4
HFC: Subject U.S. imports of covered HFC blends controlled by U.S. producers, 2012-14, January to March 2014, and January to March 2015

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APPENDIX H

RESPONSES OF U.S. PRODUCERS CONCERNING THE ACTUAL OR POTENTIAL NEGATIVE EFFECTS OF IMPORTS OF HFC COMPONENTS AND BLENDS FROM CHINA

Table H-1
HFC blends and components: Negative impact of imports from China

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Source: Compiled from data submitted in response to Commission questionnaires.

Table H-2
HFC blends and components: Anticipated negative impact of imports from China

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Source: Compiled from data submitted in response to Commission questionnaires.