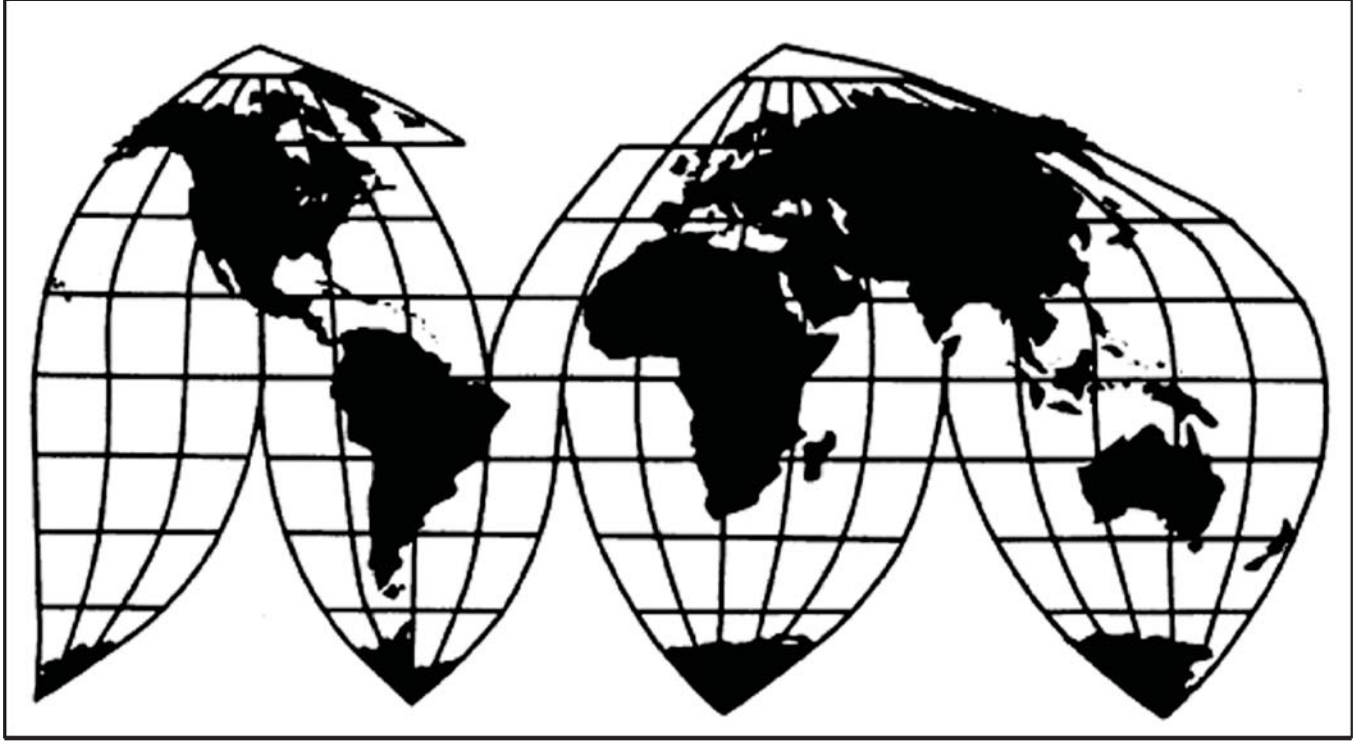
Silicon Metal from Australia, Brazil, Kazakhstan, and Norway

Investigation Nos. 701-TA-567-569 and 731-TA-1343-1345 (Preliminary)

Publication 4685 **May 2017**

U.S. International Trade Commission



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Note.—Information that would reveal confidential operations of individual concerns may not be published and therefore has been deleted. Such deletions are indicated by asterisks.

UNITED STATES INTERNATIONAL TRADE COMMISSION

Investigation Nos. 701-TA-567-569 and 731-TA-1343-1345 (Preliminary)
Silicon Metal from Australia, Brazil, Kazakhstan, and Norway

DETERMINATIONS

On the basis of the record[1] developed in the subject investigations, 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 silicon metal from Australia, Brazil, and Norway, provided for in subheadings 2804.69.10 and 2804.69.50 of the Harmonized Tariff Schedule of the United States, that are alleged to be sold at less-than-fair-value ("LTFV") and imports of silicon metal alleged to be subsidized by the governments of Australia, Brazil, and Kazakhstan.

COMMENCEMENT OF FINAL PHASE INVESTIGATIONS

Pursuant to section 207.18 of the Commission's rules, the Commission also gives notice of the commencement of the final phase of its investigations. 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 affirmative preliminary determinations in the investigations under sections 703(b) or 733(b) of the Act, or, if the preliminary determinations are negative, upon notice of affirmative final determinations in those investigations under sections 705(a) or 735(a) of the Act. Parties that filed entries of appearance in the preliminary phase of the investigations need not enter a separate appearance for the final phase of the investigations. 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 investigations.

BACKGROUND

On March 8, 2017, Globe Specialty Metals, Inc., Beverly, Ohio filed a petition with the Commission and Commerce, alleging that an industry in the United States is materially injured or threatened with material injury by reason of subsidized imports of silicon metal from Australia, Brazil, and Kazakhstan, and LTFV imports of silicon metal from Australia, Brazil, and Norway. Accordingly, effective March 8, 2017, the Commission, pursuant to sections 703(a) and 733(a) of the Act (19 U.S.C. 1671b(a) and 1673b(a)), instituted countervailing duty

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

investigation Nos. 701-TA-567-569 and antidumping duty investigation Nos. 731-TA-1343-1345 (Preliminary).

Notice of the institution of the Commission's investigations 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 March 14, 2017 (82 FR 16353). The conference was held in Washington, DC, on March 29, 2017, 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 these investigations, we determine that there is a reasonable indication that an industry in the United States is materially injured by reason of imports of silicon metal from Australia, Brazil, and Norway that are allegedly sold in the United States at less than fair value and imports of silicon metal that are allegedly subsidized by the governments of Australia, Brazil, and Kazakhstan.

I. The Legal Standard for Preliminary Determinations

The legal standard for preliminary antidumping and countervailing duty determinations 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

Globe Specialty Metals, Inc., the parent company of U.S. silicon metal producer Globe Metallurgical Inc. (collectively "Globe" or "petitioner"), filed the petitions in these investigations on March 8, 2017. Petitioner appeared at the staff conference and submitted a postconference brief.

A number of respondent entities participated in these investigations: Simcoa Operations Pty., Ltd. ("Simcoa") and Shintech Inc. ("Shintech"), respectively a producer and importer of subject merchandise from Australia; Ligas de Alumínio S/A ("LIASA") and Companhia Ferroligas Minas Gerais ("MINASLIGAS"), both producers of subject merchandise from Brazil; Elkem Silicon Materials ("Elkem"), a producer of subject merchandise from Norway; Wacker Chemical Norway ("Wacker Norway"), a producer of subject merchandise from Norway, Wacker Polysilicon North America, a U.S. purchaser of subject merchandise, and Wacker Chemie AG, the parent company of Wacker Norway and Wacker Polysilicon North America (collectively "Wacker"); MPM Holdings Inc. ("MPM"), an importer and purchaser of subject merchandise; REC Silicon Inc., REC Solar Grade Materials LLC, and REC Advanced Silicon

[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). No party argues that the establishment of an industry in the United States is materially retarded by the allegedly unfairly traded imports.

[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).

Materials LLC. (collectively "REC"), U.S. purchasers and importers of subject merchandise; and Dow Corning Corporation ("Dow Corning"), a U.S. importer of subject merchandise and the parent company of Dow Corning Alabama ("DC Alabama"), a U.S. producer of silicon metal. Simcoa, Shintech, Wacker, LIASA, MINASLIGAS, MPM, and REC appeared at the conference. Five sets of postconference briefs were filed by respondent parties: one each from MPM, REC, and Dow Corning; one filed jointly by LIASA and MINASLIGAS ("LIASA's Postconference Brief"); and one filed jointly by Simcoa, Shintech and Wacker, which Elkem also joined ("Joint Respondents' Postconference Brief").

Data Coverage. U.S. industry data are based on the questionnaire responses of three producers, accounting for virtually all U.S. production of silicon metal in 2016.[3] U.S. import data are based on official Commerce import statistics and from questionnaire responses from 15 U.S. importers, accounting for virtually all subject imports from Australia and Brazil, 96.6 percent of subject imports from Kazakhstan, and 96.4 percent of subject imports from Norway in 2016.[4] The Commission received responses to its questionnaires from nine foreign producers of subject merchandise: one producer in Australia, estimated to account for *** production of subject merchandise in Australia in 2016; four producers in Brazil, estimated to account for approximately 95 percent of production of subject merchandise in Brazil in 2016; two producers in Kazakhstan, estimated to account for *** production of subject merchandise in Kazakhstan in 2016; and two producers in Norway, estimated to account for approximately *** percent of production of subject merchandise in Norway in 2016.[5]

III. Domestic Like Product

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."[6] 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."[7] 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."[8]

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.[9] No single factor is

[3] Confidential Report ("CR") at I-5; Public Report ("PR") at I-4.

[4] CR at I-5 to I-6; PR at I-4.

[5] CR at I-6, VII-3, VII-9, VII-16, VII-23; PR at I-4, VII-3, VII-7, VII-11, VII-15.

[6] 19 U.S.C. § 1677(4)(A).

[7] 19 U.S.C. § 1677(4)(A).

[8] 19 U.S.C. § 1677(10).

[9] *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* (Continued…)

dispositive, and the Commission may consider other factors it deems relevant based on the facts of a particular investigation.[10] The Commission looks for clear dividing lines among possible like products and disregards minor variations.[11] Although the Commission must accept Commerce's determination as to the scope of the imported merchandise that is subsidized and/or sold at less than fair value,[12] the Commission determines what domestic product is like the imported articles Commerce has identified.[13]

In its notices of initiation, Commerce defined the imported merchandise within the scope of these investigations as:

> The scope of these investigations covers all forms and sizes of silicon metal, including silicon metal powder. Silicon metal contains at least 85.00 percent but less than 99.99 percent silicon, and less than 4.00 percent iron, by actual weight. Semiconductor grade silicon (merchandise containing at least 99.99 percent silicon by actual weight and classifiable under Harmonized Tariff Schedule of the United States (HTSUS) subheading 2804.61.0000) is excluded from the scope of these investigations.

(…Continued)
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).

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

[11] *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.").

[12] *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).

[13] *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).

Silicon metal is currently classifiable under subheadings 2804.69.1000 and 2804.69.5000 of the HTSUS. While HTSUS numbers are provided for convenience and customs purposes, the written description of the scope remains dispositive.[14]

Silicon metal is normally composed almost entirely of elemental silicon, along with small amounts of other elements such as iron, aluminum, and calcium. It is manufactured and sold in various degrees of purity. It is usually sold in lump or powder form. Silicon metal is used as an alloying agent in the production of both primary aluminum (produced from ore) and secondary aluminum (produced from scrap). Silicon metal is also used by the chemical industry as an input in the production of silicones and polysilicon.[15]

A. Arguments of the Parties

Petitioner's *Argument*. Globe argues that the Commission should define a single domestic like product consisting of all silicon metal within the scope. It states that in all prior Commission investigations and five-year reviews involving silicon metal, the Commission defined a single like product consisting of all silicon metal, regardless of grade (except semiconductor grade metal, which is excluded from the scope of these investigations). Globe states that nothing has changed with respect to any of the Commission's domestic like product factors since the Commission's most recent like product analysis with respect to silicon metal.[16]

Respondents' *Argument*. Joint Respondents state that they do not contest, for the limited purposes of the preliminary phase of the investigations, the definition of a single domestic like product of silicon metal, and do not advocate any alternative definition(s) of the domestic like product. They state, however, that there are several considerations that could merit reassessment of the Commission's prior findings of a single domestic like product with respect to silicon metal.[17]

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[14] *Silicon Metal from Australia, Brazil, and Norway: Initiation of Less-Than-Fair-Value Investigations*, 82 Fed. Reg. 16352, 16356 (Apr. 4, 2017); *Silicon Metal from Australia, Brazil, and Kazakhstan: Initiation of Countervailing Duty Investigations*, 82 Fed. Reg. 16356, 16360 (Apr. 4, 2017).

[15] CR at I-17 to I-19; PR at I-12 to I-13.

[16] Transcript of Conference ("Conf. Tr.") at 46 (Kramer); *see Silicon Metal from Russia*, Inv. No. 731-TA-991 (Second Review), USITC Pub. No. 4471 at 7 (June 2014); *see also* Petition at 12-14; Globe's Postconference Brief at 4-7.

[17] Joint Respondents assert that the petition significantly expanded the scope of the investigations by including material with silicon metal content as low as 85 percent, while the scope of previous investigations was limited to silicon metal with a silicon content of at least 96 percent. They argue that market composition and demand for silicon metal have changed as the consumption of "ultra-pure" silicon metal for use in the polysilicon industry has greatly expanded. They contend that the silicon metal market is much more segmented now, with differences in like product factors such as physical characteristics, uses, channels of distribution, interchangeability, and prices between the grades of silicon metal used in the low-end market segment for primary and secondary aluminum and those used in the high-end market segments for polysilicon and chemical consumption. Joint Respondents nonetheless do not purport to identify a clear dividing line between different domestically produced (Continued…)

B. Analysis

Based on the record, we define a single domestic like product consisting of silicon metal.

*Physical Characteristics and Uses. S*ilicon metal is normally composed almost entirely of elemental silicon, along with small amounts of other elements, such as iron, aluminum, and calcium. Most silicon metal is purchased by chemical manufacturers, which use it to produce silicones and polysilicon, and by aluminum producers, which use it as an alloying agent.[18] Although silicon metal is often described in terms of different "grades," there is no uniformly accepted grade classification system, and "grades" generally refer to the range of specifications in the product sold to particular types of customers (*e.g.,* minimum amounts of silicon and maximum amounts of other elements that the silicon metal may contain).[19] According to petitioner, silicon metal of all grades has the same physical appearance, although it may be in lump or powder form.[20]

Manufacturing Facilities, Production Processes and Employees. All domestically produced silicon metal, regardless of specification, is produced using the same process and basic inputs. Producers typically manufacture different grades of silicon metal using the same facilities and employees, and often use the same furnaces to produce different grades of silicon metal.[21]

Channels of Distribution. Domestic producers sell silicon metal directly to end users. In 2016, *** percent) of U.S. producers' U.S. commercial shipments of silicon metal went to chemical producers, while *** percent went to secondary aluminum producers, *** percent went to primary aluminum producers, and *** percent went to other end users. A *** percentage (*** percent) of U.S. producers' shipments went to distributors.[22]

Interchangeability. Globe asserts that silicon metal is interchangeable within any given grade. Moreover, it contends that the differences in specifications between different grades of silicon metal for different end uses are very small, and higher-grade silicon metal can be and often is sold for lower-grade applications.[23]

Producer and Customer Perceptions. According to Globe, producers and customers perceive all silicon metal within the scope to be a single product.[24]

(…Continued)
silicon metal products during the preliminary phase of these investigations. Joint Respondents' Postconference Brief at 6-7 and Exh. 1 at 5-6.

[18] CR at I-17 to I-19; PR at I-12 to I-13; Conf. Tr. at 18 (Perkins).

[19] Conf. Tr. at 18-19 (Perkins); CR at I-19 to I-20; PR at I-13 to I-14.

[20] Globe's Postconference Brief at 4-5.

[21] Subject Norwegian producer Elkem produces a silicon metal product (Silgrain) using a different proprietary production process, which is not used by any domestic silicon metal producer. Conference Tr. at 27-28 (Huck); Petition at 14 and n.38.

[22] CR/PR at Table II-1; Petition at 14.

[23] Globe's Postconference Brief at 5, 13; Conf. Tr. at 19 (Perkins); CR at I-19; PR at I-13.

[24] *See* Petition at 13; Globe's Postconference Brief at 5.

Price. According to petitioner, there are relatively minor differences in price among different grades of silicon metal.[25] Prices of the three domestically produced silicon metal products for which the staff collected data fell within a fairly narrow range.[26]

Conclusion. Based on the limited record in the preliminary phase of these investigations, and the absence of argument to the contrary, there does not appear to be any clear dividing line between domestically produced silicon metal products. We therefore define a single domestic like product that is coextensive with the scope, consisting of silicon metal.[27]

IV. Domestic Industry

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 a major proportion of the total domestic production of the product."[28] 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.

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. 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.[29] Exclusion of such a producer is within the Commission's discretion based upon the facts presented in each investigation.[30]

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[25] Petition at 14.

[26] CR/PR at Tables V-3 to V-5.

[27] To the extent that respondents seek for the Commission to reexamine the definition of the domestic like product in any final phase of these investigations, they should identify any other potential like products for data collection in their comments on the draft questionnaires.

[28] 19 U.S.C. § 1677(4)(A).

[29] *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).

[30] 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 (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);

(3) whether inclusion or exclusion of the related party will skew the data for the rest of the industry;

(4) the ratio of import shipments to U.S. production for the imported product; and

(5) whether the primary interest of the importing producer lies in domestic production or importation. *Changzhou Trina Solar Energy Co. v. USITC*, 100 F. Supp.3d 1314, 1326-31 (Ct. Int'l. Trade 2015); see *also Torrington Co. v. United States*, 790 F. Supp. at 1168.

U.S. producer DC Alabama is affiliated with Brazilian producer Dow Corning Silicio do Brasil Industia e Comercio Ltda. ("DC Brazil"), which exports subject merchandise to the United States and is owned by the same parent company, Dow Corning.[31] The parent company, Dow Corning, imported subject merchandise from Brazil during the January 2014 to December 2016 period of investigation ("POI").[32] Since DC Alabama is directly controlled by U.S. importer Dow Corning, DC Alabama is a related party under 19 U.S.C. § 1677(4)(B)(ii)(II).

U.S. producer Mississippi Silicon LLC ("Mississippi Silicon") shares common ownership with Brazilian producer RIMA Industrial SA ("RIMA"), an exporter of subject merchandise, as well as with U.S. importer Polymet Alloys ("Polymet"), an importer of subject merchandise from Brazil.[33] While the record does not contain information sufficient to make clear the exact nature of the corporate ownership relationship between Mississippi Silicon and the other two firms, we assume *arguendo* for purposes of our analysis that a control relationship exists between Mississippi Silicon and RIMA and/or Polymet under 19 U.S.C. § 1677(4)(B)(ii), and that Mississippi Silicon is therefore a related party.

Arguments of the Parties. Globe argues that the Commission should exclude DC Alabama from the domestic industry, but should not exclude Mississippi Silicon.[34] Globe states that Dow Corning's imports of subject merchandise from Brazil *** DC Alabama's domestic production during the POI, and that Dow Corning's predominant interest is that of an importer and end user of subject merchandise, not of a domestic producer. Globe asserts that Dow Corning benefits from the dumped sales of and subsidies received by its Brazilian affiliate, and that inclusion of DC Alabama's data would skew the data for the domestic industry.[35]

Respondents argue that DC Alabama should not be excluded from the domestic industry, asserting that in addition to DC Alabama's production of silicon metal at its Alabama plant, Dow Corning has ***. Respondents state that when Dow Corning's *** production of silicon metal is taken into account, the overall domestic production by Dow Corning *** the imports from its Brazilian affiliate, and makes it the largest U.S. producer of silicon metal. Respondents argue that Dow Corning's predominant interest is thus in domestic production, and that exclusion of it would significantly distort the data for the domestic industry.[36] Respondents argue that Dow Corning does not import subject merchandise to benefit from the alleged unfair trade practices of Brazil, but because it cannot satisfy its demand for silicon metal meeting its quality specifications sourcing solely from U.S. producers.[37]

Analysis. DC Alabama. Dow Corning imported *** short tons contained silicon ("short tons") of silicon metal from Brazil in 2014, *** short tons in 2015, and *** short tons in 2016.[38]

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[31] CR/PR at Table III-2.

[32] CR/PR at Table III-10.

[33] CR/PR at Table III-2.

[34] Globe's Postconference Brief at 7-10.

[35] Globe's Postconference Brief at 9-10.

[36] Dow Corning's Postconference Brief at 4-5, 6-7; Joint Respondents' Postconference Brief, Exh. 1, at 2-3. ***. CR/PR at Table III-3.

[37] Dow Corning's Postconference Brief at 5-7; Joint Respondents' Postconference Brief, Exh. 1, at 2-3.

[38] CR/PR at Table III-10.

DC Alabama produced *** short tons of silicon metal in 2014, *** short tons in 2015, and *** short tons in 2016. The ratio of Dow Corning's imports of subject merchandise to DC Alabama's U.S. production was *** percent in 2014, *** percent in 2015, and *** percent in 2016.[39] DC Alabama reported capital expenditures of $*** in 2014, $*** in 2015, and $*** in 2016.[40] DC Alabama's operating margin was *** percent in 2014, *** percent in 2015, and *** percent in 2016; it was *** the industry average in 2014, but *** the industry average in 2015 and 2016.[41] DC Alabama *** the petitions.[42]

We find that appropriate circumstances exist to exclude DC Alabama from the domestic industry. The *** ratio of Dow Corning's subject imports to DC Alabama's domestic production suggests that corporate parent Dow Corning's primary interest is importation rather than domestic production by DC Alabama. DC Alabama's capital expenditures were *** than those of the other domestic producers,[43] and it ***.

Mississippi Silicon. Polymet imported *** short tons of silicon metal from Brazil in 2014, *** short tons in 2015, and *** short tons in 2016.[44] Mississippi Silicon produced *** short tons in 2014, *** short tons in 2015, and *** short tons in 2016. The ratio of Polymet's imports of subject merchandise to Mississippi Silicon's U.S. production was *** percent in 2015 and *** percent in 2016.[45] Mississippi Silicon reported capital expenditures of $*** in 2014, $*** in 2015, and $*** in 2016. In 2014 and 2015, it was responsible for *** of the capital expenditures for the three domestic producers.[46] Mississippi Silicon's operating margin was *** percent in 2015, and *** percent in 2016; its operating margin was *** the industry average in 2015 and 2016.[47] Mississippi Silicon *** the petitions ***.[48]

We find that appropriate circumstances do not exist to exclude Mississippi Silicon from the domestic industry. While its domestic production was *** by the subject imports of its affiliated U.S. importer in 2015, its domestic production was *** the subject imports of its affiliate in 2016, its first full year of production, indicating that by the end of the POI the firm's predominant interest was domestic production. Moreover, Mississippi Silicon reported substantial capital expenditures of $*** during the POI.

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[39] We do not attribute to Dow Corning or DC Alabama *** for purposes of this analysis. The record indicates that ***. EDIS Document No. 608839. Pursuant to ***. Dow Corning's Postconference Brief at 4 and n.7; EDIS Document No. 608839. Globe Metallurgical Inc. ***. *See* Globe's U.S. producers' questionnaire response (EDIS Document No. 606235); EDIS Document No. 608839. Dow Corning ***, nor did DC Alabama ***. *See* DC Alabama's U.S. producers' questionnaire response (EDIS Document No. 606282).

[40] CR/PR at Table VI-4.

[41] CR/PR at Table VI-2.

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

[43] *See* CR/PR at Table VI-4.

[44] CR/PR at Table III-10.

[45] CR/PR at Table III-10.

[46] CR/PR at Table VI-4.

[47] CR/PR at Table VI-2.

[48] CR/PR at Table III-1; ***.

Accordingly, we define the domestic industry to include all U.S. producers of silicon metal except DC Alabama.[49]

V. Negligible Imports

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.[50] The statute further provides that subject imports from a single country which comprise less than 3 percent of total such imports of the product may not be considered negligible if there are several countries subject to investigation with negligible imports and the sum of such imports from all those countries collectively accounts for more than 7 percent of the volume of all such merchandise imported into the United States.[51] In the case of countervailing duty investigations involving developing countries (as designated by the United States Trade Representative), the statute indicates that the negligibility limits are 4 percent and 9 percent, rather than 3 percent and 7 percent.[52]

During the period March 2016 - February 2017, the 12-month period preceding the filing of the petition, subject imports from Australia accounted for 10.6 percent of total U.S. imports of silicon metal by quantity, subject imports from Brazil accounted for 46.0 percent of total U.S. imports of silicon metal by quantity, subject imports from Kazakhstan accounted for 5.9 percent of total U.S. imports of silicon metal by quantity, and subject imports from Norway accounted for 8.4 percent of total U.S. imports of silicon metal by quantity.[53] Because subject imports from each subject country were well above the pertinent statutory negligibility thresholds, we find that subject imports from Australia, Brazil, Kazakhstan, and Norway are not negligible.

VI. Cumulation

For purposes of evaluating the volume and effects for a determination of reasonable indication of material injury by reason of subject imports, section 771(7)(G)(i) of the Tariff Act requires the Commission to cumulate subject imports from all countries as to which petitions were filed and/or investigations self-initiated by Commerce on the same day, if such imports

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[49] We intend to examine this issue further in any final phase of these investigations, including why Dow Corning uses subject imports as a source of supply to the extent that it does, rather than relying more on domestic production by its subsidiary DC Alabama or on purchases from other domestic sources.

[50] 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)).

[51] 19 U.S.C. § 1677(24)(A)(ii).

[52] 19 U.S.C. § 1677(24)(B). The United States Trade Representative has designated Brazil and Kazakhstan as developing countries. S*ee* 15 C.F.R. § 2013.1 (developing countries for purposes of 19 U.S.C. § 1677(36)).

[53] CR/PR at Table IV-3.

compete with each other and with the domestic like product in the U.S. market. In assessing whether subject imports compete with each other and with the domestic like product, the Commission generally has considered four factors:

(1) the degree of fungibility between subject imports from different countries and between subject imports and the domestic like product, including consideration of specific customer requirements and other quality related questions;

(2) the presence of sales or offers to sell in the same geographic markets of subject imports from different countries and the domestic like product;

(3) the existence of common or similar channels of distribution for subject imports from different countries and the domestic like product; and

(4) whether the subject imports are simultaneously present in the market.[54]

While no single factor is necessarily determinative, and the list of factors is not exclusive, these factors are intended to provide the Commission with a framework for determining whether the subject imports compete with each other and with the domestic like product.[55] Only a "reasonable overlap" of competition is required.[56]

A. Arguments of the Parties

Globe argues that imports from all four subject countries should be cumulated. It asserts that the domestic like product and subject imports from all sources are fungible.[57] It argues that there is substantial overlap in distribution channels between the domestic like product and subject imports from all sources, especially in shipments to secondary aluminum producers.[58] It further states that subject imports and the domestic like product are present in overlapping geographic markets and were simultaneously present in the U.S. market.[59] Globe

[54] *See Certain Cast-Iron Pipe Fittings from Brazil, the Republic of Korea, and Taiwan*, Inv. Nos. 731-TA-278-80 (Final), USITC Pub. 1845 (May 1986), *aff'd, Fundicao Tupy, S.A. v. United States*, 678 F. Supp. 898 (Ct. Int'l Trade), *aff'd*, 859 F.2d 915 (Fed. Cir. 1988).

[55] *See*, *e.g.*, *Wieland Werke, AG v. United States*, 718 F. Supp. 50 (Ct. Int'l Trade 1989).

[56] The Statement of Administrative Action (SAA) to the Uruguay Round Agreements Act (URAA), expressly states that "the new section will not affect current Commission practice under which the statutory requirement is satisfied if there is a reasonable overlap of competition." H.R. Rep. No. 103-316, Vol. I at 848 (1994) (*citing Fundicao Tupy*, 678 F. Supp. at 902); *see Goss Graphic Sys., Inc. v. United States*, 33 F. Supp. 2d 1082, 1087 (Ct. Int'l Trade 1998) ("cumulation does not require two products to be highly fungible"); *Wieland Werke, AG*, 718 F. Supp. at 52 ("Completely overlapping markets are not required.").

[57] Globe's Postconference Brief at 28-29.

[58] Globe's Postconference Brief, Appendix A, at 2-4.

[59] Globe's Postconference Brief at 29-30.

argues that U.S. suppliers produce silicon metal that competes directly with subject imports from all countries, including Brazil.[60]

Respondents argue that subject imports from Brazil should not be cumulated with imports from the other three subject countries.[61] They argue that silicon metal from Brazil is not fungible with subject imports from other subject sources and the domestic like product, because silicon metal from Brazil has uniquely low boron content and low levels of other impurities, which are very important to U.S. purchasers in the polysilicon and chemical industries.[62]

They contend that subject imports from Brazil are sold in the U.S. market through different channels of distribution than the domestic like product and silicon metal from other subject sources. They assert that the *** of silicon metal exports to the United States from Brazil were produced by DC Brazil and captively consumed by Dow Corning in manufacturing downstream products, and that the other two Brazilian producers also have unique distribution channels.[63] LIASA argues that subject imports from Brazil have limited geographic overlap with the domestic like product and subject imports from other sources.[64]

Joint Respondents argue that subject imports from Kazakhstan should not be cumulated with imports from the other three subject countries. They assert that subject imports from Kazakhstan are of lower quality and are incapable of serving the largest end-use applications in the U.S. market, polysilicon and chemicals, and thus are not fungible with subject imports from the other sources. Joint Respondents further argue that subject imports from Kazakhstan have a unique channel of distribution different from those for all other subject imports. Finally, they assert that subject imports from Kazakhstan were not in the U.S. market in 2014 and accordingly were not simultaneously present in the market with imports from the other subject countries.[65]

B. Analysis

We consider subject imports from Australia, Brazil, Kazakhstan, and Norway on a cumulated basis because the statutory criteria for cumulation appear to be satisfied. As an initial matter, petitioner filed the antidumping and countervailing duty petitions with respect to all four countries on the same day, March 8, 2017.[66]

Fungibility. A majority of U.S. producers and U.S. importers reported that the domestic like product and subject imports from each of the four subject countries are "always" or "frequently" interchangeable, with one exception.[67] With several exceptions, majorities of U.S.

[60] Globe's Postconference Brief, Appendix A, at 4-5.

[61] Joint Respondents adopt the comments of LIASA on this issue. Joint Respondents' Postconference Brief at 27-28.

[62] LIASA's Postconference Brief at 3-6; Dow Corning's Postconference Brief at 9.

[63] LIASA's Postconference Brief at 6-7; Dow Corning's Postconference Brief at 8-9.

[64] LIASA's Postconference Brief at 8.

[65] Joint Respondents' Postconference Brief at 28-29.

[66] None of the statutory exceptions to cumulation applies.

[67] CR/PR at Table II-6. The *** reporting U.S. producers were ***. *Id.*

producers and U.S. importers reported for each country comparison that subject imports from each subject country are "always" or "frequently" interchangeable with subject imports from every other subject country.[68]

While respondents argue that there is attenuated competition between subject imports and the domestic like product, the Commission's pricing data for Product 2 (sales to secondary aluminum producers), reflect sales of the ***, indicating head-to-head competition between the domestic like product and subject imports from all subject countries.[69]

Thus, the record indicates that subject imports from all sources and the domestic like product are generally perceived to be interchangeable, and that there is head-to-head competition between them in sales to secondary aluminum producers. In particular, the record does not support respondents' contention that perceived quality differences significantly limit the fungibility of subject imports from Brazil or Kazakhstan.[70] Accordingly, the record indicates sufficient fungibility between the domestic like product and subject imports from Australia, Brazil, Kazakhstan, and Norway to meet the reasonable overlap standard.

Channels of Distribution. The record indicates some differences between the end-use portions of the market to which domestic producers and importers of silicon metal from different subject countries shipped.[71] Despite these differences, the record indicates an overlap in the secondary aluminum segment, in that *** were shipped to secondary aluminum producers.[72] The record also indicates some overlap of purchasers, notwithstanding

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[68] CR/PR at Table II-6. The six reporting U.S. importers were evenly divided between finding subject imports from Australia and subject imports from Kazakhstan to be "always" or "frequently" interchangeable and finding them "sometimes" or "never" interchangeable. The *** reporting U.S. producers ***. *Id.*

[69] CR/PR at Table V-4.

[70] Indeed, Dow Corning's acknowledged use of both domestically produced silicon metal (including silicon metal from ***) and subject imports from Brazil in its downstream production operations, *see* CR at III-13 n.12; PR at III-5 n.12, undercuts respondents' contentions that domestically produced silicon metal, which includes material obtained through ***, and subject imports from Brazil are not fungible.

[71] The domestic like product was shipped primarily to ***, with a substantial percentage of its shipments going to ***. Subject imports from Australia were shipped primarily to *** with a substantial percentage of its shipments going to ***, and a minimal percentage of its shipments going to ***. Subject imports from Brazil were shipped primarily to ***, with appreciable percentages of its shipments going to *** and to ***. The *** of subject imports from Kazakhstan were shipped to ***, and there were no shipments to ***. Subject imports from Norway were sold primarily to *** and ***, with a minimal amount going to ***. CR/PR at Table II-1. In 2016, a *** percentage of shipments of the domestic like product and subject imports was sold to distributors. Subject imports from Kazakhstan had the *** percentage of shipments going to distributors in 2016 with *** percent, while the percentage of shipments to distributors of the domestic like product and subject imports from each of the other sources was below *** percent. *Id.*

[72] The percentage of shipments of subject imports from Brazil going to secondary aluminum producers was *** percent in 2014, *** percent in 2015, and *** percent in 2016. CR/PR at Table II-1. The percentage of shipments of subject imports from Brazil going to secondary aluminum producers was *** than the corresponding percentages of U.S. shipments of the domestic like product and subject

(Continued…)

respondents' suggestions to the contrary. *** purchaser to respond to the lost sales and lost revenue survey,[73] reported substantial quantities of purchases of domestically produced product and imports from each subject country.[74] *** other purchasers reported purchases of both the domestic like product and subject imports from Brazil.[75]

Moreover, as noted, the Commission's pricing data for Product 2 (sales to secondary aluminum producers) reflect sales of the ***.[76] Thus, despite some differences in the end uses to which the domestic like product and subject imports from the four subject countries are concentrated, the record indicates substantial overlap between the domestic like product and subject imports from all four subject countries in shipments to secondary aluminum producers and shipments to particular purchasers.

Geographic Overlap. The record indicates that silicon metal is generally shipped nationwide, with the exception that subject imports from Australia did not serve the Central Southwest or Mountains regions of the United States. The domestic like product and subject imports from all four subject countries were present in the Northeast, Midwest, Southeast, and Pacific Coast regions of the United States.[77]

Simultaneous Presence in Market. The domestic like product was present in the U.S. market in every month of the POI.[78] Subject imports from Australia, Brazil, and Norway were present in the U.S. market in every month of the POI. Subject imports from Kazakhstan were not present in the U.S. market in 2014, but were present in eight out of 12 months in 2015, and all 12 months in 2016.[79]

Conclusion. As previously discussed, the record indicates some degree of fungibility between the domestic like product and subject imports from Australia, Brazil, Kazakhstan, and Norway.[80] The record reflects that market participants generally perceive the domestic like product and subject imports from all sources to be interchangeable, and that the domestic like

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(…Continued)
imports from Australia, Kazakhstan, and Norway. *Id.* However, since Brazil was *** supplier of subject imports during the POI, *see* CR/PR at Table IV-2, the quantity of shipments of subject imports from Brazil going to secondary aluminum producers during the POI was sufficient to indicate its meaningful participation in this channel, as reflected in the Commission's pricing data for Product 2 (sales to secondary aluminum producers). *See* CR/PR at Table V-4.

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

[74] ***Response to Lost Sales Lost Revenue Survey (EDIS Document No. 606677).

[75] *** Responses to Lost Sales Lost Revenue Survey (EDIS Document Nos. 606679, 606683, and 606687). *** also reported a *** quantity of purchases of subject imports from ***. (EDIS Document No. 606683).

[76] CR/PR at Table V-4.

[77] CR/PR at Table II-2; CR at IV-18; PR at IV-8.

[78] CR at III-9; PR at III-4.

[79] CR/PR at Table IV-7.

[80] In any final phase investigations we will examine further the arguments by respondents that subject imports from Brazil are not fungible with imports from other subject sources and the domestic like product because they can meet chemical standards required for certain applications, particularly low levels of boron and other impurities, that suppliers from other sources cannot meet.

product and subject imports from all sources compete head-to-head for sales to secondary aluminum producers. The domestic like product and subject imports from Australia, Brazil, Kazakhstan, and Norway also share overlapping channels of distribution. The domestic like product and subject imports from all four subject countries were simultaneously present in the U.S. market in 2015 and 2016, and are sold in multiple overlapping U.S. regions, including the Northeast, Midwest, Southeast, and Pacific Coast regions of the United States. Consequently, the record indicates that there is a reasonable overlap of competition between and among subject imports and the domestic like product. We accordingly analyze subject imports from Australia, Brazil, Kazakhstan, and Norway on a cumulated basis for our analysis of whether there is a reasonable indication of material injury by reason of subject imports.

VII. Reasonable Indication of Material Injury by Reason of Subject Imports

A. Legal Standard

In the preliminary phase of antidumping and countervailing duty investigations, 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.[81] 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.[82] The statute defines "material injury" as "harm which is not inconsequential, immaterial, or unimportant."[83] 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.[84] 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."[85]

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 traded imports,[86] it does not define the phrase "by reason of," indicating that this aspect of the

[81] 19 U.S.C. §§ 1671b(a), 1673b(a). The Trade Preferences Extension Act of 2015, Pub. L. 114-27, amended the provisions of the Tariff Act pertaining to Commission determinations of reasonable indication of material injury and threat of material injury by reason of subject imports in certain respects. We have applied these amendments here.

[82] 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).

[83] 19 U.S.C. § 1677(7)(A).

[84] 19 U.S.C. § 1677(7)(C)(iii).

[85] 19 U.S.C. § 1677(7)(C)(iii).

[86] 19 U.S.C. §§ 1671b(a), 1673b(a).

injury analysis is left to the Commission's reasonable exercise of its discretion.[87] 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.[88]

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.[89] In performing its examination, however, the Commission need not isolate the injury caused by other factors from injury caused by unfairly traded imports.[90] Nor does

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[87] *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).

[88] 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).

[89] 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.

[90] 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 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

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the "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.[91] It is clear that the existence of injury caused by other factors does not compel a negative determination.[92]

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."[93] [94] Indeed, the Federal Circuit has examined and affirmed various Commission methodologies and has disavowed "rigid adherence to a specific formula."[95]

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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.").

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

[92] *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.").

[93] *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 v. United States*, 793 F.3d 1355 (Fed. Cir. 2015), the Federal Circuit affirmed the Commission's causation analysis as comporting with the Court's guidance in *Mittal*.

[94] Commissioner Kieff 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 analyzing present material injury, to consider a particular issue with respect to the role of nonsubject imports, without reliance upon presumptions or rigid formulas. The Court has not prescribed a specific method of exposition for this consideration. *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 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.

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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.[96] 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.[97] 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.[98]

(…Continued)

> 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.

[95] *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.").

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

[97] *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).

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

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.[99] Congress has delegated this factual finding to the Commission because of the agency's institutional expertise in resolving injury issues.[100]

B. Conditions of Competition and the Business Cycle

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

1. Captive Production

We consider the applicability of the statutory captive production provision[101] in the context of transfers from ***.[102]

In its U.S. producers' questionnaire response, *** reported transfers to related firms of *** short tons of silicon metal in 2014, *** short tons in 2015, and *** short tons in 2016.[103] As a percentage of total production by U.S. producers included in the domestic industry, these transfers by *** to related firms constituted *** percent of domestic production in 2014, ***

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[99] We provide in our discussion below a full analysis of other factors alleged to have caused any material injury experienced by the domestic industry.

[100] *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.").

[101] The captive production provision, 19 U.S.C. § 1677(7)(C)(iv), as amended by the Trade Preferences Extension Act of 2015, provides:

(iv) CAPTIVE PRODUCTION – If domestic producers internally transfer significant production of the domestic like product for the production of a downstream article and sell significant production of the domestic like product in the merchant market, and the Commission finds that-

> (I) the domestic like product produced that is internally transferred for processing into that downstream article does not enter the merchant market for the domestic like product, and
>
> (II) the domestic like product is the predominant material input in the production of that downstream article.

The SAA indicates that where a domestic like product is transferred internally for the production of another article coming within the definition of the domestic like product, such transfers do not constitute internal transfers for the production of a "downstream article" for purposes of the captive production provision. SAA at 853.

[102] We note that there is no captive production issue regarding transfers from *** because, for purposes of our preliminary determinations, DC Alabama has been excluded from the domestic industry as a related party.

[103] ***.

percent in 2015, and *** percent in 2016.[104] *** indicated that the transfers to related firms reported in its questionnaire response were ***. *** further indicated that ***.[105]

The record does not contain sufficient information to determine whether the threshold criterion for application of the captive production provision has been met, in particular whether the *** constitute material that is "internally transfer{red}" within the meaning of the statute, as opposed to constituting "sales" that would be outside the ambit of the statutory provision.[106] The record also does not contain sufficient information to determine whether the second statutory criterion is satisfied with respect to these transfers. Accordingly, the record does not provide a sufficient basis for the Commission to apply the captive production provision in these preliminary determinations.[107]

2. Demand Conditions

U.S. demand for silicon metal is driven by demand for the end uses in which it is used as an input. Silicon metal is used by chemical producers, primary aluminum producers, and secondary aluminum producers. Chemical producers use silicon metal to produce silicones, as well as to produce high purity forms of silicon such as polysilicon. Primary and secondary aluminum producers use silicon metal as an alloying agent, and their end uses include aluminum alloys, aluminum castings and foundry ingots.[108]

Most responding firms reported that U.S. demand for silicon metal decreased or fluctuated during the POI.[109] Apparent U.S. consumption declined by *** percent from 2014 to 2016. It declined from *** short tons in 2014 to *** short tons in 2015, and then increased *** to *** short tons in 2016.[110]

3. Supply Conditions

There were four sources of supply to the U.S. market during the POI: the domestic industry, the U.S. producer we have excluded from the domestic industry (DC Alabama), subject imports, and nonsubject imports.

The domestic industry consists of two U.S. producers, Globe and Mississippi Silicon. Mississippi Silicon opened a new production facility in Burnsville, MS and began production on

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[104] *See* CR/PR at Table C-2. The percentage of production by U.S. producers included in the domestic industry that went to the merchant market was *** percent in 2014, *** percent in 2015, and *** percent in 2016. *See* CR/PR at Tables III-6, C-2.

[105] EDIS Document No. 608839.

[106] *See Bethlehem Steel Corp. v. United States,* 294 F. Supp. 1359, 1365-67 (Ct. Int'l Trade 2003).

[107] To the extent that parties are interested in the Commission pursuing this issue in any final phase of these investigations, they should indicate in their comments on the draft questionnaires how the Commission should collect the pertinent data to enable it to make the necessary determinations as to the applicability of the provision.

[108] CR at II-1, II-10; PR at II-1, II-5.

[109] CR at II-11 to II-12; PR at II-6; CR/PR at Table II-4.

[110] CR/PR at Tables IV-8, C-2.

September 30, 2015.[111] Globe closed its plant in Selma, Alabama in February 2016, and reported idling furnaces in two plants during the POI.[112] Globe also reported converting a furnace in one of its plants from producing silicon metal to ferrosilicon.[113] The domestic industry's market share increased from *** percent in 2014 to *** percent in 2015, and then to *** percent in 2016.[114] The domestic industry's production capacity was *** than apparent U.S. consumption throughout the POI.[115]

The market share of DC Alabama was *** percent in 2014, *** percent in 2015, and *** percent in 2016.[116]

The market share of cumulated subject imports declined from *** percent in 2014 to *** percent in 2015, and then increased to *** percent in 2016.[117] During the POI, subject Brazilian producers faced disruptions in their production because of an energy crisis and electricity shortage in Brazil, and two Brazilian producers, LIASA and MINASLIGAS, ceased production temporarily.[118]

The market share of nonsubject imports was *** percent in 2014, *** percent in 2015, and *** percent in 2016.[119] The largest source of nonsubject imports during the POI was South Africa, followed by Canada.[120] Imports of silicon metal from Russia and China are currently subject to U.S. antidumping duty orders.[121]

In late 2015, Globe Specialty Metals, Inc. merged with the Spanish firm Grupo FerroAtlántica to form Ferroglobe PLC, a producer of silicon metal and silicon-based alloys with the largest collective silicon metal production capacity in the world.[122] Ferroglobe has affiliated nonsubject suppliers to the U.S. market in South Africa, Canada, France, and Spain.[123]

4. Substitutability and Other Conditions

The record indicates that there is a high degree of substitutability between domestically produced silicon metal and the subject imports.[124] The record also indicates that price is an important factor in purchasing decisions for silicon metal. Purchasers responding to the

[111] CR/PR at Table III-3.

[112] Conf. Tr. at 22 (Perkins); 29 (Huck); CR/PR at Table III-3; CR at VI-9; PR at VI-2.

[113] Conf. Tr. at 29, 40-41 (Huck). Globe reported that it is easier to switch production from silicon metal to ferrosilicon than the reverse. Conf. Tr. at 41 (Perkins); CR at II-7; PR at II-3.

[114] CR/PR at Table C-2.

[115] In 2016, the domestic industry's capacity was *** short tons, while apparent U.S. consumption was *** short tons. CR/PR at Table C-2.

[116] CR/PR at Table C-2.

[117] CR/PR at Tables IV-9, C-2.

[118] Conf. Tr. at 91 (Augusto); CR at VII-11 n.5; PR at VII-7 n.5.

[119] CR/PR at Tables IV-9, C-2.

[120] CR at II-9; PR at II-5.

[121] *See* CR at I-6 to I-13; PR at I-4 to I-9.

[122] CR at VII-40; PR at VII-25.

[123] CR at VII-40, VII-43; PR at VII-25, VII-28; see ***.

[124] CR at II-13; PR at II-7.

Commission's lost sales and lost revenue allegations listed price as one of the most important factors in their purchasing decisions, along with quality and availability/reliability of supply.[125]

Silicon metal is primarily sold domestically in lump form, but may be also sold in powder form. While powder form is primarily used by chemical manufacturers, they may choose to purchase silicon metal in lump form and process it themselves into powder form.[126] The *** of U.S. producers' U.S. shipments were in lump form. U.S. importers of subject imports from *** reported that they primarily shipped silicon metal in lump form, while U.S. importers of subject imports from *** reported that they primarily shipped silicon metal in powder form.[127]

The principal raw materials for producing silicon metal include quartz with a high percentage of silica and low iron content, charcoal or woodchips, and electrodes. Electricity is a large cost item in silicon metal production.[128] The record indicates that silicon metal prices are generally not driven by raw material prices.[129]

U.S. producers reported selling the vast majority of their production under contracts of varying duration, primarily ***, while most importers reported selling subject merchandise primarily under annual contracts.[130] Contract prices are sometimes determined based on a formula that accounts for data from published price indexes, which are readily available to purchasers. While these published indexes primarily reflect product sold to secondary aluminum producers, the data are referenced by purchasers of silicon metal for all end uses.[131]

According to Globe, silicon metal production is highly capital intensive with high fixed costs, and it is essential to run production facilities at a very high rate of capacity utilization to be profitable.[132] Domestically produced silicon metal is primarily produced-to-order, while subject imports are primarily shipped from U.S. inventories.[133]

U.S. producers reported inland transportation costs of 2 to 3 percent, while importers reported costs of 1 to 4 percent.[134] Respondents argue that high U.S. freight costs generally give U.S. producers a cost advantage over subject imports, given the importance of just-in-time delivery to many silicon metal purchasers. Importer and end user REC, however, stated that the location of its production facilities in the Northwest makes transportation costs cheaper for imported product on the West Coast than for domestically produced product shipped from the eastern or southern United States. [135]

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

[126] CR at II-1, III-10; PR at II-1, III-4; Conf. Tr. at 43-44 (Perkins, Lutz).

[127] CR/PR at Tables III-8, IV-4, IV-5; CR at II-1 n.1, III-10; PR at II-1 n.1, III-4.

[128] CR at V-1 to V-2; PR at V-1. The quality of the raw materials used generally determines the quality of the silicon metal produced. CR at II-14 to II-15, V-1; PR at II-8, V-1.

[129] CR at V-I; PR at V-1; Conf. Tr. at 54 (Perkins).

[130] CR/PR at Table V-2; CR at V-4 to V-5; PR at V-2 to V-3.

[131] CR at V-3; PR at V-2; Conf. Tr. at 20 (Perkins); 92 (Augusto).

[132] Conf. Tr. at 28 (Huck).

[133] CR at II-13; PR at II-7.

[134] CR at V-2; PR at V-1.

[135] CR at V-2; PR at V-2.

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."[136]

The volume of cumulated subject imports declined by 5.8 percent over the POI, declining from 118,455 short tons in 2014 to 91,340 short tons in 2015, and then increasing to 111,564 short tons in 2016.[137] Cumulated subject imports as a share of apparent U.S. consumption declined from *** percent in 2014 to *** percent in 2015, and then increased to *** percent in 2016.[138]

We conclude that the volume of cumulated subject imports is significant both in absolute terms and relative to consumption in the United States.

D. Price Effects of the 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.[139]

As addressed in section IV.B.4 above, the record indicates that the domestic like product and subject imports are highly substitutable and that price is an important factor in purchasing decisions.

Both U.S. producers in the domestic industry and seven importers of subject merchandise provided usable quarterly data on the total quantity and f.o.b. value of their U.S. shipments of three silicon metal products sold to unrelated customers during the POI, although not all firms reported pricing for all products for all quarters.[140] Reported pricing data

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[136] 19 U.S.C. § 1677(7)(C)(i).

[137] CR/PR at Table C-2.

[138] CR/PR at Tables IV-9, C-2.

[139] 19 U.S.C. § 1677(7)(C)(ii).

[140] CR at V-6; PR at V-4. The three pricing products are:

Product 1.-- *Sold to primary aluminum producers*; silicon metal less than 99.99% pure that contains a minimum of 98.5% silicon, a maximum of 1.00% iron, a maximum of 0.07% calcium, and no restriction of the aluminum content.

Product 2.-- *Sold to secondary aluminum producers*; silicon metal less than 99.99% pure that contains a minimum of 97.0% silicon, a maximum of 2.00% iron, a maximum of 0.4% calcium, and no restriction of the aluminum content.

(Continued…)

accounted for approximately 96 percent of the domestic industry's U.S. commercial shipments of silicon metal in 2016, and approximately *** percent of U.S. shipments of subject imports from Australia, *** percent of U.S. shipments of subject imports from Brazil, virtually all U.S. shipments of subject imports from Kazakhstan, and *** percent of U.S. shipments of subject imports from Norway in 2016.[141]

Cumulated subject imports undersold the domestic like product in 51 out of 75 quarterly comparisons, at margins ranging between 0.1 percent and 40.7 percent, and an average margin of underselling of 8.0 percent.[142] By volume there was also predominant underselling, with *** short tons of subject imports associated with instances of underselling, as compared to *** short tons of subject imports associated with instances of overselling. Thus, *** percent of the volume of subject imports covered by the Commission's pricing data was sold during quarters in which the average price of these imports was less than that of the comparable domestic product.[143] As the volume of cumulated subject imports increased from 2015 to 2016, the margins of underselling by subject imports increased significantly in 2016 for certain imports.[144] Given the high degree of substitutability between subject imports and the domestic like product and the importance of price in purchasing decisions, we find the underselling by subject imports to be significant.

Prices declined during the POI for both subject imports and the domestic like product.[145] Declines in subject import prices for the three pricing products ranged from *** percent to *** percent during the POI, while the domestic industry's prices declined *** percent for Product 1, *** percent for Product 2, and *** percent for Product 3.[146] U.S. producers' prices for each of the three pricing products *** in 2016, with prices for Product 1 *** in the third quarter of 2016, and prices for Products 2 and 3 ***.[147]

The decline in the domestic industry's prices during 2016 corresponds with the significant volume of subject imports that year that undersold the domestic producers'

(…Continued)

Product 3.-- *Sold to chemical manufacturers*; silicon metal less than 99.99% pure that contains a minimum of 98.0% silicon, a maximum of 1.50% iron, a maximum of 0.2% calcium, and a maximum of 0.4% aluminum.

Id.

[141] CR at V-7; PR at V-4.

[142] CR/PR at Table V-7.

[143] CR/PR at Table V-7.

[144] The margins of underselling by subject imports increased significantly in 2016 for imports of Product 1 from *** and imports of Product 2 from ***, while *** of imports of Product 2 *** underselling domestic product also increased in 2016. CR/PR at Tables V-3 to V-4. We note that that the Commission's pricing data with respect to Product 3 show predominant overselling of the domestic like product by subject imports in 2015 and 2016. CR/PR at Table V-5. Data with respect to direct purchases of imports of Product 3 show that prices of subject imports were higher than prices of the domestic like product for most quarterly comparisons in 2016. CR/PR at Table V-8.

[145] CR at V-13; PR at V-6.

[146] CR/PR at Table V-6.

[147] CR/PR at Tables V-3 through V-5.

prices.[148] The price declines in 2016 are not explained by any change in apparent U.S. consumption, which was *** between 2015 and 2016,[149] nor are they explained by raw material costs, which do not drive silicon metal prices.[150] Additionally, nonsubject imports declined *** in volume and market share between 2015 and 2016[151] and generally were sold at higher prices than subject imports.[152] We have also considered respondents' argument that intra-industry competition between Globe and the new domestic producer Mississippi Silicon drove domestic producers' prices down.[153] While the entry of Mississippi Silicon into the market in 2015 may have been a source of pricing pressure on Globe, this does not negate the pricing pressure on the domestic industry as a whole from subject imports, which undersold the domestic like product on an industry-wide basis.[154] Consequently, we find that on this preliminary record the cumulated subject imports depressed prices of the domestic like product to a significant degree.[155]

We therefore find that the cumulated subject imports had significant price effects.

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[148] As previously discussed, the volume of cumulated subject imports increased by 22.1 percent between 2015 and 2016. CR/PR at Table C-2.

[149] Apparent U.S. consumption increased by *** percent between 2015 and 2016.

[150] CR at V-I; PR at V-1; Conf. Tr. at 54 (Perkins).

[151] The volume of nonsubject imports declined by 37.7 percent between 2015 and 2016, while the market share of nonsubject imports declined by *** percentage points from *** percent in 2015 to *** percent in 2016. CR/PR at Table C-2.

[152] The largest source of nonsubject imports during the POI was South Africa. CR at II-9; PR at II-5. The Commission collected pricing data with respect to nonsubject imports from South Africa, with *** of silicon metal from South Africa reporting pricing data that accounted for *** percent of U.S. commercial shipments of nonsubject imports from South Africa during the POI. CR/PR at E-3. Nonsubject imports from South Africa were priced lower than the domestic like product in 20 quarterly comparisons and higher in 13 quarterly comparisons. Nonsubject imports from South Africa were priced lower than subject imports in 9 quarterly comparisons and higher in 24 quarterly comparisons. CR/PR at Table E-4.

[153] *See* Joint Respondents' Postconference Brief at 32-34, Dow's Postconference Brief at 16-17.

[154] CR/PR at Table V-7.

[155] The Commission received responses to its lost sales and lost revenue survey from six purchasers identified by ***, as well as three additional purchasers that submitted survey responses without being first contacted by Commission staff. Five purchasers reported increasing purchases from domestic producers, three reported decreasing purchases, and one reported fluctuating purchases. Eight of the nine responding purchasers reported that since 2014 they had purchased imported silicon metal from subject countries instead of domestically produced product. Four of these purchasers reported that price was a primary reason for the decision to produce subject imports rather than domestically produced product. Five purchasers reported that they shifted from domestically produced product to subject imports because domestic producers were unable to satisfy their supply needs. None of the responding purchasers reported that U.S. producers had reduced their prices in response to subject imports. CR at V-20 to V-26; PR at V-9 to V-11.

E. Impact of the Subject Imports[156]

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."[157]

With the entry of new U.S. producer Mississippi Silicon in 2015, the domestic industry experienced increases in capacity, production, shipments, net sales quantity, market share, and most employment indicators during the POI. However, the industry experienced a sharp decline in revenues and financial performance between 2015 and 2016.[158]

The domestic industry's capacity increased by *** percent during the POI, increasing from *** short tons in 2014 to *** short tons in 2015 and then to *** short tons in 2016.[159] Production increased by *** percent during the POI, increasing from *** short tons in 2014 to *** short tons in 2015 and then to *** short tons in 2016.[160] Capacity utilization declined from *** percent in 2014 to *** percent in 2015, and then increased to *** percent in 2016.[161]

Net sales quantity increased by *** percent during the POI, declining from *** short tons in 2014 to *** short tons in 2015, and then increasing to *** short tons in 2016.[162] U.S. shipments increased by *** percent during the POI, declining from *** short tons in 2014 to *** short tons in 2015, and then increasing to *** short tons in 2016.[163] The domestic industry's share of apparent U.S. consumption increased from *** percent in 2014 to *** percent in 2015, and then to *** percent in 2016.[164] Ending inventories of producers in the domestic industry increased by *** percent during the POI, increasing from *** short tons in 2014 to *** short tons in 2015, and then declining to *** short tons in 2016.[165]

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[156] In its notice initiating the antidumping duty investigations on silicon metal from Australia, Brazil, and Norway, Commerce reported estimated dumping margins of 28.58 percent to 52.81 percent for imports from Australia, 15.41 percent to 134.92 percent for imports from Brazil, and 32.25 percent to 45.66 percent for imports from Norway. *Silicon Metal from Australia, Brazil, and Norway: Initiation of Less-Than-Fair-Value Investigations,* 82 Fed. Reg. 16352, 16355 (Apr. 4, 2017).

[157] 19 U.S.C. § 1677(7)(C)(iii). This provision was amended by the Trade Preferences Extension Act of 2015, Pub. L. 114-27.

[158] CR/PR at Table C-2.

[159] CR/PR at Table C-2.

[160] CR/PR at Table C-2.

[161] CR/PR at Table C-2.

[162] CR/PR at Table C-2.

[163] CR/PR at Table C-2.

[164] CR/PR at Table C-2.

[165] CR/PR at Table C-2.

Employment indicators generally increased during the POI, but productivity declined. Employment increased by *** percent during the POI, increasing from *** production-related workers (PRWs) in 2014 to *** PRWs in 2015 and then declining to *** PRWs in 2016.[166] Hours worked increased by *** percent during the POI, increasing from *** hours in 2014 to *** hours in 2015, and then increasing to *** hours in 2015.[167] Wages paid increased by *** percent during the POI, increasing from $*** in 2014 to $*** in 2015, and then declining to $*** in 2016.[168] Productivity declined by *** percent during the POI, declining (in short tons per thousand hours) from *** in 2014 to *** in 2015 and *** in 2016.[169]

In contrast to output and employment, the domestic industry's financial indicators declined. Its revenues declined by *** percent during the POI, falling from $*** in 2014 to $*** in 2015, and then to $*** in 2016.[170] Total cost of goods sold (COGS) increased by *** percent during the POI, increasing from $*** in 2014 to $*** in 2015 and then to $*** in 2016.[171] The industry's ratio of COGS to net sales increased from *** percent in 2014 to *** percent in 2015 and then to *** percent in 2016.[172] Indicia of profitability declined each year during the POI, and by 2016 the domestic industry experienced *** gross profit, operating income, and net income. The industry's gross profit declined from $*** in 2014 to $*** in 2015, followed by *** of $*** in 2016.[173] The industry's operating income declined from $*** in 2014 to $*** in 2015, followed by *** of $*** in 2016.[174] The industry's operating income margin followed a similar trend; it was *** percent in 2014, *** percent in 2015 and *** percent in 2016.[175] The industry's net income declined from $*** in 2014 to $*** in 2015, followed by *** of $*** in 2016.[176] Capital expenditures increased from $***in 2014 to $*** in 2015, and then declined to $*** in 2016.[177]

The depressed prices the domestic industry experienced in 2016 due to the significant volume of low-priced subject imports resulted in declining revenues. The decline in the domestic industry's revenues caused by subject imports in turn led to a financial performance in 2016 (including an operating *** of $***) that was worse than it would have been otherwise in a year when demand was fairly stable and output rose.[178]

In our analysis of the impact of subject imports on the domestic industry, we have taken into account whether there are other factors that may have had an adverse impact during the

[166] CR/PR at Table C-2.
[167] CR/PR at Table C-2.
[168] CR/PR at Table C-2.
[169] CR/PR at Table C-2.
[170] CR/PR at Table C-2.
[171] CR/PR at Table C-2.
[172] CR/PR at Table C-2.
[173] CR/PR at Table C-2.
[174] CR/PR at Table C-2.
[175] CR/PR at Table C-2.
[176] CR/PR at Table C-2.
[177] CR/PR at Table VI-4. The domestic industry incurred *** research and development expenses during the POI. CR/PR at Table VI-4.
[178] CR/PR at Table C-2.

POI to ensure that we are not attributing injury from other factors to the subject imports, including the role of nonsubject imports. The market share of nonsubject imports declined over the POI, including a *** percentage point decline from 2015 to 2016.[179] Moreover, the pricing data collected by the Commission indicate that nonsubject imports from South Africa were priced higher than subject imports in a majority of quarterly comparisons.[180] Thus, nonsubject imports do not explain the depression in U.S. producers' prices and the consequent decline in the domestic industry's revenues and financial performance in 2016. Accordingly, we find that subject imports had injurious effects on the domestic industry distinct from any effects from imports from other sources. As previously discussed, we also find that intra-industry competition between Globe and Mississippi Silicon does not explain the significant underselling of the domestic industry by subject imports, and thus does not explain the depression in U.S. producers' prices in 2016 and the decline in the domestic industry's revenues and financial performance.

Finally, we observe that some market participants have stressed the importance of having multiple, diverse, and reliable sources of supply of silicon metal, and have asserted that concerns about Globe's ability to fully and reliably meet their supply needs, particularly in light of its merger with FerroAtlántica, have led to increased purchases of subject imports.[181] We note, however, that the entry of Mississippi Silicon as a U.S. producer in 2015 added to the diversity of supply in the U.S. market, and that the domestic industry's U.S. shipments, net sales quantity, and market share increased over the POI, including from 2015 to 2016 as Mississippi Silicon entered the market.[182] Thus, interest by U.S. purchasers in multiple sources of supply does not explain the depressed prices and reduced revenues and profitability the domestic industry experienced in 2016 while a significant and increasing volume of subject imports undersold the domestic like product.

We therefore conclude, for purposes of these preliminary phase investigations, that the cumulated subject imports have had a significant impact on the domestic industry.

[179] The market share of nonsubject imports was *** percent in 2014, *** percent in 2015, and *** percent in 2016. CR/PR at Tables IV-9, C-2.

[180] As previously discussed, the largest source of nonsubject imports during the POI was South Africa. CR at II-9; PR at II-5. The Commission collected pricing data with respect to nonsubject imports from South Africa, with *** of silicon metal from South Africa reporting pricing data that accounted for *** percent of U.S. commercial shipments of nonsubject imports from South Africa during the POI. CR/PR at E-3. The pricing data showed that nonsubject imports from South Africa were priced lower than the domestic like product in 20 quarterly comparisons and higher in 13 quarterly comparisons. With respect to subject imports, the pricing data showed that nonsubject imports from South Africa were priced lower than subject imports in 9 quarterly comparisons and higher in 24 quarterly comparisons. CR/PR at Table E-4.

[181] CR at II-16 to II-17; PR at II-9.

[182] CR/PR at Table C-2.

VIII. Conclusion

For the reasons stated above, we determine that there is a reasonable indication that an industry in the United States is materially injured by reason of subject imports of silicon metal from Australia, Brazil, and Norway that are allegedly sold in the United States at less than fair value and subject imports that are allegedly subsidized by the governments of Australia, Brazil, and Kazakhstan.

PART I: INTRODUCTION

BACKGROUND

These investigations result from petitions filed with the U.S. Department of Commerce ("Commerce") and the U.S. International Trade Commission ("USITC" or "Commission") by Globe Specialty Metals, Inc. ("GSM"), Beverly, Ohio, on March 8, 2017, alleging that an industry in the United States is materially injured and threatened with material injury by reason of subsidized silicon metal[1] from Australia, Brazil, and Kazakhstan and less-than-fair-value ("LTFV") imports of silicon metal from Australia, Brazil, and Norway. The following tabulation provides information relating to the background of these investigations.[2] [3]

Effective date	Action
March 8, 2017	Petitions filed with Commerce and the Commission; institution of Commission investigation (82 FR 13653, March 14, 2017)
March 28, 2017	Commerce's notice of initiation of antidumping duty investigations (82 FR 16352, April 4, 2017) and countervailing duty investigations (82 FR 16356, April 4, 2017)
March 29, 2017	Commission's conference
April 21, 2017	Commission's vote
April 24, 2017	Commission's determination
May 1, 2017	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--

[1] See the section entitled "The Subject Merchandise" in *Part I* of this report for a complete description of the merchandise subject in this proceeding.

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

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

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--[4]

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, gross profits, operating profits, net profits, ability to service debt, productivity, return on investments, return on assets, 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.

In addition, Section 771(7)(J) of the Act (19 U.S.C. § 1677(7)(J)) provides that—[5]

[4] Amended by PL 114-27 (as signed, June 29, 2015), Trade Preferences Extension Act of 2015.
[5] Amended by PL 114-27 (as signed, June 29, 2015), Trade Preferences Extension Act of 2015.

(J) EFFECT OF PROFITABILITY.—The Commission may not determine that there is no material injury or threat of material injury to an industry in the United States merely because that industry is profitable or because the performance of that industry has recently improved.

Organization of report

Part I of this report presents information on the subject merchandise, alleged subsidy and 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

Silicon metal is composed almost exclusively of elemental silicon with a small amount of impurities such as iron, calcium, and aluminum.[6] It is generally used as an alloying agent in aluminum production and by the chemical industry as an input in the production of silicones and polysilicon. Silicon metal is also used in die castings as well as copper, magnesium, and steel production.[7] The leading U.S. producer of silicon metal is ***, which responded to the Commission's questionnaire in this proceeding. The other known U.S. producers, which include ***, responded to the Commission's questionnaire.

Leading producers of silicon metal outside the United States include *** of Australia, *** of Brazil, *** of Kazakhstan, and *** of Norway.

The leading U.S. importer of silicon metal from Australia includes ***. The leading importers of silicon metal from Brazil include ***. The leading importer of silicon metal from Kazakhstan includes ***. The leading importers of silicon metal from Norway include ***. Leading importers of silicon metal from nonsubject nountries (primarily Canada, South Africa, and Thailand) include ***. Purchasers of silicon metal include primary and secondary aluminum producers and silicon-based chemical producers. Leading purchasers, in order of size, include ***.

Apparent U.S. consumption of silicon metal totaled approximately *** short tons contained silicon[8] ($***) in 2016. Currently, three firms are known to produce silicon metal in

[6] Conference transcript, pp. 10 (Kramer), 18 (Perkins).

[7] Petition, Vol. I, pp. 6-7; conference transcript, pp. 30-31 (Lutz).

[8] In general, quantities of silicon metal in this report are stated in terms of contained weight rather than gross weight. For example, 50,000 short tons of silicon metal with a 98 percent silicon content

(*continued*...)

the United States. U.S. producers' U.S. shipments of silicon metal totaled *** short tons contained silicon ($***) in 2016, and accounted for *** percent of apparent U.S. consumption by quantity and *** percent by value. U.S. imports from subject sources totaled 111,564 short tons contained silicon ($240.7 million) in 2016 and accounted for *** percent of apparent U.S. consumption by quantity and *** percent by value. U.S. imports from nonsubject sources totaled 55,090 short tons contained silicon ($126.8 million) in 2016 and accounted for *** percent of apparent U.S. consumption by quantity and *** percent by value.

SUMMARY DATA AND DATA SOURCES

A summary of data collected in these investigations is presented in appendix C, table C-1.[9] Except as noted, U.S. industry data are based on questionnaire responses of three firms. Staff believes these firms account for virtually all U.S. production of silicon metal during 2016. U.S. imports are based on official import statistics[10] and on questionnaire responses from 15 U.S. importers that are believed to account for virtually all subject imports from Australia, virtually all subject imports from Brazil, 96.6 percent from Kazakhstan, 96.4 percent from Norway, and 96.5 percent from nonsubject sources in 2016. Foreign industry data are based on questionnaire responses of one firm in Australia whose exports accounted for *** U.S. imports of silicon metal, four firms firms in Brazil whose exports accounted for *** U.S. imports of silicon metal, two firms firms in Kazakhstan whose exports accounted for *** of U.S. imports of silicon metal, and two firms in Norway whose exports accounted for *** U.S. imports of silicon metal in 2016.

PREVIOUS AND RELATED INVESTIGATIONS

Silicon metal from Argentina, Brazil, and China

The Commission has conducted investigations and related five-year reviews on silicon metal with respect to Argentina, Brazil, and China. On August 24, 1990, a petition was filed with Commerce and the Commission alleging that an industry in the United States was materially injured by reason of imports of silicon metal from Argentina, Brazil, and China that were sold at LTFV and imports from Brazil that were subsidized by the government of Brazil.[11] Commerce

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(…*continued*)
would be described as 49,000 short tons of silicon metal. Under the scope of this proceeding, silicon metal contains at least 85.00 percent but less than 99.99 percent silicon, and less than 4.00 percent iron, by actual weight. Petition, Vol. I, p. 1, n.2.

[9] As *** are presented in table C-2.

[10] Official import statistics are based on General Imports using statistical reporting numbers 2804.69.1000 and 2804.69.5000, which measures the total physical arrivals of merchandise from foreign countries, whether such merchandise enters the U.S. customs territory immediately or is entered into bonded warehouses or free trade zones ("FTZs") under Customs custody.

[11] The petition was filed by American Alloys, Inc. ("American Alloys"); Elkem Metals Co., L.P. ("Elkem"); Silicon Metaltech, Inc.; SiMETCO, Inc.; and SKW Alloys, Inc. ("SKW"). *Silicon Metal from*
(*continued*...)

made a final negative determination with respect to the countervailing duty investigation regarding imports of silicon metal from Brazil[12] and final affirmative determinations with respect to the antidumping duty investigations regarding imports of silicon metal from Argentina,[13] Brazil,[14] and China.[15] In addition, the Commission made final affirmative injury determinations with respect to all three countries in 1991.[16] Thereafter, Commerce issued antidumping duty orders on silicon metal from Argentina,[17] Brazil,[18] and China.[19]

On November 2, 1999, the Commission instituted the first five-year reviews of the antidumping duty orders on imports of silicon metal from Argentina, Brazil, and China.[20] In February 2001, the Commission completed its full first five-year reviews and determined that revocation of the antidumping duty order on silicon metal from Argentina would not be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time. The Commission further determined that revocation of the antidumping duty orders on silicon metal from Brazil and China would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.[21] Following affirmative determinations on imports of silicon metal from Brazil and China in the first five-year reviews by Commerce and the Commission,[22]

(…*continued*)
Argentina, Brazil, and the People's Republic of China: Investigation Nos. 731-TA-470-472 (Preliminary), USITC Publication 2325, October 1990, p. I-1.

[12] *Final Negative Countervailing Duty Determination: Silicon Metal From Brazil*, 56 FR 26988, June 12, 1991.

[13] *Final Determination of Sales at Less Than Fair Value: Silicon Metal From Argentina*, 56 FR 37891, August 9, 1991.

[14] *Final Determination of Sales at Less Than Fair Value: Silicon Metal From* Brazil, 56 FR 26977, June 12, 1991.

[15] *Final Determination of Sales at Less Than Fair Value: Silicon Metal From the People's Republic of* China, 56 FR 18570, April 23, 1991.

[16] *Determination; Silicon Metal From Argentina Investigation No. 731-TA-470 (Final)*, 56 FR 48577, September 25, 1991; *Determination, Silicon Metal From* Brazil, 56 FR 37572, August 7, 1991; *Determination; Silicon Metal From the People's Republic of* China, 56 FR 27033, June 12, 1991.

[17] *Antidumping Duty Order: Silicon Metal From Argentina*, 56 FR 48779, September 26, 1991.

[18] *Antidumping Duty Order: Silicon Metal From* Brazil, 56 FR 36135, July 31, 1991.

[19] *Antidumping Duty Order: Silicon Metal From the People's Republic of* China, 56 FR 26649, June 10, 1991.

[20] *Silicon Metal From Argentina, Brazil, and China and Silicomanganese From Brazil, China, and* Ukraine, 64 FR 59209, November 2, 1999.

[21] *Silicon Metal From Argentina, Brazil, and China: Investigations Nos. 731-TA-470-472 (Review)*, USITC Publication 3385, January 2001, p. 1. Commissioners Okun, Askey, and Devaney did not participate in the first five-year review concerning silicon metal from Argentina, Brazil, and China. Commissioner Bragg dissented with respect to the Commission's determination concerning Argentina.

[22] *Silicon Metal From Brazil; Final Results of Expedited Review of Antidumping Duty* Order, 65 FR 35607, June 5, 2000; *Silicon Metal From the People's Republic of China; Final Results of Expedited Sunset Review of Antidumping Duty* Order, 65 FR 35609, June 5, 2000; *Silicon Metal From Argentina, Brazil, and China*, 66 FR 8981, February 5, 2001.

Commerce issued a continuation of the antidumping duty orders on silicon metal from Brazil and China, effective February 16, 2001,[23] and revoked the antidumping duty order on silicon metal from Argentina, effective January 1, 2000.[24]

The Commission instituted its second five-year reviews of the antidumping duty orders on imports of silicon metal from Brazil and China on January 3, 2006.[25] The Commission completed its full second five-year reviews in December 2006, determining that revocation of the antidumping duty order on silicon metal from Brazil would not be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time but that revocation of the antidumping duty order on silicon metal from China would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.[26] Following affirmative determinations on imports of silicon metal from China in the second five-year reviews by Commerce and the Commission,[27] Commerce issued a continuation of the antidumping duty order on silicon metal from China, effective December 21, 2006,[28] and revoked the antidumping duty order on silicon metal from Brazil, effective February 16, 2006.[29]

The Commission's third five-year review of the antidumping duty order on imports of silicon metal from China was instituted on November 1, 2011.[30] The Commission completed its expedited third five-year review in March 2012, determining that revocation of the antidumping duty on China would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.[31] Following affirmative determinations in the third five-year review by Commerce and the Commission,[32]

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[23] *Continuation of Antidumping Duty Orders on Silicon Metal From Brazil and China and on Silicomanganese From Brazil and China, and Continuation of Suspended Antidumping Duty Investigation on Silicomanganese From Ukraine*, 66 FR 10669, February 16, 2001.

[24] *Revocation of Antidumping Duty Order: Silicon Metal From Argentina*, 66 FR 10669, February 16, 2001.

[25] *Silicon Metal From Brazil and* China, 71 FR 138, January 3, 2006.

[26] *Silicon Metal From Brazil and China: Investigation Nos. 731-TA-471 and 472 (Second Review)*, USITC Publication 3892, December 2006, p. 1.

[27] *Silicon Metal from the People's Republic of China and Brazil: Final Results of the Expedited Reviews of the Antidumping Duty Orders*, 71 FR 26334, May 4, 2006; *Silicon Metal From Brazil and China*, 71 FR 71554, December 11, 2006.

[28] *Silicon Metal from the People's Republic of China: Continuation of Antidumping Duty* Order, 71 FR 76636, December 21, 2006

[29] *Silicon Metal From Brazil: Revocation of Antidumping Duty* Order, 71 FR 76635, December 21, 2006.

[30] *Silicon Metal From China; Institution of a Five-Year Review Concerning the Antidumping Duty Order on Silicon Metal From China*, 76 FR 67476, November 1, 2011.

[31] *Silicon Metal From China: Investigation No. 731-TA-472 (Third Review)*, USITC Publication 4312, March 2012, p. 1.

[32] *Silicon Metal From the People's Republic of China: Final Results of the Expedited Third Sunset Review of the Antidumping Duty* Order, 77 FR 10477, February 22, 2012; *Silicon Metal From China*, 77 FR 20649, April 5, 2012.

Commerce issued a continuation of the antidumping duty order on silicon metal from China, effective April 20, 2012.[33]

The Commission's fourth five-year review of the antidumping order on imports of silicon metal from China was instituted on March 1, 2017.[34]

Silicon metal from Russia

On March 7, 2002, a petition was filed with Commerce and the Commission alleging that an industry in the United States was materially injured and threatened with further material injury by reason of LTFV imports of silicon metal from Russia.[35] On February 11, 2003, Commerce made an affirmative final LTFV determination regarding silicon metal from Russia.[36] The Commission completed its original investigation concerning silicon metal from Russia on March 19, 2003, determining that an industry in the United States was materially injured by reason of LTFV imports of silicon metal from Russia.[37] After receipt of the Commission's final determination, Commerce issued an antidumping duty order on imports of silicon metal from Russia.[38]

After the Commission determined that an industry in the United States was materially injured by reason of imports from Russia of silicon metal in March 2003,[39] respondents Bratsk Aluminum Smelter and Sual Trade Limited ("plaintiffs") appealed the Commission's determination to the U.S. Court of International Trade ("CIT"). On June 22, 2004, the CIT remanded the case to the Commission for further explanation, and on September 15, 2004, the Commission filed its affirmative remand determination with the CIT. On December 3, 2004, the CIT affirmed the Commission's remand determination in its entirety and dismissed the case.[40] Plaintiffs appealed the CIT's dismissal to the U.S. Court of Appeals for the Federal Circuit

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[33] *Silicon Metal From the People's Republic of China: Continuation of Antidumping Duty* Order, 77 FR 23660, April 20, 2012.

[34] *Silicon Metal From China; Institution of a Five-Year Review*, 82 FR 12234, March 1, 2017.

[35] The petition was filed by counsel on behalf of Globe, Cleveland, OH; SIMCALA, Inc. ("SIMCALA"), Mt. Meigs, AL; the International Union of Electronic, Electrical, Salaried, Machine and Furniture Workers (I.U.E.-C.W.A, AFL-CIO, C.L.C., Local 693), Selma, AL; the Paper, Allied-Industrial Chemical and Energy Workers International Union (Local 5-89), Boomer, WV; and the United Steel Workers of America (AFL-CIO, Local 9436), Niagara Falls, NY. *Silicon Metal From Russia: Investigation No. 731-TA-991 (Final)*, USITC Publication 3584, March 2003, p. I-1.

[36] *Notice of Final Determination of Sales at Less Than Fair Value: Silicon Metal From the Russian* Federation, 68 FR 6885, February 11, 2003 (as amended, *Notice of Amended Final Determination of Sales at Less Than Fair Value: Silicon Metal From the Russian* Federation, 68 FR 12037, March 13, 2003).

[37] *Silicon Metal From Russia*, 68 FR 14260, March 24, 2003; *Silicon Metal from Russia: Investigation No. 731-TA-991 (Final),* USITC Publication 3584, March 2003, p. I-1.

[38] *Antidumping Duty Order: Silicon Metal From* Russia, 68 FR 14578, March 26, 2003.

[39] *Silicon Metal from Russia: Investigation No. 731-TA-991 (Final)*, USITC Publication 3584, March 2003, p. 1. Chairman Okun did not participate in the investigation.

[40] Bratsk Aluminum Smelter v. United States, Slip Op. 04-153, CIT 2004, December 3, 2004.

("CAFC"). On April 10, 2006, the CAFC vacated and remanded the CIT's decision so that the CIT would remand the case back to the Commission to address nonsubject imports.[41] On May 25, 2006, the Commission submitted a petition for rehearing *en banc* before the CAFC and on July 24, 2006, the petition was denied. On July 28, 2006, the Commission petitioned the CAFC to stay issuance of the mandate to the CIT while the Commission, through the Office of the Solicitor General, considered the filing of a petition for *certiorari*. On August 7, 2006, the CAFC denied the motion to stay and remanded the case to the CIT. On August 17, 2006, the CIT remanded the case to the Commission. The Commission then filed a motion to stay the remand proceedings at the CIT pending a decision on whether to seek *certiorari*. On September 22, 2006, the CIT granted the stay. On December 20, 2006, the Commission informed the CIT that it would not be seeking certiorari at that time. On December 22, 2006, the CIT entered an order lifting the stay and instructed the Commission to submit its remand results to the CIT by March 22, 2007. Upon consideration of the CIT's remand order that the Commission comply with the CAFC's decision in Bratsk Aluminum Smelter v. United States, 444 F.3d 1369 (Fed. Cir. 2006), the Commission determined that an industry in the United States was materially injured by reason of imports of silicon metal from Russia that Commerce found to be sold at LTFV.[42] On January 15, 2008, the CIT issued an opinion affirming the Commission's affirmative remand determination that subject imports of silicon metal from Russia were causing material injury to the U.S. industry.[43] That decision was not appealed to the CAFC.

The Commission's first five-year review of the antidumping duty order on imports of silicon metal from Russia was instituted on February 1, 2008.[44] In June 2008, the Commission completed an expedited first five-year review of the subject order and determined that revocation of the antidumping duty order on silicon metal from Russia would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.[45] Following affirmative determinations in the first five-year review by Commerce and the Commission,[46] Commerce issued a continuation of the antidumping duty order on imports of silicon metal from Russia, effective July 16, 2008.[47]

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[41] Bratsk Aluminum Smelter v. United States, 444 F.3d 1369, 1375 (Fed. Cir. 2006).

[42] Commissioner Deanna Tanner Okun was recused from the investigation. Vice Chairman Aranoff and Commissioners Williamson and Pinkert did not participate in the original investigation or first remand determination, but participated in the second remand proceeding. *Silicon Metal from Russia: Investigation No. 731-TA-991 (Final) (Second Remand)*, USITC Publication 3910, March 2007, pp. 1 and I-1.

[43] Bratsk Aluminum Smelter v. United States, Slip Op. 08-5 (January 15, 2008).

[44] *Silicon Metal From Russia*, 73 FR 6204, February 1, 2008.

[45] *Silicon Metal From Russia: Investigation No. 731-TA-991 (Review)*, USITC Publication 4018, June 2008.

[46] *Silicon Metal From the Russian Federation: Final Results of Expedited Sunset Review of Antidumping Duty Order*, 73 FR 31064, May 30, 2008; *Silicon Metal From Russia*, 73 FR 38467, July 7, 2008.

[47] *Silicon Metal from the Russian Federation: Continuation Of Antidumping Duty Order*, 73 FR 40848 July 16, 2008.

The Commission's second five-year review of the antidumping duty order on imports of silicon metal from Russia was instituted on June 3, 2013.[48] In June 2014, the Commission completed its second full five-year review of the subject order and determined that revocation of the antidumping duty order on silicon metal from Russia would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.[49] Following affirmative determinations in the first five-year review by Commerce and the Commission,[50] Commerce issued a continuation of the antidumping duty order on imports of silicon metal from Russia, effective July 2, 2014.[51]

Silicon metal from Brazil and South Africa

On March 31, 2004, the Commission instituted a countervailing duty investigation on imports of silicon metal from Brazil and an antidumping investigation on imports of silicon metal from South Africa upon receipt of a petition filed by GSM; the International Union of Electronic, Electrical, Salaried, Machine and Furniture Workers, I.U.E.-C.W.A., AFL-CIO, C.L.C., Local 693; and the United Steelworkers of America, AFL-CIO, Local 9436.[52] On April 16, 2004, the petition was withdrawn and the investigations were subsequently terminated.[53]

NATURE AND EXTENT OF ALLEGED SUBSIDIES AND SALES AT LTFV

Alleged subsidies

On April 4, 2017, Commerce published a notice in the *Federal Register* of the initiation of its countervailing duty investigation on silicon metal from Australia, Brazil, and Kazakhstan.[54] Commerce initiated an investigation on the following alleged subsidy programs in Australia:[55]

A. Provision of Electricity for Less than Adequate Remuneration ("LTAR")
B. Payments Under the Demand Side Management Scheme

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[48] *Silicon Metal From Russia; Institution of a Five-Year Review*, 78 FR 33064, June 3, 2013.

[49] *Silicon Metal From Russia: Investigation No. 731-TA-991 (Second Review)*, USITC Publication 4471 (June 2014).

[50] *Silicon Metal From the Russian Federation: Final Results of the Expedited Second Sunset Review of the Antidumping Duty Order*, 78 FR 61334, October 3, 2013; *Silicon Metal From Russia*, 79 FR 34551, June 17, 2014.

[51] *Silicon Metal From the Russian Federation: Continuation of Antidumping Duty Order*, 79 FR 37718, July 2, 2014.

[52] *Silicon Metal From Brazil and South Africa*, 69 FR 18404, April 7, 2004.

[53] *Silicon Metal From Brazil and South Africa*, 69 FR 23213, April 28, 2004.

[54] *Silicon Metal From Australia, Brazil, and Kazakhstan: Initiation of Countervailing Duty Investigations*, 82 FR 16356, April 4, 2017.

[55] *Enforcement and Compliance Office of AD/CVD Operations, Countervailing Duty Initiation Checklist, Silicon Metal from Australia*, March 28, 2017.

C. Renewable Energy Target Program

Commerce initiated an investigation on the following alleged subsidy programs in Brazil:[56]

A. Domestic Programs
    1. Electricity for LTAR Pursuant to Laws No. 13,182 and 13,299
    2. Tax Incentives Provided By The Amazon Region Development Authority and Northeast Region Development Authority
    3. Tax Incentives in the State of Para for DC Brazil
    4. Real Estate Tax Exemption in the Municipality of Vareza da Palma for Rima
B. Export Subsidies
    1. Reintegra
    2. Integrated Drawback Regime

Commerce initiated an investigation on the following alleged subsidy programs in Kazakhstan:[57]

A. Provision of Electricity for LTAR
B. Corporate Income Tax Exemption
C. Property Tax Exemption
D. Land Tax and Land Use Fee Exemption
E. Customs Duty Exemption

Alleged sales at LTFV

On April 4, 2017, Commerce published a notice in the *Federal Register* of the initiation of its antidumping duty investigations on silicon metal from Australia, Brazil, and Norway.[58] Commerce has initiated antidumping duty investigations based on estimated dumping margins of between 28.58 and 52.81 percent based on comparisons of export value or constructed export value to normal value, and estimated dumping margins of between 42.33 and 45.77 percent based on comparisons of export value or constructed export value to constructed value for silicon metal from Australia. Commerce has also initiated antidumping duty investigations based on estimated dumping margins of between 15.41 and 28.24 percent based on comparisons of export value or constructed export value to normal value, and estimated

[56] *Enforcement and Compliance Office of AD/CVD Operations, Countervailing Duty Initiation Checklist, Silicon Metal from Brazil*, March 28, 2017.

[57] *Enforcement and Compliance Office of AD/CVD Operations, Countervailing Duty Initiation Checklist, Silicon Metal from Kazakhstan*, March 28, 2017.

[58] *Silicon Metal from Australia, Brazil and Norway: Initiation of Less-Than-Fair-Value Investigations*, 82 FR 16352, April 4, 2017.

dumping margins of between 121.79 and 134.92 percent based on comparisons of export value or constructed export value to constructed value for silicon metal from Brazil. In addition, Commerce has initiated antidumping duty investigations based on estimated dumping margins of between 32.25 and 45.66 percent for silicon metal from Norway.

THE SUBJECT MERCHANDISE

Commerce's scope

Commerce has defined the scope of this investigation as follows:[59]

> *…all forms and sizes of silicon metal, including silicon metal powder. Silicon metal contains at least 85.00 percent but less than 99.99 percent silicon, and less than 4.00 percent iron, by actual weight. Semiconductor grade silicon (merchandise containing at least 99.99 percent silicon by actual weight and classified under Harmonized Tariff Schedule of the United States ("HTSUS") {statistical reporting number} 2804.61.0000) is excluded from the scope of these investigations. Silicon metal is currently classifiable under {statistical reporting numbers} 2804.69.1000 and 2804.69.5000 of the HTSUS. While HTSUS numbers are provided for convenience and customs purposes, the written description of the scope remains dispositive.*

Tariff treatment

Based upon the scope set forth by the Department of Commerce, information available to the Commission indicates that the merchandise subject to these investigations is imported under statistical reporting numbers 2804.69.1000 and 2804.69.5000. The Column 1-General rates of duty are 5.3 percent and 5.5 percent *ad valorem*, respectively. Decisions on the tariff classification and treatment of imported goods are within the authority of U.S. Customs and Border Protection.

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[59] *Silicon Metal from Australia, Brazil and Norway: Initiation of Less-Than-Fair-Value Investigations*, 82 FR 16352, April 4, 2017; *Silicon Metal from Australia, Brazil, and Kazakhstan: Initiation of Countervailing Duty Investigations*, 82 FR 16356, April 4, 2017; *Enforcement and Compliance Office of AD/CVD Operations, Countervailing Duty Initiation Checklist, Silicon Metal from Australia*, March 28, 2017; *Enforcement and Compliance Office of AD/CVD Operations, Countervailing Duty Initiation Checklist, Silicon Metal from Brazil*, March 28, 2017; *Enforcement and Compliance Office of AD/CVD Operations, Countervailing Duty Initiation Checklist, Silicon Metal from Kazakhstan*, March 28, 2017; *Enforcement and Compliance Office of AD/CVD Operations, AD Initiation Checklist, Silicon Metal from Australia*, March 28, 2017; *Enforcement and Compliance Office of AD/CVD Operations, AD Initiation Checklist, Silicon Metal from Brazil*, March 28, 2017; *Enforcement and Compliance Office of AD/CVD Operations, AD Initiation Checklist, Silicon Metal from Norway*, March 28, 2017.

THE PRODUCT

Description and applications[60]

Silicon is a light chemical element with metallic and nonmetallic characteristics. It is a semiconductor, meaning it does not conduct electricity at room temperature, but does so when it is heated. Silicon is rarely found free in nature; it combines with oxygen and other elements to form silicates, which compose more than 25 percent of the Earth's crust. Silica in the form of quartz[61] or quartzite is used to produce silicon ferroalloys for the iron and steel industries, while silicon metal is primarily used by the aluminum and chemical industries.[62] Silicon metal is a product normally composed almost entirely of elemental silicon, along with small amounts of other elements, such as iron, aluminum, and calcium.[63] It is manufactured and sold in various degrees of purity. Whether domestic or imported, it is usually sold in lump form, typically ranging from 6 inches x ½ inches to 4 inches x ¼ inch, or in powder form.[64]

Silicon metal is principally used as an alloying agent in aluminum production by the aluminum industry and as an input in the production of silicones and to produce polysilicon. According to the U.S. Geological Survey ("USGS"), in 2014, total reported consumption of silicon metal in the United States was about 209,000 short tons; about 84 percent was used to produce chemicals (and some unspecified products), 15 percent was used in aluminum alloys, and about 2 percent was used in steel alloys.[65]

Chemical manufacturers consume silicon metal in powder form to produce silicones and polysilicon. The chemical manufacturers that have their own grinding facilities purchase silicon metal in lump form and grind it into powder themselves. Firms that do not have grinding facilities purchase silicon metal in powder form.[66] A lower grade of powder called fines, a by-

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[60] Unless otherwise indicated, information in this section was taken from the Petition, Vo. I, pp. 6–9 and *Silicon Metal From Russia: Investigation No. 731-TA-991 (Second Review)*, USITC Publication 4471, June 2014, pp. I-18-21.

[61] Quartz is a chemical compound consisting of one part silicon and two parts oxygen, also known as silicon dioxide (SiO_2).

[62] USGS, 2014 Minerals Yearbook, Silicon Chapter, p. 67.1, https://minerals.usgs.gov/minerals/pubs/commodity/silicon/myb1-2014-simet.pdf, accessed March 22, 2017.

[63] Silicon metal can be further processed into ultra-high-purity semiconductor or solar grades whose silicon content is 99.99 percent or greater. Semiconductor-grade silicon metal is not included within the scope of this investigation. However, subject silicon metal may be used as a starting material for the manufacture of semiconductor-grade silicon metal.

[64] These dimensions refer to the maximum and minimum sizes of the silicon metal lumps.

[65] USGS, 2014 Minerals Yearbook, Silicon Chapter, table 4, https://minerals.usgs.gov/minerals/pubs/commodity/silicon/myb1-2014-simet.pdf, accessed March 22, 2017.

[66] Size consistency is important to chemical producers that purchase silicon metal in powder form. Suppliers to such customers must qualify their product before bidding to supply the chemical

(*continued*...)

product of the crushing and sizing process, is sold for ceramic and refractory applications. In the chemical industry, silicon metal is used as the basis for the production of silanes, which are used to produce a family of organic compounds known as silicones. Silicones are used for a variety of applications including resins, lubricants, plastomers, anti-foaming agents, and water-repellent compounds.[67] Silicon metal is consumed as the base material for making polysilicon, a very high purity form of silicon manufactured by chemical producers that is primarily used in semiconductors and solar cells.[68]

As an alloying agent, silicon metal is used in the production of both primary aluminum (produced from ore) and secondary aluminum (produced from scrap). Silicon is a necessary ingredient in aluminum casting alloys, where it improves fluidity, castability, strength, and weldability when added to aluminum.[69] Other applications for silicon metal include the production of brass and bronzes, die casting, steel, copper alloys, ceramic powders, and refractory coatings.

According to the petitioner, although silicon metal is often described in terms of different grades, there is no uniformly accepted grade classification system. Silicon metal "grades" refer to ranges of specifications that are typically sold to particular types of customers.[70] These specifications establish the minimum amounts of silicon and the maximum amounts of other elements, such as iron, calcium, and aluminum that the silicon metal may contain. The ranges of specifications vary depending on the type of end use of the silicon metal and the differences between these ranges of specifications can be relatively small but important.[71] There are four broadly defined categories, or grades, of silicon metal, which are generally ranked in descending order of purity as: (1) semiconductor grade;[72] (2) chemical

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(…*continued*)
manufacturer. For that reason, there is no difference in terms of size consistency between qualified imports and domestic products.

[67] The silicones production process involves reacting silicon metal with methyl chloride in the presence of a copper catalyst to produce a mixture of methylchlorosilanes. Certain of these silanes are then hydrolyzed to produce the basic methylsilicone building block for the various silicone products.

[68] Polysilicon, which is not within the scope of this investigation, generally contains over 99.999 percent silicon and is made by reacting high purity metallurgical silicon with hydrogen chloride gas in the presence of catalysts, producing silicon tetrachloride, which is then purified by fractional distillation. The purified distillate is pyrotically decomposed to produce hyperpure metal and hydrochloric acid.

[69] Many aluminum alloys are used by the transportation sector as a substitute for heavy metals to reduce weight and improve the efficiency of vehicles and aircraft. Primary aluminum is frequently used to make components that require higher purity aluminum, such as automobile wheels and secondary-aluminum is primarily used in castings for automobiles.

[70] Some suppliers, customers, and publications refer to numerical grade designations such as "Grade 553." "Grade 553" is silicon metal with a maximum iron content of 0.5 percent, a maximum aluminum content of 0.5 percent, and a maximum calcium content of 0.3 percent. Such silicon metal normally has a minimum silicon content of 98.5 percent.

[71] In some cases, higher grade silicon metal is shipped to a purchaser with a lower specification requirement.

[72] Semiconductor-grade silicon, used in the electronics industry, is not covered by the scope of this investigation. It is a high-purity product generally containing over 99.99 percent silicon.

grade; (3) a metallurgical grade used to produce primary aluminum; and (4) a metallurgical grade used to produce secondary aluminum.[73] One domestic producer (Globe) lists its silicon metal product specifications as:[74]

- Chemical grade: silicon 98.50 percent min., iron 0.50 percent max., calcium 0.07 percent max., aluminum 0.20 percent max.
- Primary aluminum grade: silicon 98.50 percent min., iron 0.35 percent max., calcium 0.07 percent max.
- Secondary aluminum grade: silicon 98.50 percent min., iron 1.00 percent max., calcium 0.40 percent max.
- High purity grade: silicon 98.50 percent min., iron 0.10 percent max., calcium 0.07 percent max., aluminum 0.20 percent max.

Silicon specifications can be customer-specific and some customers, such as certain polysilicon producers, require higher grades of silicon than the ones listed by Globe.[75] Some polysilicon producers require their suppliers to go through a qualification process and undergo subsequent monitoring of their manufacturing facilities to ensure that their products are consistent in size and grade.[76]

Manufacturing Process[77]

The basic process for producing silicon has been essentially unchanged for decades.[78] With one exception,[79] all silicon metal, regardless of specification, is produced using the same

[73] Respondent Wacker stated that the U.S. market for silicon metal is characterized by the following distinct market segments: (1) polysilicon; (2) chemicals (principally for the manufacture of silicones); and (3) primary and secondary aluminum. Distinct market segments that (1) each have a unique range of product specifications, which are not generally interchangeable, (2) are produced by specialized manufacturers using different raw materials and processes, (3) have entirely different end-use customers, and (4) have distinct pricing levels. Joint Respondents' postconference brief, pp. 11-12.

[74] *Globe Chemical and Metallurgical Grade Silicon product information sheets,* Globe Specialty Metals Inc., http://www.glbsm.com/product-information/Globe-Silicon-Metal.pdf, accessed March 22, 2017.

[75] Joint Respondents' postconference brief, pp. 9-10.

[76] Joint Respondents' postconference brief, pp. 9-10.

[77] Unless otherwise indicated, information in this section was taken from the Petition, Vol. I, pp. 9-10.

[78] Missisippi Silicon LLC website, retrieved at http://www.missilicon.com/our-process on March 22, 2017.

[79] Elkem manufacturers Silgrain –a high purity silicon powder that is produced by refining 90-94 percent ferrosilicon using a proprietary chemical leaching process. Like silicon metal produced using the standard process, Silgrain is used in the production of polysilicon, silicones, and other specialized materials.

process and inputs. Silica in the form of high purity quartz[80] is combined in a "charge" with a carbon source such as low-ash coal, charcoal, or petroleum coke, and a bulking agent, usually wood chips. The charge is placed in a submerged electric arc furnace.[81] Electrical energy is delivered from a transformer system to the furnace. High-current, low-voltage electricity is delivered to the reaction by conductors made from pre-baked or self-baking amorphous carbon. The charge is heated to approximately 3,000 degrees Fahrenheit, at which point the oxygen in the $Si0_2$ separates from the silicon and combines with the carbon in the reductant to form carbon monoxide gas. The simplified chemical reaction is summarized as SiO_2 (silica) + 2C (carbon) → Si (silicon metal) + 2CO (carbon monoxide). This reaction requires a substantial amount of electricity, giving the transformation process its name of electrometallurgy.[82] The gas escapes, leaving molten silicon.

The silicon is removed or "tapped" from the bottom of the furnace on either a continuous or an intermittent basis. In the molten state, the silicon metal is often refined by oxygen injection to remove impurities such as aluminum and calcium. Some impurities cannot be removed from the liquid silicon and, therefore, must be controlled by raw material selection.[83] [84] After tapping (or refining), the silicon metal is poured into large flat iron molds or onto beds of silicon metal fines. The resulting ingot or billet is subsequently crushed to the desired size specification. It is ground into powder for some customers in the chemicals

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[80] Silicon is one of the most common elements on the earth's surface. Silicon appears abundantly in combination with oxygen as "silica" - a compound composed almost entirely of silicon dioxide ($Si0_2$) - and as a component of many silicate minerals, such as quartzite (a rock composed principally of quartz), sand, and sandstone. These forms of silica are ubiquitous in the United States and throughout the world. However, only silica with a silicon dioxide content in excess of 99 percent and a low iron content (less than one percent) can be used effectively in the production of silicon metal.

[81] Smelting in an electric arc furnace is accomplished by conversion of electrical energy to heat. An alternating current applied to the electrodes causes current to flow through the charge between the electrode tips. This provides a reaction zone at temperatures up to 3,632 degrees Fahrenheit. The tip of each electrode changes polarity continuously as the alternating current flows between the tips. To maintain a uniform electric load, electrode depth is continuously varied automatically by mechanical or hydraulic means. In a submerged arc electric furnace, metal is smelted in a refractory-lined cup-shaped steel shell by submerged graphite electrodes. The United States Environmental Protection Agency, pp. 12.4.1–12.4.3, https://www3.epa.gov/ttn/chief/ap42/ch12/final/c12s04.pdf, accessed March 24, 2017.

[82] *Silicon metal and ferrosilicon production,* The European Association of Industrial Silica Producers, http://www.eurosil.eu/silicon-metal-and-ferrosilicon-production, accessed March 23, 2017.

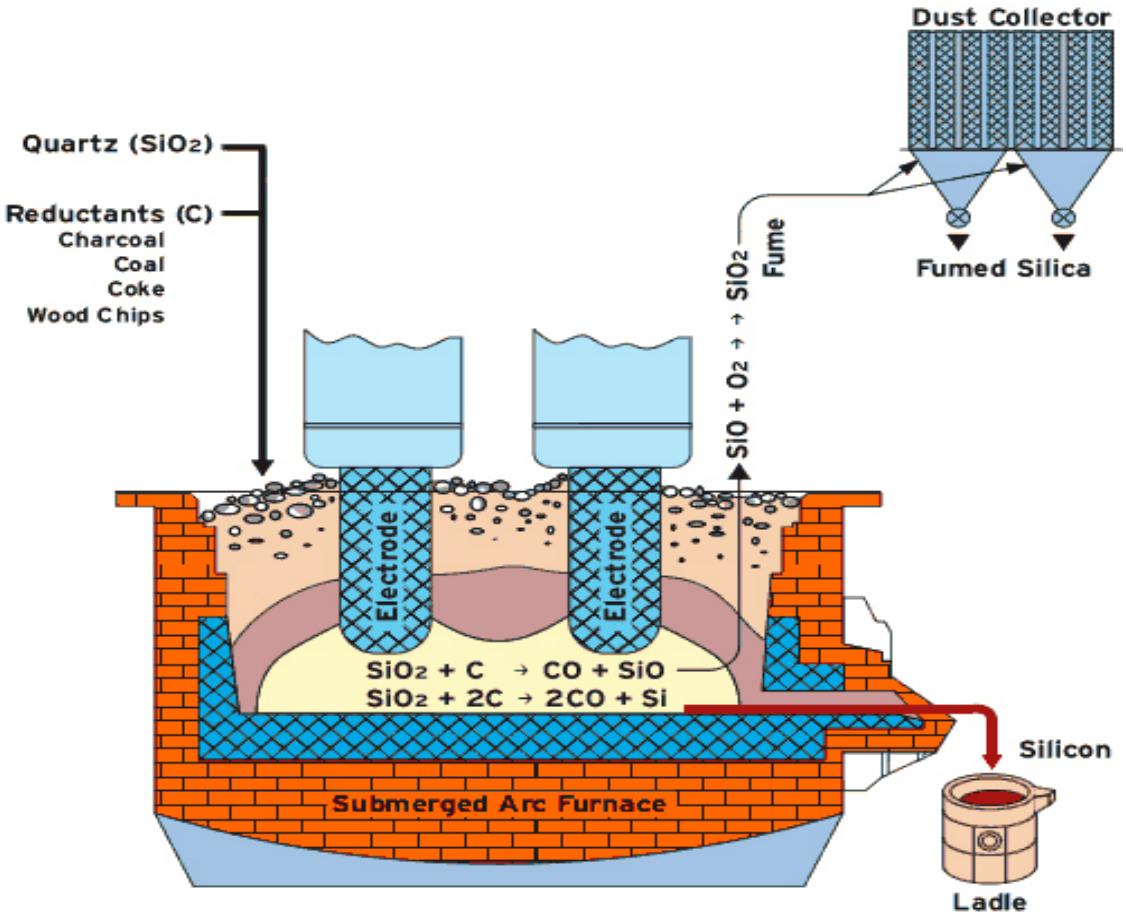
[83] In practice, only the ranges of aluminum and calcium can be adjusted by refining the silicon metal. The quality of silicon metal is a function of the quality of the raw materials, production and furnace expertise, as well as good refining processes. Silicon metal producers therefore generally specialize and aim to produce specific qualities for specific customers, and the production cost of each producer therefore depends also on the quality aimed to be produced by them. Joint Respondents' postconference brief, p. 13.

[84] ***. Petition, Vol. I, exh. I-9.

industry.[85] The silicon is typically delivered to end users in 2,000 to 3,000 pound super sacks, wooden boxes, or customer specific packaging.[86]

Figure I-4 depicts the silicon metal production process (does not show steps after tapping molten silicon):

Figure I-4
Silicon metal: Production process



Source: Simcoa Operations Pty. Ltd website, http://www.simcoa.com.au/process-diagram.html.

Silica fume (microsilica) - small particles of unreduced silicon dioxide recovered from the off-gases of silicon metal furnaces - is a by-product of silicon metal production. Silica fume is used in making concrete, oil well grouts, cementitious repair products, refractory and ceramics, and other products.

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[85] Conference transcript, p. 26 (Huck).

[86] *Globe Chemical and Metallurgical Grade Silicon product information sheets*, Globe Specialty Metals Inc., http://www.glbsm.com/product-information/Globe-Silicon-Metal.pdf, accessed March 22, 2017.

Silicon plants typically aim to operate furnaces 24 hours per day, 7 days per week, to maximize efficiency.[87] Forty-five percent of the cost of silicon metal production is attributable to raw material costs (coal, wood chips, quartz, carbon electrodes), 23 percent to energy and labor, and 9 percent to other costs.[88]

Silicon furnaces are relatively similar worldwide, but there are some physical differences in furnace and the electrodes. In some cases, newer furnaces are more energy efficient. Reportedly, Globe requires about 13,000 to 14,000 kilowatt hours of electricity to produce one short ton of silicon metal,[89] but some plants with newer furnaces, like Mississippi, are able to produce the same quantity of silicon metal using only 9,500 to 10,000 kilowatt hours of electricity.[90] Purities of the raw materials and the carbon sources used can vary widely. There are, however, characteristics that silicon production facilities share worldwide. For example, given the large amounts of quartz required to produce silicon metal, plants are normally located near quartz sources.

Some producers of silicon metal also produce ferrosilicon, which is used in the production of steel (especially stainless and heat-resisting steel) and cast iron.[91] In the United States, Globe produced both silicon metal and ferrosilicon, but did not use the same furnaces for both. Producers can switch production on a furnace between ferrosilicon and silicon metal with varying degrees of cost, downtime, and efficiency loss. It is generally easier for firms to switch from silicon metal production to ferrosilicon production than the reverse. Iron and other elements that may be contained in ferrosilicon tend to remain in a furnace lining and result in impurities intolerable in silicon metal production.[92] In addition, certain furnace designs are more efficient at producing one product than another, leading to possible efficiency loss when switching production. According to Globe, incentives for converting ferrosilicon furnaces to silicon metal furnaces may exist if the margins for silicon metal are sufficiently better than the margins for ferrosilicon. Globe indicated that conversion from ferrosilicon to silicon production can be conducted relatively quickly, easily, and "at a relatively moderate cost." Such a conversion would require removal of the material from the furnace, the replacement of the electrodes and possibly the ceramic refractory lining in the furnace, and a change in the raw materials used for production.[93]

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[87] Conference transcript, p. 26 (Huck).

[88] Investor Presentation, January 2017, Ferroglobe PLC, p. 6, http://investor.ferroglobe.com/common/download/download.cfm?companyid=AMDA-5STP82&fileid=890793&filekey=CFE050BE-EFCF-45C5-B36E-E2175021C697&filename=Ferroglobe_-_Investor_Presentation.pdf, accessed March 24, 2017.

[89] Conference transcript, p. 26 (Huck).

[90] Conference transcript, p. 125 (Majumdar).

[91] Ferrosilicon is a product used by the steel industry as an alloying agent. Ferrosilicon differs from silicon metal in that it has much lower silicon content and contains 4 percent or more of iron.

[92] Conference transcript, pp. 40-41 (Huck and Perkins).

[93] Conference transcript, pp. 40-41 (Huck and Perkins).

DOMESTIC LIKE PRODUCT ISSUES

In its original determinations concerning silicon metal from Argentina, Brazil, and China, the Commission found the appropriate domestic like product to be all silicon metal, regardless of grade, having a silicon content of at least 96.00 percent but less than 99.99 percent of silicon by weight, and excluding semiconductor grade silicon; it found one domestic industry consistent with its domestic like product finding. In the first, second, and third five-year review determinations, the Commission defined the domestic like product as all silicon metal, regardless of grade and corresponding to the scope of the orders, and it found the domestic industry to be all domestic producers of silicon metal.[94]

In its original determinations concerning silicon metal from Russia, the Commission found that there was one domestic like product consisting of all silicon metal, regardless of grade, based on shared physical characteristics, some overlapping uses, similar channels of distribution, some interchangeability, the same production processes and employees, and relatively minor difference in prices between the grade of silicon metal. In the first and second five-year review determinations, the Commission determined that no new facts existed to warrant a conclusion different from that in the original investigation and again found one domestic like product consisting of all silicon metal, regardless of grade.[95]

In these preliminary phase investigations concerning silicon metal from Australia, Brazil, Kazakhstan, and Norway, the petitioner contends that silicon metal continues to be a single domestic like product.[96] The respondents, however, explain that there have been significant changes that would merit a reassessment of the Commission's determination of a single domestic like product in previous proceedings involving silicon metal. For example, the consumption of ultra-pure silicon metal for use in the polysilicon industry has greatly expanded, which creates a more segmented market with differences in physical characteristics, uses, channels of distribution, lack of interchangeability, and price. For limited purposes of these

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[94] *Silicon Metal From Brazil and China: Investigation Nos. 731-TA-471 and 472 (Second Review)*, USITC Publication 3892, December 2006, pp. 4-5; *Silicon Metal From Brazil and China: Investigation Nos. 731-TA-471 and 472 (Second Review)*, USITC Publication 3892, December 2006, pp. 4-5. In 1993, in a response to a request by domestic interested parties for clarification of the scope of the antidumping duty order concerning China, Commerce determined that silicon metal containing between 89.00 percent and 99.00 percent silicon by weight, but which contains a higher aluminum content than the silicon metal containing at least 96.00 percent, but less than 99.99 percent silicon by weight, is the same class or kind of merchandise as the silicon metal described in the original order concerning China. *Scope* Rulings, 58 FR 27542, May 10, 1993.

[95] *Silicon Metal From Russia: Investigation No. 731-TA-991 (Second Review)*, USITC Publication 4471, June 2014, p. 7.

[96] Petitioner's postconference brief, p. 4. The petitioner notes that Silgrain, a type of silicon metal imported from Norway, is the one type of silicon metal that is not manufactured by U.S. producers. However, the petitioner further explains that Silgrain is like other high purity silicon metal powder with respect to all other domestic like product factors. Conference transcript, p. 27 (Huck); petitioner's postconference brief, p. 6.

preliminary investigations, however, the respondents are not contesting a single domestic like product that is coextensive with the scope of these investigations.[97]

[97] Joint Respondents' postconference brief, pp. 6-7, exh. 2.

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

U.S. MARKET CHARACTERISTICS

Silicon metal is composed almost entirely of elemental silicon with very small amounts of impurities, such as iron, calcium, and aluminum, and is sold in lump and powder form.[1] There are three main end users of silicon metal in the U.S. market: chemical producers, primary aluminum producers, and secondary aluminum producers.

In the chemical sector, silicon metal is used to produce silicones and high-purity forms of silicon, such as polysilicon.[2] Primary and secondary aluminum producers use silicon metal as an alloying agent.[3] Demand for silicon metal is derived from the demand for the silicon-based chemicals and aluminum alloys in which it is used as an input.[4] Silicon metal can also be used in the production of trichlorocyline and some gases.[5]

Apparent U.S. consumption of silicon metal fluctuated, but decreased overall during 2014-16. Overall, apparent U.S. consumption in 2016 was *** percent lower than in 2014, at *** short tons of contained silicon.

CHANNELS OF DISTRIBUTION

Since January 2014, the vast majority of both domestic and imported silicon metal was sold to end users as shown in table II-1. U.S. producers sold mainly to *** and, as a group, subject importers sold mainly to chemical users. A large majority of shipments of Brazilian product were to chemical users, while the majority of Australian and Kazakh[6] importers sold most of their product to primary and secondary aluminum producers. Most shipments of Norwegian silicon metal were sold to *** with an increasing share to secondary aluminum producers over the period of investigation. Respondents suggest that since *** are captively consumed, these imports enter a different channel of distribution than domestically produced silicon metal or other subject imports.[7] Silicon chemical, polysilicon, and aluminum consumers

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[1] Conference transcript, p. 18 (Perkins); Petitioner's postconference brief, p. 4. U.S. importers of silicon metal from *** reported that they primarily ship silicon mental in lump form, while importers of silicon metal from *** reported selling silicon metal primarily in powder form.

[2] Polysilicon is used in computer chips, solar panels, etc. Conference transcript, p. 56 (Perkins, Lutz).

[3] Conference transcript, p. 18 (Perkins).

[4] *Silicon Metal from Russia, Inv. No. 731-TA-991 (Second Review)*, USITC Publication 4471, June 2014, p. II-1.

[5] Conference transcript, p. 56 (Perkins).

[6] Respondents stated that Kazakh producers use a low-quality coal and do not have access to woodchips; this precludes these producers from producing silicon metal suitable for chemical or polysilicon use. Joint respondents' postconference brief, pp. 13, 28.

[7] Dow Corning's postconference brief, p. 8.

are the largest end users of silicon metal, but some product is sold to high-tech ceramics and die cast aluminum shops.[8]

Table II-1
Silicon metal: U.S. producers' and importers' U.S. commercial shipments and imports for own use, by sources and channels of distribution, January 2014-December 2016

* * * * * * *

GEOGRAPHIC DISTRIBUTION

U.S. producers and importers reported selling silicon metal to all regions in the contiguous United States (table II-2). For U.S. producers, *** percent of sales were within 100 miles of their production facility, *** 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. point of shipment, *** percent between 101 and 1,000 miles, and *** percent over 1,000 miles.

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

Region	U.S. producers	Subject U.S. importers				Subject importers
		Australia	Brazil	Kazakhstan	Norway	
Northeast	2	***	***	***	***	7
Midwest	3	***	***	***	***	9
Southeast	3	***	***	***	***	7
Central Southwest	2	***	***	***	***	2
Mountains	2	***	***	***	***	4
Pacific Coast	3	***	***	***	***	5
All regions	2	***	***	***	***	1
Reporting firms	3	3	8	3	5	11

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

SUPPLY AND DEMAND CONSIDERATIONS

U.S. supply

Domestic production

Based on available information, U.S. producers of silicon metal have the ability to respond to changes in demand with small changes in the quantity of shipments of U.S.-produced silicon to the U.S. market. The factors mitigating responsiveness of supply are a lack of limited available capacity and inventories, a limited ability to shift shipments from alternate markets, and some ability to shift production from alternate products.

[8] Conference transcript, p. 54 (Perkins).

Industry capacity

Domestic capacity utilization decreased from *** percent to *** percent during 2014-16, driven by ***. This relatively high level of capacity utilization suggests that U.S. producers may have limited ability to increase production of silicon metal in response to an increase in prices. Respondents stated that domestic producers are unable to fully supply the domestic market.[9]

Alternative markets

During 2014-16, U.S. producers' export shipments rose from *** percent to *** percent of total shipments indicating that U.S. producers may have a limited ability to shift shipments between the U.S. market and other markets in response to price changes.

Inventory levels

U.S. producers' inventories fluctuated during 2014-16, but remained relatively unchanged overall. Relative to total shipments, U.S. producers' inventories increased from *** percent in 2014 to *** percent in 2015, and fell to *** percent in 2016. These inventory levels suggest that U.S. producers may have a limited ability to respond to changes in demand with changes in the quantity shipped from inventories.

Production alternatives

*** responding U.S. producers stated that they could switch production from silicon metal to other products. Another product that producers reportedly can produce on the same equipment as silicon metal is ferrosilicon and other ferroalloy products, although switching production to some of these products would require downtime so that equipment can be modified, and new procedures and lab test methods would potentially need to be developed.

Petitioner stated that it is relatively easy to switch production from silicon metal to ferrosilicon, but switching production back to silicon metal is more difficult. This is because the contaminated shell must be cleared of iron and some other elements that are detrimental to the quality of silicon metal.[10]

Supply constraints

*** U.S. producers reported that they had not refused, declined, or been unable to supply silicon metal since 2014. U.S. producer *** reported that it had ***.

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[9] Joint Respondents' postconference brief, p. 5. In 2016, U.S. producers' capacity was *** short tons, and U.S. apparent consumption was *** short tons, including ***.

[10] Conference transcript, p. 41 (Perkins).

Subject imports[11]

Table II-3 provides a summary of supply-related data for subject countries.

Table II-3
Silicon metal: Foreign industry factors that affect ability to increase shipments to the United States

* * * * * * *

Subject imports from Australia

Based on available information, producers of silicon metal from Australia have the ability to respond to changes in demand with small-to-moderate changes in the quantity of shipments of silicon metal to the U.S. market. The main contributing factors to this degree of responsiveness are some availability of inventories and an ability to shift shipments from alternate markets. The factors mitigating responsiveness of supply are a lack of unused capacity and an ***.[12]

Importer *** reported that its ability to supply silicon metal to the U.S. market is constrained by ***.

Subject imports from Brazil

Based on available information, producers of silicon metal from Brazil have the ability to respond to changes in demand with moderate changes in the quantity of shipments of silicon metal to the U.S. market. The main contributing factors to this degree of responsiveness of supply are some availability of unused capacity and inventories, an ability to shift production from alternate products, and an ability to shift shipments from alternate markets. The factors mitigating responsiveness of supply are a lack of unused capacity.

Subject imports from Kazakhstan

Based on available information, producers of silicon metal from Kazakhstan have the ability to respond to changes in demand with small-to-moderate changes in the quantity of shipments of silicon metal to the U.S. market. The main contributing factors to this degree of responsiveness are some availability of inventories and an ability to shift shipments from alternate markets. The factors mitigating responsiveness of supply are a lack of unused capacity

[11] For data on the number of responding foreign firms and their share of U.S. imports from Australia, Brazil, Kazakhstan, and Norway, please refer to Part I, "Summary Data and Data Sources."

[12] Generally firms are able to switch production between silicon metal and ferrosilicon. See Part I. ***.

in the latter part of the period of investigation, and an inability to shift production from alternate products.

Subject imports from Norway

Based on available information, producers of silicon metal from Norway have the ability to respond to changes in demand with moderate changes in the quantity of shipments of silicon metal to the U.S. market. The main contributing factors to this degree of responsiveness are the availability of inventories and an ability to shift shipments from alternate markets. The factors mitigating responsiveness of supply are a lack of unused capacity and an inability to shift production from alternate products.

Nonsubject imports

Nonsubject imports accounted for *** percent of total U.S. imports in 2016. The largest sources of nonsubject imports during 2014-16 were South Africa and Canada, in order of size. Combined, these countries accounted for *** percent[13] of nonsubject imports in 2016.

U.S. demand

Based on available information, the overall demand for silicon metal is likely to experience small changes in response to changes in price. While silicon metal accounts for a varying amount of the total cost of its end-use products, demand responsiveness is constrained by the lack of substitute products.

Respondents stated that the key drivers of silicon metal demand -- the solar, chemical, and aluminum industries -- are robust and growing.[14]

End uses and cost share

Silicon metal is primarily used by chemical producers in the production of silicones and polysilicon and by aluminum producers as an alloying agent.[15] Chemical end uses identified by firms include chlorosilanes, polycrystalline silicon, polysilicon, sealants, silicones, and silicone adhesive sealants. Aluminum end uses include aluminum alloys, aluminum castings, and foundry ingots.[16]

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[13] Calculated based on quantity (short tons of contained silicon). Official U.S. imports based on General Imports using statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed on March 16, 2017.

[14] Joint respondents' postconference brief, p. 44.

[15] Petition, p. 7; Conference transcript, p. 86 (Walters); Brazilian producers' postconference brief, p. 11.

[16] Data from Commission questionnaires; *Silicon Metal from Russia, Inv. No. 731-TA-991 (Second Review)*, USITC Publication 4471, June 2014, p. II-5.

Silicon metal accounts for a small-to-moderate share of the cost of the end-use products in which it is used. Reported cost shares for chemicals ranged from 12 percent to 34 percent of total cost and reported cost shares for primary and secondary aluminum applications were generally less than 10 percent.

Business cycles

*** U.S. producers and seven of 12 importers indicated that the market was subject to business cycles or conditions of competition. Specifically, U.S. producers *** reported that the silicon metal market is subject to business cycles that are heavily dependent on the aluminum industry and on the many consumer products that use silicones. U.S. producer *** reported that supply increases tend to be "lumpier" or less smooth as demand increases which lead to a market that may fluctuate between over- and under-supply. This producer also reported that the appreciating U.S. dollar also affects competitiveness of the domestic industry.

*** U.S. producers and most importers (5 of 8) reported that there have been changes to business cycles and conditions of competition since 2014. U.S. producer *** reported that there has been a decline in demand for polysilicon production because the polysilicon market has experienced a decline in production, and U.S. producer *** cited the concentration of silicon supply through the merger of Globe and FerroAtlántica. Importers *** also cited the merger and market entry of U.S. producer Mississippi in the silicon metal market as changes to the distinct conditions of competition in the silicon metal market.

Demand trends

Most firms reported decreasing or fluctuating U.S. demand for silicon metal since January 1, 2014 (table II-4). Respondents stated that demand conditions for silicon metal are strong and projected to increase, and the petitioner stated that demand for silicon metal fluctuates with the demand for downstream products.[17]

Table II-4
Silicon metal: 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	***	***	***	***
Importers	3	1	4	2
Demand outside the United States:				
U.S. producers	***	***	***	***
Importers	8	1	1	0

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

[17] Conference transcript, p. 96 (Bednarczyk); Petitioner's postconference brief, p. 16; MPM's postconference brief, p. 6.

Respondents stated that they anticipate continued growth in demand for polysilicon and demand in the chemical industry for silicon metal used to manufacture silicones.[18] They also stated that the market composition and demand for silicon metal have changed as the consumption of high quality, pure silicon metal for polysilicon has expanded, and that demand for silicon metal from polysilicon manufacturers is currently the biggest driver of demand growth in the U.S. market.[19]

Substitute products

All responding producers and importers reported that there are no substitutes for silicon metal.

SUBSTITUTABILITY ISSUES

The degree of substitution between domestic and imported silicon metal depends upon such factors as relative prices, quality (e.g., grade standards, reliability of supply, defect rates, 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 silicon metal and silicon metal imported from subject sources.

Lead times

Domestically produced silicon metal is primarily produced-to-order, while imported silicon metal is primarily shipped from U.S. inventories. U.S. producers reported that *** percent of their commercial shipments were produced-to-order, with lead times averaging almost *** days. The remaining *** percent of their commercial shipments came from inventories, with lead times averaging almost *** days. Subject importers reported that *** percent of their shipments are from U.S. inventories (with average lead times of about *** days), *** percent were produced-to-order (with average lead times of about *** days), and the remaining *** percent being sold from foreign inventories (with average lead times of *** days).

Factors affecting purchasing decisions

Purchasers responding to lost sales lost revenue allegations[20] were asked to identify the main purchasing factors their firm considered in their purchasing decisions for silicon metal

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[18] Conference transcript, p. 70 (Lewis).

[19] ***. Joint respondents' postconference brief, pp. 6, 11, 17, Exhibit 7.

[20] This information is compiled from responses by purchasers identified by Petitioners to the lost sales lost revenue allegations. See Part V for additional information.

(table II-5). The major purchasing factors identified by firms include quality, reliability of supply, and timely delivery, and price.[21]

Table II-5

Silicon metal: Ranking of factors used in purchasing decisions as reported by U.S. purchasers, by factor

Item	1st	2nd	3rd	Total
	Number of firms (number)			
Price / Cost	1	2	6	9
Quality	4	3	0	7
Availability / Supply / Reliability	3	3	1	7
All other factors[1]	1	1	2	NA

[1] Other factors include trusting relationships with suppliers and social sustainability.

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

Quality of raw material input

The quality of silicon metal is largely determined by the quality of raw materials used in its production, and seven purchasers reported that quality is an important factor in their purchasing decisions and four of those purchasers reported that it was first most important (see table II-5 above). Purchaser Wacker Polysilicon North America ("WPNA") stated that its suppliers must pass a three-step qualification process and continuous monitoring after approval; WPNA stated that both U.S. producers, Globe and Mississippi, have sometimes had difficulties meeting requirements. Additionally, to ensure high reactivity and selectivity, the silicon metal used in the reaction process must be of high and stable quality, making it difficult for the firm to switch suppliers. [22]

Brazilian producers use charcoal as a resin in their production process rather than coal and use a production process that offers high reactivity and selectivity for downstream silicon metal products.[23] Brazilian producer LIASA stated that its silicon metal has very low levels of impurities due to the high quality of raw materials used in its production.[24] ***.[25] Respondents stated that Kazakh producers use a low-quality coal and do not have access to woodchips; this precludes these producers from producing silicon metal suitable for chemical or polysilicon use.[26]

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[21] Responses to Commission questionnaires; Joint respondents' postconference brief, p. 11.

[22] Conference transcript, p. 77-78 (Hudson). Respondents stated that it can take 9 to 12 months to qualify a basic silicon production plant, and that even if two producers sell silicon metal at the same grade, it would still require consumers 9 to 12 months to switch suppliers. Conference transcript, p. 106 (Mintzer).

[23] Conference transcript, p. 89 (Augusto).

[24] Conference transcript, p. 89 (Augusto); Brazilian producers' postconference brief, p. 3.

[25] Dow Corning's postconference brief, pp. 6, 9.

[26] Joint Respondents' postconference brief, pp. 13, 28.

Supplier certification and specifications

Purchasers typically receive offers or bids from four to six suppliers, and in some cases may contact up to 10 suppliers.[27] Importer REC Silicon reported that it purchases specialty, high-quality silicon metal, and that its qualification process can take up to two years. There are only a few sources that meet its requirements, and of those, only specific plants are qualified from those suppliers.[28]

Respondent MPM stated that chemical manufacturers do not demand interchangeable specifications and that a silicon metal manufacturer cannot simply keep particular grades in inventory and plan to sell them to every chemical manufacturer. MPM stated that while prices may not vary between different specifications, physical characteristics of the product do.[29]

Reliability and diversity of supply

For many consumers of silicon metal, security and reliability of supply are very important.[30] Seven purchasers reported that reliability of supply is an important factor in their purchasing decisions and three of those purchasers reported that it was first most important (see table II-5 above).Importer MPM stated that it is necessary to insure availability from a variety of sources so as to guarantee supply of high-quality silicon metal to produce silicones in the United States.[31] Importer REC Silicon stated that its sourcing strategy emphasizes the need to maintain multiple qualified suppliers for security of supply. It noted that prior to the merger of Globe and FerroAtlántica, it sourced from both firms as part of its diversity strategy, but since the merger, it has made the conscious decision to purchase less from FerroGlobe.[32]

Some consumers of silicon metal reported difficulties in obtaining sufficient quantities of silicon metal that matched their requirements. Purchaser WPNA stated that it had contracted with Globe to supply its full demand of silicon metal in 2016, but that Globe failed to supply the order in time, forcing WNPA to move to other suppliers. It also reached out to Mississippi, which was unable to fulfill WNPA's required quantities, so WNPA sourced from Australia.[33] Dow Corning stated that ***.[34] Respondents stated that Globe has a history of being an unreliable supplier of silicon metal, and has switched production from silicon metal to

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[27] Conference transcript, p. 20 (Perkins); Petitioner's postconference brief, p. 16.

[28] Conference transcript, p. 82 (Bowes); REC postconference brief, p. 2.

[29] MPM's postconference brief, p. 4.

[30] Conference transcript, p. 119 (Walters, Bowes); Joint Respondents' postconference brief, pp. 2, 4; Dow Corning's postconference brief, p. 12.

[31] Conference transcript, p. 85 (Moran); MPM's postconference brief, p. 4. MPM stated that while the Globe and FerroAtlántica merger has had no impact on its sourcing decisions to date, it could impact the firm's decision going forward. MPM's postconference brief, p. 7.

[32] Conference transcript, pp. 82, 91 (Bowes, Augusto); REC Silicon's postconference brief, p. 4.

[33] Conference transcript, p. 79 (Hudson).

[34] Dow Corning's postconference brief, p. 13.

ferrosilicon in response to market opportunities, leaving its silicon metal customers "in a lurch."[35]

Comparison of U.S.-produced and imported silicon metal

In order to determine whether U.S.-produced silicon metal can generally be used in the same applications as imports from Australia, Brazil, Kazakhstan, and Norway, U.S. producers and importers were asked whether the products can always, frequently, sometimes, or never be used interchangeably. As shown in table II-6, all U.S. producers and most importers reported that U.S.-produced product is always or frequently interchangeable with Australian or Norwegian product. Some U.S. producers and importers stated that U.S.-produced silicon metal is only sometimes interchangeable with silicon metal from Brazil and Kazakhstan.

U.S. producer *** and importer *** reported that Brazilian silicon metal has low levels of boron and phosphorus, which is necessary for the production of high-quality feed stocks for polysilicon production, and U.S. producer *** and importer *** reported that product from Kazakhstan is only sometimes interchangeable with silicon metal from Australia, Brazil, and Norway because of quality differences. U.S. importer *** reported that although imported and domestic silicon metal may have differences, it only imports product that is interchangeable with domestic product. U.S. importer *** reported that interchangeability of silicon metal depends mostly on a customer's chemical requirements, and interchangeability varies based on the producer.

[35] Joint Respondents' postconference brief, pp. 5, 21.

Table II-6
Silicon metal: Interchangeability between silicon metal produced in the United States and in other countries, by country pair

Country pair	U.S. Producers				U.S. importers			
	A	F	S	N	A	F	S	N
United States vs. Australia	***	***	***	***	4	4	2	0
United States vs. Brazil	***	***	***	***	3	5	4	0
United States vs. Kazakhstan	***	***	***	***	2	2	2	0
United States vs. Norway	***	***	***	***	3	4	2	0
Australia vs. Brazil	***	***	***	***	2	5	3	0
Australia vs. Kazakhstan	***	***	***	***	1	2	2	1
Australia vs. Norway	***	***	***	***	2	3	2	0
Brazil vs. Kazakhstan	***	***	***	***	1	3	3	0
Brazil vs. Norway	***	***	***	***	1	4	4	0
Kazakhstan vs. Norway	***	***	***	***	1	2	2	0
United States vs. Other	***	***	***	***	2	3	3	0
Australia vs. Other	***	***	***	***	1	3	3	0
Brazil vs. Other	***	***	***	***	1	3	4	0
Kazakhstan vs. Other	***	***	***	***	1	2	2	0
Norway vs. Other	***	***	***	***	1	3	3	0

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

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

U.S. importer *** reported that while other countries may produce silicon metal at a quality necessary for aluminum or chemical applications, there is only one Norwegian producer that offers specialty silicon powders for ceramic, brazing, batty, thermal spray, and other applications. This importer added that the U.S. producers offer similar quality to silicon metal produced in nonsubject countries, but U.S. producers offer a broader range of product; it also stated that Australian silicon metal tends to be higher quality than silicon metal from other nonsubject countries.

In addition, producers and importers were asked to assess how often differences other than price were significant in sales of silicon metal from the United States, subject, or nonsubject countries. As seen in table II-7, responses varied. *** U.S. producers reported that factors other than price were sometimes or never significant when comparing U.S.-produced silicon metal with silicon metal imported from subject countries. Equal numbers of importers reported that differences other than price are always or frequently significant, and sometimes or never significant in their sales.

Table II-7
Silicon metal: Significance of differences other than price between silicon metal produced in the United States and in other countries, by country pair

Country pair	U.S. Producers				U.S. importers			
	A	F	S	N	A	F	S	N
United States vs. Australia	***	***	***	***	3	1	2	2
United States vs. Brazil	***	***	***	***	5	0	3	2
United States vs. Kazakhstan	***	***	***	***	1	1	2	2
United States vs. Norway	***	***	***	***	3	1	2	2
Australia vs. Brazil	***	***	***	***	3	0	3	2
Australia vs. Kazakhstan	***	***	***	***	1	1	2	2
Australia vs. Norway	***	***	***	***	2	0	2	2
Brazil vs. Kazakhstan	***	***	***	***	2	1	2	2
Brazil vs. Norway	***	***	***	***	4	0	2	2
Kazakhstan vs. Norway	***	***	***	***	1	1	1	2
United States vs. Other	***	***	***	***	3	0	3	2
Australia vs. Other	***	***	***	***	2	0	3	2
Brazil vs. Other	***	***	***	***	3	0	3	2
Kazakhstan vs. Other	***	***	***	***	1	1	2	2
Norway vs. Other	***	***	***	***	2	0	3	2

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

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

U.S. producer *** and importer *** reported that there are long supply chains in Kazakhstan and Brazil. Importer *** also reported longer supply chains, irregular availability, and more limited product range for Kazakh silicon metal when compared to silicon metal from the United States and Norway. U.S. importers *** reported that availability, transportation, and timeliness of delivery are important. *** added that customer service, repeatability, and long-standing supplier relationships are significant non-price differences.

Three importers reported that both quality and predictability of supply are essential. *** reported that *** and adds that because of its sourcing strategy, it will buy from other suppliers as well to secure supply. Importer *** reported that by working directly with producers, it is able to ensure predictable supply and quality. The firm adds that U.S. producer Globe has insufficient capacity to supply the U.S. market and that it has been unreliable in the past when it has shifted production away from silicon metal to ferrosilicon.

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 subsidies and 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 three firms that accounted for virtually all U.S. production of silicon metal during 2016.

U.S. PRODUCERS

The Commission issued a U.S. producer questionnaire to three firms based on information contained in the petition and other available industry resources. Three firms provided usable data on their productive operations.[1] Table III-1 lists U.S. producers of silicon metal, their production locations, positions on the petition, and shares of total production.

Table III-1
Silicon metal: U.S. producers of silicon metal, their positions on the petition, production locations, and share of reported production, 2016

Firm	Position on petition	Production location(s)	Share of production (percent)
DC Alabama	***	Mt. Meigs, AL	***
Globe	Petitioner	Selma, AL Niagara Falls, NY Beverly, OH Alloy, WV	***
Mississippi	***	Burnsville, MS	***
Total			100.0

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

Related firms

Table III-2 presents information on U.S. producers' ownership, related and/or affiliated firms, and share of total production of silicon metal. Two U.S. producers, ***, are related to foreign producers in subject countries. These U.S. producers are also related to U.S. importers of the subject merchandise.[2]

[1] Mississippi started production in 2015 and therefore did not provide usable financial data for 2014.

[2] Globe suggests that DC Alabama is insulated from the negative impact of unfairly trade subject imports since it internally transfers silicon metal to its parent company for processing into downstream

(*continued*...)

Table III-2
Silicon metal: U.S. producers' ownership, related and/or affiliated firms

* * * * * * *

Changes in operations

Table III-3 presents U.S. producers' reported changes in operations since January 1, 2014.[3]

Table III-3
Silicon metal: U.S. producers' reported changes in operations, since January 1, 2014

* * * * * * *

In addition to changes in operations reported in questionnaires, respondents noted that Globe and Spanish firm FerroAtlántica announced its merger in 2015 to become an entity known as FerroGlobe.[4]

U.S. PRODUCTION, CAPACITY, AND CAPACITY UTILIZATION

Silicon metal

Table III-4 and figure III-1 present U.S. producers' production, capacity, and capacity utilization. Domestic producers' aggregate capacity increased by *** percent from 2014 to 2016.[5] Total production increased by *** percent from 2014 to 2016. The main reason for these increases in capacity and production is ***. Capacity utilization decreased from *** percent in 2014 to *** percent in 2015, and further decreased to *** percent in 2016.

(…*continued*)
products. Since the internally transferred silicon metal does not enter into the merchant market, Globe argues that DC Alabama should be excluded from the domestic industry as a related party. Petitioner's postconference brief, p. 7, n.30.

DC Alabama contends that it "should not be excluded from the domestic industry, as requested by the Petitioner. DC Alabama's primary interest lies in domestic production. DC Alabama imports when it cannot source sufficient volumes from the U.S. market, or when high-purity specifications require it." Dow Corning's postconference brief, p. 1.

[3] Mississippi ***. Petition, Vol I, exh. I-4.

[4] Conference transcript, p. 89 (Augusto); Joint Respondents' postconference brief, pp. 1, 23.

[5] Despite this overall increase, Globe contends that subject imports that undercut its prices caused it to shut down its plant in Selma, Alabama in addition to idling furnaces at other plants, converting a furnace to ferrous silicon production at another plant, and laying off workers. Conference transcript, pp. 22 (Perkins), 29 (Huck), 37 (Lutz).

Table III-4
Silicon metal: U.S. producers' production, capacity, and capacity utilization, 2014-16

* * * * * * *

Figure III-1
Silicon metal: U.S. producers' production, capacity, and capacity utilization, 2014-16

* * * * * * *

Alternative products

As shown in table III-5, U.S. producers reported that a majority of their production consisted of silicon metal. Production of in-scope silicon metal accounted for *** percent of total production during 2016. Two firms, ***, reported that they do not produce alternative products on the same equipment or using the same employees, while *** reported producing out-of-scope items on the same equipment as subject silicon metal. Production of out-of-scope products accounted for *** percent produced during 2016. These out-of-scope products include ***.[6]

Table III-5
Silicon metal: U.S. producers' overall capacity and production on the same equipment as subject production, 2014-16

* * * * * * *

Producers were asked about their ability to switch production between products. *** reported having the ability to shift production capacity between subject silicon metal and out-of-scope products, which include ***.

Producers were also asked to describe the constraint(s) that set the limit(s) of their production capacity. DC Alabama explained that ***. Globe and Mississippi also noted production constraints including ***.

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

Table III-6 presents U.S. producers' U.S. shipments, export shipments, and total shipments. Globe and Mississippi are merchant market producers while DC Alabama is a captive supplier for use of silicon metal in its own production processes.[7] These data show that the quantity of U.S. producers' total shipments, including both U.S. and export shipments,

[6] Globe noted that it is generally much easier to switch from silicon metal to ferrosilicon since the raw materials are adjusted. It is very difficult to switch back from ferrosilicon to silicon metal because the shell is contaminated and certain elements would need to be removed that are detrimental to silicon metal. Conference transcript, p. 41 (Huck).

[7] Conference transcript, pp. 12 (Kramer), 36 (Lutz). ***. ***.

increased by *** percent from 2014 to 2016. The value of U.S. producers' total shipments increased by *** percent from 2014 to 2015, but decreased by *** percent from 2015 to 2016. The value of U.S. producers' total shipments decreased overall by *** percent from 2014 to 2016. The average unit value of U.S. producers' total shipments increased by *** percent from 2014 to 2015, but decreased by *** percent from 2015 to 2016. The average unit value of U.S. producers' total shipments decreased overall by *** percent from 2014 to 2016.

Table III-6
Silicon metal: U.S. producers' U.S. shipments, exports shipments, and total shipments, 2014-16

* * * * * * *

*** of domestic producers' total shipments of silicon metal were U.S. commercial shipments and *** were transfers to related firms. *** accounted for all reported transfers to related firms,[8] while *** only reported U.S. commercial shipments.

*** reported export shipments of silicon metal that they produced in 2016. The quantity of exports shipments increased by *** percent from 2014 to 2016.[9] Principal export markets include ***.

Table III-7 and figure III-2 present U.S. producers' monthly U.S. shipments during 2014-16. These data show that there were substantial U.S. shipments in every month during 2014-16.

Table III-7
Silicon metal: U.S. producers' monthly U.S. shipments, 2014-16

* * * * * * *

Figure III-2
Silicon metal: U.S. producers' monthly U.S. shipments, 2014-16

* * * * * * *

Silicon metal is usually sold domestically in lump form, but may also be sold in powder form to chemical manufacturers that do not have their own grinding facilities.[10] Table III-8 and figure III-3 present U.S. producers' U.S. shipments by product form during 2014-16. These data indicate that the *** of U.S. producers' U.S. shipments were in lump form during 2014-16.

Table III-8
Silicon metal: U.S. producers' U.S. shipments by product form, 2014-16

* * * * * * *

[8] The vast majority of *** U.S. shipments were transfers to related firms, while the majority of *** U.S. shipments were U.S. commercial shipments.

[9] This increase in exports is due to *** exports in 2016.

[10] Petition, Vol. I, pp. 6, 12; conference transcript, pp. 43-44 (Perkins, Lutz).

Figure III-3
Silicon metal: U.S. producers' U.S. shipments by product form, 2016

* * * * * * *

U.S. PRODUCERS' INVENTORIES

Table III-9 presents U.S. producers' end-of-period inventories and the ratio of these inventories to U.S. producers' production, U.S. shipments, and total shipments during 2014-16**.** These data show that U.S. producers' inventories increased by *** percent from 2014 to 2015, but decreased by *** percent from 2015 to 2016. U.S. producers' inventories increased overall by *** percent from 2014 to 2016. U.S. producers' inventories were equivalent to between *** and *** percent of U.S. producers' total shipments during 2014-16. All domestic producers[11] reported holding end-of-period inventories of silicon metal. *** held lower inventories in December 2016 than in December 2014 and *** held higher inventories in December 2016 than in December 2014.

Table III-9
Silicon metal: U.S. producers' inventories, 2014-16

* * * * * * *

U.S. PRODUCERS' IMPORTS AND PURCHASES

U.S. producers' imports of silicon metal are presented in table III-10. U.S. producer *** is related to *** through a common parent, ***. This parent imported silicon metal from *** during 2014-16. ***.[12]

U.S. producer *** is related to *** through a related common parent. *** also imported silicon metal from *** during 2014-16.

Table III-10
Silicon metal: U.S. producers' direct imports, 2014-16

* * * * * * *

[11] ***.

[12] In addition, ***. Dow Corning's postconference brief, p. 6.

DC Alabama noted that it purchased its silicon metal facility in Brazil from Globe in addition to acquiring a 49 percent interest in Globe's plant in Alloy, West Virginia in 2009 in order to secure an efficient and stable supply of silicon metal for its production of silicone-based materials. Furthermore, DC Alabama ***. Dow Corning's postconference brief, pp. 13, 22, n.67, exh. 1, exh. 4, p. 6.

U.S. EMPLOYMENT, WAGES, AND PRODUCTIVITY

Table III-11 shows U.S. producers' employment-related data. U.S. producers' employment measured by PRWs increased by *** percent from 2014 to 2015, but decreased by *** percent from 2015 to 2016. U.S. producers' employment measured by PRWs increased overall by *** percent from 2014 to 2016. U.S. producers' total hours worked increased by *** percent from 2014 to 2016. U.S. producers' hourly wages decreased by *** percent from 2014 to 2016.

Unit labor costs increased by *** percent from 2014 to 2015, but decreased by *** percent from 2015 to 2016. Unit labor costs increased overall by *** percent from 2014 to 2016. Productivity decreased by *** percent from 2014 to 2016.

Table III-11
Silicon metal: U.S. producers' employment related data, 2014-16

* * * * * * *

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

U.S. IMPORTERS

The Commission issued importer questionnaires to 24 firms believed to be importers of subject silicon metal, as well as to all U.S. producers of silicon metal.[1] Usable questionnaire responses were received from 15 companies, representing *** U.S. imports from Australia, *** U.S. imports from Brazil, *** percent of U.S. imports from Kazakhstan, and *** percent of U.S. imports from Norway between January 1, 2014 to December 31, 2016 under HTS statistical reporting numbers 2804.69.1000 and 2804.69.5000.[2] In light of the slightly less-than-complete coverage of data from subject and nonsubject countries provided in Commission questionnaires, import data in this report are based on official Commerce statistics based on General Imports for silicon metal.[3] Table IV-1 lists all responding U.S. importers of silicon metal from Australia, Brazil, Kazakhstan, Norway, and other sources, their locations, and their shares of U.S. imports, in 2016.

[1] 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 HTS statistical reporting numbers 2804.69.1000 and 2804.69.5000 in 2016.

[2] The coverage estimates presented are based on official import statistics.

[3] General Imports measures the total physical arrivals of merchandise from foreign countries, whether such merchandise enters the U.S. customs territory immediately or is entered into bonded warehouses or FTZs under Customs custody.

Table IV-1
Silicon metal: U.S. importers, their headquarters, and share of total imports by source, 2016

Firm	Headquarters	Share of U.S. imports (percent) from						
		Australia	Brazil	Kazakhstan	Norway	Subject sources	Nonsubject sources	All import sources
CCMA[1]	Amherst, NY	***	***	***	***	***	***	***
Derby	Harrow, United Kingdom	***	***	***	***	***	***	***
Dow Corning[2]	Midland, MI	***	***	***	***	***	***	***
Elkem Materials Inc.[3]	Moon Township, PA	***	***	***	***	***	***	***
FerroAtlántica[4]	Madrid, Spain	***	***	***	***	***	***	***
Greenwich Metals Inc.	Greenwich, CT	***	***	***	***	***	***	***
Medima	Clarence, NY	***	***	***	***	***	***	***
MPM[5]	Waterford, NY	***	***	***	***	***	***	***
MPSAC[6]	Theodore, AL	***	***	***	***	***	***	***
Panadyne Inc.	Montgomeryville, PA	***	***	***	***	***	***	***
Polymet[7]	Birmingham, AL	***	***	***	***	***	***	***
REC Silicon Inc.	Moses Lake, WA	***	***	***	***	***	***	***
Simcoa[8]	Wellesley, Western Australia	***	***	***	***	***	***	***
Standard Resources Corporation	Cherry Hill, NJ	***	***	***	***	***	***	***
Tennant Metallurgical Group Ltd.[9]	Sheffield, United Kingdom	***	***	***	***	***	***	***
Total		100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] CCMA is ***.
[2] Dow Corning is ***.
[3] Elkem Materials Inc. is ***.
[4] FerroAtlántica is ***.
[5] MPM is ***.
[6] MPSAC is ***.
[7] Polymet is ***.
[8] Simcoa is ***.
[9] Tennant Metallurgical Group Ltd. Is ***.

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

U.S. IMPORTS

Table IV-2 presents data for U.S. imports of silicon metal from Australia, Brazil, Kazakhstan, Norway, and all other sources. The quantity of silicon metal imports from the

subject countries decreased by 22.9 percent from 2014 to 2015,[4] but increased by 22.1 percent from 2015 to 2016. The quantity of silicon metal imports from the subject countries decreased overall by 5.8 percent during 2014-16. The cost, insurance, and freight ("CIF") value of silicon metal imports from the subject countries decreased by 23.5 percent from 2014 to 2016. As a share of total imports, subject imports decreased from 56.0 percent in 2014 to 50.8 percent in 2015, but increased to 66.9 percent in 2016. The average unit values of silicon metal imports from the subject countries, which were higher than those reported for nonsubject imports in 2014 but lower than those reported for nonsubject imports in 2015 and 2016, increased by 0.5 percent from 2014 to 2015 but decreased by 19.1 percent from 2015 to 2016.

Table IV-2
Silicon metal: U.S. imports by source, 2014-16

Item	Calendar year		
	2014	2015	2016
	Quantity (short tons contained silicon)		
U.S. imports from.--			
Australia	19,977	22,046	18,459
Brazil	83,725	51,888	68,340
Kazakhstan	0	3,006	10,367
Norway	14,753	14,399	14,398
Subject sources	118,455	91,340	111,564
Nonsubject sources	93,105	88,455	55,090
All import sources	211,560	179,795	166,655
	CIF value (1,000 dollars)		
U.S. imports from.--			
Australia	52,516	58,984	34,586
Brazil	219,760	140,482	158,897
Kazakhstan	0	6,691	17,441
Norway	42,151	37,401	29,771
Subject sources	314,427	243,557	240,694
Nonsubject sources	238,782	236,561	126,834
All import sources	553,210	480,118	367,528
	Unit value (dollars per STCS)		
U.S. imports from.--			
Australia	2,629	2,676	1,874
Brazil	2,625	2,707	2,325
Kazakhstan	0	2,226	1,682
Norway	2,857	2,597	2,068
Subject sources	2,654	2,667	2,157
Nonsubject sources	2,565	2,674	2,302
All import sources	2,615	2,670	2,205

Table continued on next page.

[4] Globe noted that the decline in imports was due to Brazil in 2015 as a result of severe energy shortages that restricted silicon metal production in Brazil that year. Petitioner's postconference brief, p. 32.

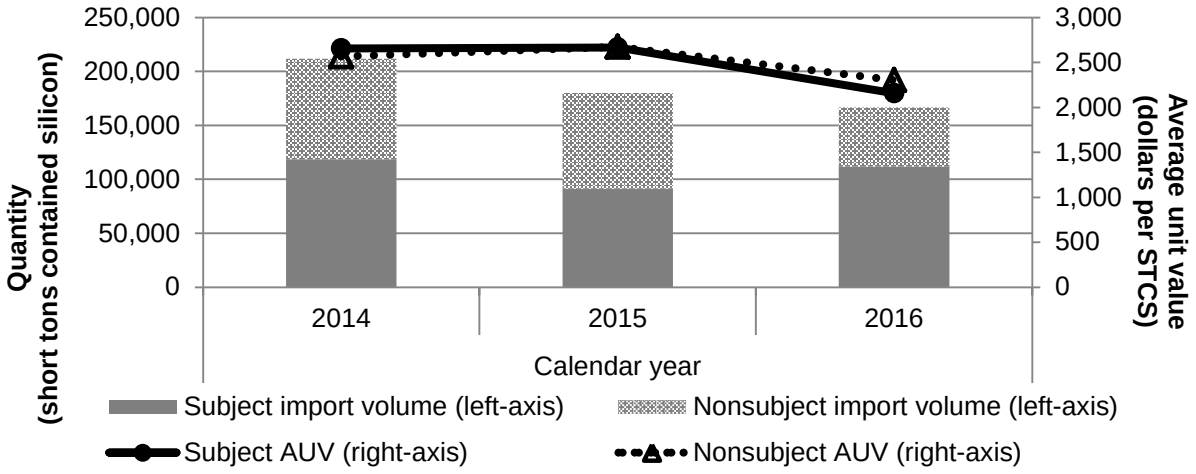
Table IV-2 -- Continued
Silicon metal: U.S. imports by source, 2014-16

Item	Calendar year		
	2014	2015	2016
	Share of quantity (percent)		
U.S. imports from.--			
Australia	9.4	12.3	11.1
Brazil	39.6	28.9	41.0
Kazakhstan	0.0	1.7	6.2
Norway	7.0	8.0	8.6
Subject sources	56.0	50.8	66.9
Nonsubject sources	44.0	49.2	33.1
All import sources	100.0	100.0	100.0
	Share of value (percent)		
U.S. imports from.--			
Australia	9.5	12.3	9.4
Brazil	39.7	29.3	43.2
Kazakhstan	0.0	1.4	4.7
Norway	7.6	7.8	8.1
Subject sources	56.8	50.7	65.5
Nonsubject sources	43.2	49.3	34.5
All import sources	100.0	100.0	100.0
	Ratio to U.S. production		
U.S. imports from.--			
Australia	***	***	***
Brazil	***	***	***
Kazakhstan	***	***	***
Norway	***	***	***
Subject sources	***	***	***
Nonsubject sources	***	***	***
All import sources	***	***	***

Note.--U.S. importers ***. ***. U.S. importers ***. ***.

Source: Official U.S. imports based on General Imports using statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed on March 16, 2017.

Figure IV-1
Silicon metal: U.S. imports by source, 2014-16



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

The quantity of silicon metal imports from all nonsubject countries decreased by 40.8 percent from 2014 to 2016. The CIF value of silicon metal imports from all nonsubject countries followed a similar trend, decreasing by 46.9 percent from 2014 to 2016. The average unit value of silicon metal imports from nonsubject countries increased by 4.3 percent from 2014 to 2015, but decreased by 13.9 percent from 2015 to 2016. The average unit value of silicon metal imports from nonsubject countries decreased overall by 10.2 percent during 2014-16.

The ratio of subject import volume to U.S. production decreased from *** percent in 2014 to *** percent in 2015, but increased to *** percent in 2016. The ratio of total import volume to U.S. production decreased from *** percent in 2014 to *** in 2015, and further decreased to *** percent in 2016.

NEGLIGIBILITY

The statute requires that an investigation be terminated without an injury determination if imports of the subject merchandise are found to be negligible.[5] 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

[5] 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)).

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.[6] In the case of countervailing duty investigations involving developing countries, the negligibility limits are 4 percent and 9 percent rather than 3 percent and 7 percent.[7] Although the petition in these investigations includes countervailing duty allegations on three countries (Australia, Brazil, and Kazakhstan), only Brazil and Kazakhstan have been designated as developing countries by the U.S. Trade Representative.

The quantity of U.S. imports in the twelve month period preceding the filing of the petitions (March 2016 to February 2017) and the share of quantity of total U.S. imports for which each accounted are presented in table IV-3. Imports from Australia, Brazil, Kazakhstan, and Norway accounted for 10.6 (17,877 short tons), 46.0 (77,490 short tons), 5.9 (10,027 short tons), and 8.4 percent (14,216 short tons), respectively, of total imports of silicon metal by quantity during March 2016 to February 2017. Imports from all four subject countries combined accounted for 71.0 percent of total imports during March 2016 to February 2017.[8]

Table IV-3
Silicon metal: U.S. imports in the twelve month period preceding the filing of the petition, March 2016 through February 2017

Item	March 2016 through February 2017	
	Quantity (short tons contained silicon)	Share of quantity (percent)
U.S. imports from.--		
Australia	17,877	10.6
Brazil	77,490	46.0
Kazakhstan	10,027	5.9
Norway	14,216	8.4
Subject sources	119,610	71.0
Nonsubject sources	48,918	29.0
All import sources	168,528	100.0

Source: Official U.S. imports based on General Imports using statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed on April 5, 2017.

CUMULATION CONSIDERATIONS

In assessing whether imports should be cumulated, the Commission determines whether U.S. imports from the subject countries compete with each other and with the domestic like product and has generally considered four factors: (1) fungibility, (2) presence of sales or offers to sell in the same geographical markets, (3) common or similar channels of

[6] Section 771 (24) of the Act (19 U.S.C § 1677(24)).
[7] Section 771 (24) of the Act (19 U.S.C § 1677(24)(B)).
[8] Shares are calculated based on official import statistics.

distribution, and (4) simultaneous presence in the market. Additional information concerning fungibility, geographical markets, and simultaneous presence in the market is presented below.

Fungibility

Similar to domestically produced silicon metal, imported silicon metal is generally sold in lump form, but can also be sold in powder form.[9] Table IV-4 presents U.S. importers' U.S. shipments from each subject country and nonsubject sources of silicon metal in lump form as compared to powder form during 2014-16.[10] These data show that the majority of U.S. shipments of U.S. imports from both subject and nonsubject sources were shipped in lump form during 2014-16 except for U.S. shipments of silicon metal imported from ***, which were generally shipped in powder form.

Table IV-4
Silicon metal: U.S. importers' U.S. shipments by product form, 2014-16

* * * * * * *

Figure IV-2
Silicon metal: U.S. producers' and U.S. importers' U.S. shipments by product form, 2016

* * * * * * *

Table IV-5 presents a comparison of domestic and subject supplies in 2016. U.S. shipments of imported silicon metal from *** were primarily for internal consumption, and for end uses including chemical producers and polysilicon producers in 2016. U.S. shipments of *** were primarily shipped to aluminum producers. Silicon metal is primarily shipped in lump form with the exception of shipments imported from ***, which were primarily shipped in powder form.

Table IV-5
Silicon metal: Comparison of domestic and subject supplies, 2016

* * * * * * *

[9] Petition, Vol. I, p. 12; conference transcript, pp. 43-44 (Perkins, Lutz).

[10] Brazilian respondents note that almost all silicon metal production in Brazil is in lump form. Only RIMA supplies silicon metal in powder form to REC Silicon, since it requires a specialized high quality product. Brazilian respondents' postconference brief, p. 5.

Geographical markets

According to Commission questionnaire responses, silicon metal production occurs in the Eastern and Southern geographic regions of the United States. Silicon metal is generally shipped nationwide, with the exception of geographic market areas served by U.S. importers from Australia, which do not ship to the Central Southwest and Mountains geographic U.S. market areas.

As illustrated in table IV-6, U.S. Customs districts located in the North[11] accounted for 35.1 percent, the largest share of the imports of silicon metal from the subject countries during 2016, whereas U.S. Customs districts located in the East,[12] South,[13] and West[14] accounted for smaller shares (28.3 percent, 22.0 percent, and 14.7 percent of imports from the subject countries, respectively).

[11] The "North" includes the following Customs entry districts: Chicago, Illinois; Cleveland, Ohio; Detroit, Michigan; Duluth, Minnesota; Great Falls, Montana; Milwaukee, Wisconsin; Minneapolis, Minnesota; and Pembina, North Dakota.The "South" includes the following Customs entry districts: Dallas-Fort Worth, Texas; El Paso, Texas; Houston-Galveston, Texas; Laredo, Texas; Miami, Florida; Mobile, Alabama; New Orleans, Louisiana; and Tampa, Florida.

[12] The "East" includes the following Customs entry districts: Baltimore, Maryland; Boston, Massachusetts; Buffalo, New York; Charleston, South Carolina; Charlotte, North Carolina; New York, New York; Norfolk, Virginia; Ogdensburg, New York; Philadelphia, Pennsylvania; Portland, Maine; San Juan, Puerto Rico; Savannah, Georgia; St. Albans, Vermont; and Washington, District of Columbia.

[13] The "South" includes the following Customs entry districts: Dallas-Fort Worth, Texas; El Paso, Texas; Houston-Galveston, Texas; Laredo, Texas; Miami, Florida; Mobile, Alabama; New Orleans, Louisiana; and Tampa, Florida.

[14] The "West" includes the following Customs entry districts: Columbia-Snake, Oregon; Honolulu, Hawaii; Los Angeles, California; Nogales, Arizona; San Diego, California; San Francisco, California; and Seattle, Washington.

Table IV-6
Silicon metal: U.S. imports, by source and border of entry, 2016

Item	Border of entry				
	East	North	South	West	Total
	Quantity (short tons contained silicon)				
U.S. imports from.--					
Australia	12,525	0	0	5,933	18,459
Brazil	4,947	38,899	16,619	7,875	68,340
Kazakhstan	6,839	104	1,890	1,535	10,367
Norway	7,239	101	6,053	1,005	14,398
Subject sources	31,550	39,104	24,563	16,347	111,564
Nonsubject sources	27,549	21,687	5,459	394	55,090
All import sources	59,099	60,791	30,022	16,742	166,655
	Share of quantity across (percent)				
U.S. imports from.--					
Australia	67.9	0.0	0.0	32.1	100.0
Brazil	7.2	56.9	24.3	11.5	100.0
Kazakhstan	66.0	1.0	18.2	14.8	100.0
Norway	50.3	0.7	42.0	7.0	100.0
Subject sources	28.3	35.1	22.0	14.7	100.0
Nonsubject sources	50.0	39.4	9.9	0.7	100.0
All import sources	35.5	36.5	18.0	10.0	100.0
	Share of quantity down (percent)				
U.S. imports from.--					
Australia	21.2	0.0	0.0	35.4	11.1
Brazil	8.4	64.0	55.4	47.0	41.0
Kazakhstan	11.6	0.2	6.3	9.2	6.2
Norway	12.2	0.2	20.2	6.0	8.6
Subject sources	53.4	64.3	81.8	97.6	66.9
Nonsubject sources	46.6	35.7	18.2	2.4	33.1
All import sources	100.0	100.0	100.0	100.0	100.0

Source: Official U.S. imports based on General Imports using statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed on March 16, 2017.

Presence in the market

Table IV-7 presents monthly U.S. imports during 2014-16. These data show that imports of silicon metal were present in the U.S. market in every month during the period examined from January 2014 to December 2016 for every subject country except Kazakhstan. With respect to Kazakhstan, there were zero imports present in the U.S. market in 2014. Imports of silicon metal from Kazakhstan were present in 8 months in 2015, and 12 months in 2016.

Table IV-7
Silicon metal: Monthly U.S. imports, 2014-16

Item	Calendar year					
	2014	2015	2016	2014	2015	2016
	Quantity (short tons contained silicon)					
	AUSTRALIA			BRAZIL		
January	2,161	1,680	1,975	9,385	5,257	2,123
February	1,653	1,183	1,401	9,306	5,076	1,057
March	751	2,520	2,513	8,150	2,926	6,538
April	2,015	1,645	1,324	5,093	7,182	3,411
May	1,669	1,909	1,110	5,666	3,704	3,133
June	1,499	2,114	1,382	7,472	5,421	8,954
July	2,182	1,663	1,498	8,985	5,668	7,421
August	1,722	3,191	2,196	4,930	3,571	8,964
September	1,681	1,145	1,276	6,420	1,888	5,522
October	1,785	1,587	1,329	8,358	2,562	5,895
November	1,312	2,076	847	4,168	5,090	9,485
December	1,547	1,333	1,609	5,793	3,543	5,837
Annual U.S. imports	19,977	22,046	18,459	83,725	51,888	68,340
	KAZAKHSTAN			NORWAY		
January	0	482	1,641	783	2,040	906
February	0	0	982	344	951	1,034
March	0	300	678	873	2,032	649
April	0	0	836	862	740	1,633
May	0	0	770	1,209	1,143	904
June	0	437	766	615	961	1,309
July	0	0	871	765	1,419	1,572
August	0	329	771	1,752	940	1,845
September	0	84	325	1,344	1,044	1,543
October	0	219	1,082	948	1,064	1,190
November	0	219	1,101	3,488	978	772
December	0	937	545	1,771	1,089	1,041
Annual U.S. imports	0	3,006	10,367	14,753	14,399	14,398

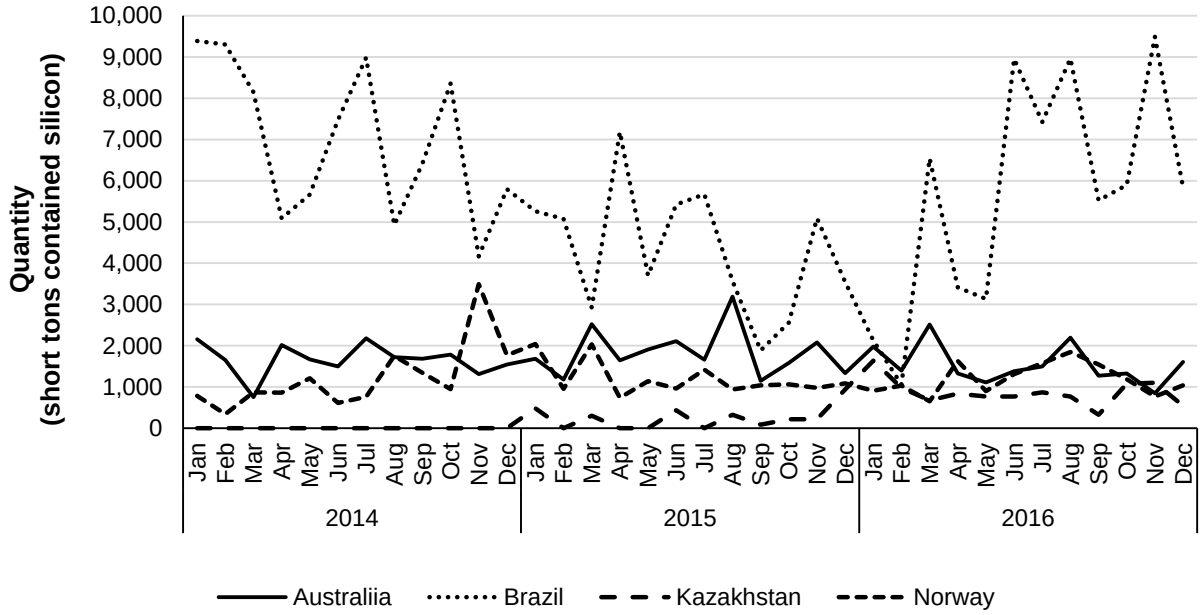
Table continued on next page.

Table IV-7 -- Continued
Silicon metal: Monthly U.S. imports, 2014-16

Item	Calendar year					
	2014	2015	2016	2014	2015	2016
	Quantity (short tons contained silicon)					
	SUBJECT SOURCES			NONSUBJECT SOURCES		
January	12,328	9,459	6,645	5,620	7,820	7,563
February	11,302	7,211	4,474	3,938	8,312	5,943
March	9,774	7,778	10,377	10,541	8,828	7,528
April	7,970	9,567	7,205	6,552	7,392	4,545
May	8,544	6,755	5,916	8,862	7,196	8,510
June	9,586	8,933	12,411	6,770	8,306	2,799
July	11,932	8,750	11,363	7,847	7,562	3,817
August	8,404	8,030	13,776	7,637	7,294	2,577
September	9,445	4,160	8,666	11,381	5,274	2,548
October	11,090	5,432	9,496	4,890	5,367	4,499
November	8,967	8,363	12,204	7,841	7,339	2,843
December	9,112	6,902	9,032	11,226	7,765	1,920
Annual U.S. imports	118,455	91,340	111,564	93,105	88,455	55,090
	ALL IMPORT SOURCES					
January	17,948	17,278	14,208			
February	15,240	15,523	10,416			
March	20,314	16,607	17,905			
April	14,522	16,959	11,750			
May	17,406	13,951	14,426			
June	16,356	17,239	15,210			
July	19,779	16,312	15,180			
August	16,041	15,324	16,353			
September	20,825	9,434	11,213			
October	15,980	10,799	13,994			
November	16,809	15,701	15,047			
December	20,338	14,668	10,952			
Annual U.S. imports	211,560	179,795	166,655			

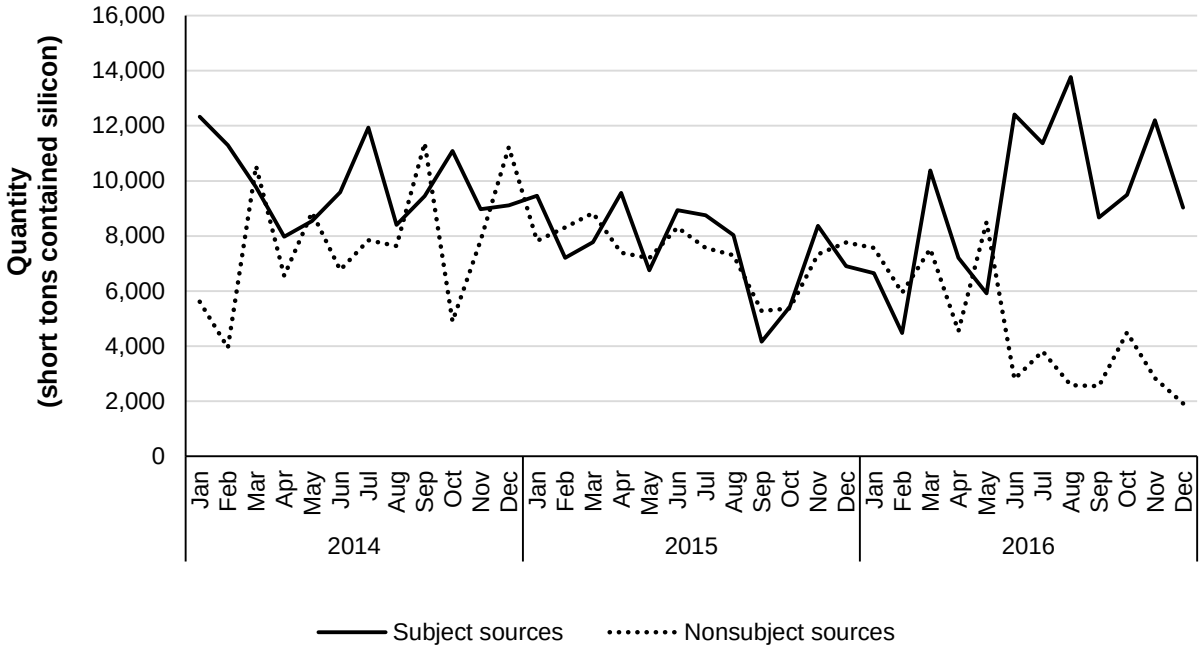
Source: Official U.S. imports based on General Imports using statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed on March 16, 2017.

Figure IV-3
Silicon metal: Monthly U.S. imports from subject sources by source, January 2014 through December 2016



Source: Official U.S. imports based on General Imports using statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed on March 16, 2017.

Figure IV-4
Silicon metal: Monthly U.S. imports by source, January 2014 through December 2016



Source: Official U.S. imports based on General Imports using statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed on March 16, 2017.

APPARENT U.S. CONSUMPTION

Table IV-8 and figure IV-5 present data on apparent U.S. consumption for silicon metal during 2014-16.[15] Apparent U.S. consumption based on quantity decreased by *** percent from 2014 to 2015, but increased by *** percent from 2015 to 2016. Apparent U.S. consumption based on quantity decreased overall by *** percent from 2014 to 2016. Apparent U.S. consumption based on value decreased by *** percent from 2014 to 2016.

Table IV-8
Silicon metal: U.S. shipments of domestic product, U.S. shipments of imports, and apparent U.S. consumption, 2014-16

Item	Calendar year		
	2014	2015	2016
	Quantity (short tons contained silicon)		
U.S. producers' U.S. shipments	***	***	***
U.S. imports from.--			
Australia	19,977	22,046	18,459
Brazil	83,725	51,888	68,340
Kazakhstan	0	3,006	10,367
Norway	14,753	14,399	14,398
Subject sources	118,455	91,340	111,564
Nonsubject sources	93,105	88,455	55,090
All import sources	211,560	179,795	166,655
Apparent U.S. consumption	***	***	***
	Value (1,000 dollars)		
U.S. producers' U.S. shipments	***	***	***
U.S. imports from.--			
Australia	52,516	58,984	34,586
Brazil	219,760	140,482	158,897
Kazakhstan	0	6,691	17,441
Norway	42,151	37,401	29,771
Subject sources	314,427	243,557	240,694
Nonsubject sources	238,782	236,561	126,834
All import sources	553,210	480,118	367,528
Apparent U.S. consumption	***	***	***

Source: Compiled from data submitted in response to Commission questionnaires and official U.S. imports based on General Imports using statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed on March 16, 2017.

Figure IV-5
Silicon metal: Apparent U.S. consumption, 2014-16

* * * * * * *

[15] Data for monthly apparent U.S. consumption are presented in app. D.

U.S. MARKET SHARES

Table IV-9 presents U.S. market share data for silicon metal. These data show that U.S. producers' market share based on quantity increased by *** percentage points from 2014 to 2016. U.S. producers' market share, based on value, increased by *** percentage points from 2014 to 2016. The market share of imports of silicon metal from the subject countries decreased by *** percentage points from 2014 to 2015, but increased by *** percentage points from 2015 to 2016.

Table IV-9
Silicon metal: U.S. consumption and market shares, 2014-16

* * * * * * *

PART V: PRICING DATA

FACTORS AFFECTING PRICES

Raw material costs

Silicon metal is produced from mined quartz containing a high percentage of silica and low iron content, charcoal or woodchips, and electrodes.[1] The quality of raw materials used in the production of silicon metal determines the quality of silicon metal, and thus whether silicon metal can satisfy specific requirements of various end users.[2] U.S. producers reported that raw materials as a share of cost of goods sold increased from *** percent in 2014 to *** percent in 2016. *** U.S. producers and four of eight responding importers reported that raw material costs had fluctuated since 2014; *** two of eight importers reported that raw material costs had increased.

U.S. producer *** and importer *** reported that raw material prices generally do not move in concert with silicon metal prices, but rather that each material is more affected by the conditions in its own market. U.S. importer *** reported that exchange rates have affected the price of carbon electrodes and low ash coal.

Petitioner stated that raw material prices during 2014-2016 have remained relatively flat, but that coal prices have increased slightly, and that they do not anticipate large changes in the future.[3] Respondents stated that electricity is the largest cost item in silicon metal production, and that U.S. industrial electricity prices declined in 2015 and 2016.[4] Data from the U.S. Energy Information Administration show that the average retail price of electricity in the industrial sector declined from 7.1 cents per kilowatthour in 2014 to 6.75 cents in 2016.[5]

U.S. inland transportation costs

All U.S. producers and most importers (8 of 10) reported that they typically arrange transportation to their customers. U.S. producers reported that their U.S. inland transportation costs were 2 to 3 percent while importers reported costs of 1 to 4 percent. Five of nine importers reported that they shipped silicon metal from storage, and four reported that they shipped from the point of importation.

According to respondents, in most cases, U.S. producers have a cost advantage over imports due to high freight costs in the United States and silicon metal consumers' need for

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[1] Petitioner's postconference brief, *Appendix A,* p. 12.

[2] Conference transcript, p. 76-77 (Hudson). See part II for further discussion of raw material quality.

[3] Conference transcript, p. 54 (Huck). However, Petitioner stated that raw material prices do not dictate sales price. Conference transcript, p. 54 (Perkins).

[4] Conference transcript, p. 73 (Kirgiz).

[5] U.S. Energy Information Administration, *Average retail price of electricity (annual),* accessed April 17, 2017.

just-in-time deliveries.[6] Importer and consumer REC Silicon stated that in contrast to other silicon metal consumers that are located closer to silicon metal production in the Eastern or Midwestern regions of the United States, its facilities are in Montana and Washington, so the transportion cost of imported silicon metal from the West Coast is almost three times less than shipping domestically produced silicon metal across the continental United States.[7]

PRICING PRACTICES

Pricing methods

Contract prices are sometimes determined based on a formula that accounts for published price indexes (figure V-1).[8] This published price data is readily available to purchasers, and purchasers will often share competing prices during negotiations with suppliers.[9] The published index reflects a product that is likely to be sold to secondary aluminum producers, but purchasers in all sectors reference these indices.[10] There are no published price series data for chemical or polysilicon grade silicon metal.[11]

Figure V-1
Silicon metal: Published price index of silicon metal, *, January 2014-December 2016**

* * * * * * *

U.S. producers and importers reported using transaction-by-transaction negotiations and contracts as their primary pricing methods. As presented in table V-1, *** U.S. producers sell primarily on a transaction-by-transaction basis, while most importers (9 of 10) sell primarily through contracts. Most contracts are negotiated or competitively bid during the fourth quarter for shipments in the following year.[12] A large number of importers also sell silicon metal through transaction-by-transaction negotiations.

[6] Joint respondents' postconference brief, p. 5.

[7] Conference transcript, pp. 83, 119-20, 122 (Bowes, Stoel, Lewis); REC postconference brief, p. 5.

[8] There is an increasingly common practice of contract setting price formulas that discount published prices for both U.S. producers and importers which results in steeply declining prices. Conference transcript, pp. 32, 36, 60-61, 92 (Lutz, Kramer, Augusto).

[9] Conference transcript, p. 20 (Perkins).

[10] Conference transcript, pp. 63, 134 (Lutz, Stoel).

[11] Joint respondents' postconference brief, *Exhibit 1.*

[12] Conference transcript, p. 23 (Perkins).

Table V-1
Silicon metal: U.S. producers' and importers' reported price setting methods, by number of responding firms[1]

Method	U.S. producers	U.S. importers
Transaction-by-transaction	***	6
Contract	***	9
Set price list	***	0
Other[1]	***	4
Total responding firms	**3**	**10**

[1] Other pricing methods include pricing based on published indexes.

Note.--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 reported selling the vast majority of their production under contracts of varying duration, although ***. Most importers reported selling silicon metal primarily under annual contracts (table V-2).

Table V-2
Silicon metal: U.S. producers' and importers' shares of U.S. commercial shipments by type of sale, 2016

Item	U.S. producers	Subject U.S. importers
	Share (percent)	
Share of commercial U.S. shipments.--		
Long-term contracts	***	***
Annual contract	***	***
Short-term contracts	***	***
Spot sales	***	***

Note.-- Because of rounding, figures may not add to the totals shown.

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

U.S. producers *** reported that their short-term contracts were for six months or less, and *** reported that its long-term contracts last for three years. Three importers (***) reported that their short-term contracts were for three months or less, and importer *** reported that its long-term contracts last for three years. U.S. producers do not allow for price renegotiation, nor do they provide meet-or-release provisions. Two importers (***) reported allowing for price renegotiations, and *** reported also providing meet-or-release provisions. Contracts with importer *** fix price, with *** fix quantity, and with six importers (***) fix both price and quantity.

Sales terms and discounts

Most U.S. producers and importers typically quote prices on a delivered basis. U.S. producers and importers reported having no discount policy. All U.S. producers and importers reported sales terms of net 30 days, with some variation.[13]

PRICE DATA

The Commission requested U.S. producers and importers to provide quarterly data for the total quantity and f.o.b. value of the following silicon metal products shipped to unrelated U.S. customers during 2014-16.

Product 1.-- Sold to primary aluminum producers; silicon metal less than 99.99% pure that contains a minimum of 98.5% silicon, a maximum of 1.00% iron, a maximum of 0.07% calcium, and no restriction of the aluminum content.

Product 2.-- Sold to secondary aluminum producers; silicon metal less than 99.99% pure that contains a minimum of 97.0% silicon, a maximum of 2.00% iron, a maximum of 0.4% calcium, and no restriction of the aluminum content.

Product 3.-- Sold to chemical manufacturers; silicon metal less than 99.99% pure that contains a minimum of 98.0% silicon, a maximum of 1.50% iron, a maximum of 0.2% calcium, and a maximum of 0.4% aluminum.

All three U.S. producers and seven importers provided usable pricing data for sales of the requested products, although not all firms reported pricing for all products for all quarters.[14]

Pricing data reported by these firms accounted for approximately 96 percent of U.S. producers' U.S. shipments of silicon metal in 2016. Pricing data reported by importers accounted for approximately *** percent of U.S. shipments of subject imports from Australia, *** percent of U.S. shipments of subject imports from Brazil, virtually all of U.S. shipments of subject imports from Kazakhstan, and *** percent of U.S. shipments of subject imports from Norway in 2016.

Price data for products 1-3 are presented in tables V-3 to V-5 and figures V-2 to V-4. Nonsubject country prices are presented in Appendix E.

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[13] U.S. producers *** reported sales terms of 45 days, and six importers also reported sales terms of net 60 days.

[14] 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.

Table V-3
Silicon metal: Weighted-average f.o.b. prices and quantities of domestic and imported product 1[1] and margins of underselling/(overselling), by quarters, January 2014-December 2016

* * * * * * *

Table V-4
Silicon metal: Weighted-average f.o.b. prices and quantities of domestic and imported product 2[1] and margins of underselling/(overselling), by quarters, January 2014-December 2016

* * * * * * *

Table V-5
Silicon metal: Weighted-average f.o.b. prices and quantities of domestic and imported product 3[1] and margins of underselling/(overselling), by quarters, January 2014-December 2016

* * * * * * *

Figure V-2
Silicon metal: Weighted-average f.o.b. prices and quantities of domestic and imported product 1[1] and margins of underselling/(overselling), by quarters, January 2014-December 2016

* * * * * * *

Figure V-3
Silicon metal: Weighted-average f.o.b. prices and quantities of domestic and imported product 2[1] and margins of underselling/(overselling), by quarters, January 2014-December 2016

* * * * * * *

Figure V-4
Silicon metal: Weighted-average f.o.b. prices and quantities of domestic and imported product 3[1] and margins of underselling/(overselling), by quarters, January 2014-December 2016

* * * * * * *

Price trends

In general, prices decreased during 2014-2016. Table V-6 summarizes the price trends, by country and by product. As shown in the table, domestic price decreases ranged from *** percent to *** percent during 2014-16 while import price decreases ranged from *** percent to *** percent.

Table V-6
Silicon metal: Number of quarters containing observations, low price, high price and change in price over period by product and source, January 2014-December 2016

Item	Number of quarters	Low price (dollars per short ton)	High price (dollars per short ton)	Change in price over period[1] (percent)
Product 1:				
United States	***	***	***	***
Australia	***	***	***	***
Brazil	***	***	***	***
Product 2:				
United States	***	***	***	***
Australia	***	***	***	***
Brazil	***	***	***	***
Kazakhstan	***	***	***	---
Norway	***	***	***	***
Product 3:				
United States	***	***	***	***
Australia	***	***	***	---
Brazil	***	***	***	***

[1] Percentage change from the first quarter in 2014 in which data were available to the last quarter in 2016 in which price data were available.

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

Although prices declined overall during 2014-2016, timing varied by product. Product 1 prices were relatively stable during 2014, fluctuated in 2015, and generally declined in 2016. Product 2 prices increased slightly during 2014, declined in the first half of 2015, and stabilized in the first half of 2016. Prices of product 3, the largest volume product, generally fluctuated with slight increases during 2014 and 2015, and generally declined in the last quarter of 2015 and during 2016.

Petitioner stated that because prices for 2015 had largely been set during contract negotiations in Q4 2014, price declines were not truly reflected until 2016.[15] Respondents alleged that negotiations during this period were adversely affected by Globe's merger with FerroAtlántica, the entry of U.S. producer Mississippi, and lower production costs.[16] Petitioner stated that although Brazilian imports were constrained in 2015 because of a power crisis, they entered the spot market at low prices and further drove down the published prices in 2016.[17]

[15] Conference transcript, p. 59 (Lutz).

[16] Conference transcript, pp. 69, 71, 73, 79, 92 (Lewis, Kirgiz, Hudson, Augusto); Joint respondents' postconference brief, pp. 18, 34, 36.

[17] Conference transcript, p. 62 (Schaefermeier). Import data from the Commission's questionnaires show that imports of silicon metal from Brazil decreased by *** percent during 2014-16.

Respondents stated that prices in 2017 and 2018 are projected *** and because of the positive market outlook for 2017, the petitioner informed its investors that it was removing its discounts to price indexes in its contracts.[18]

Price comparisons

As shown in table V-7, prices for silicon metal imported from subject countries were below those for U.S.-produced silicon metal in 51 of 75 instances (87,460 short tons); margins of underselling ranged from 0.1 to 40.7 percent. In the remaining 24 instances (36,513 short tons), prices for silicon metal from subject countries were between 0.1 and 25.6 percent above prices for the domestic product.

Table V-7
Silicon metal: Instances of underselling/overselling and the range and average of margins, by country, January 2014-December 2016

Source	Underselling				
	Number of quarters	Quantity (short tons)	Average margin (percent)	Margin Range (percent)	
				Min	Max
Australia	22	***	***	***	***
Brazil	16	***	***	***	***
Kazakhstan	5	***	***	***	***
Norway	8	***	***	***	***
Total, underselling	51	87,460	8.0	0.1	40.7
Source	(Overselling)				
	Number of quarters	Quantity (short tons)	Average margin (percent)	Margin Range (percent)	
				Min	Max
Australia	3	***	***	***	***
Brazil	16	***	***	***	***
Kazakhstan	3	***	***	***	***
Norway	2	***	***	***	***
Total, overselling	24	36,513	(6.2)	(0.1)	(25.6)

These data include only quarters in which there is a comparison between the U.S. and subject product.

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

Direct import purchase costs

Five importers[19] reported importing silicon metal from subject countries for internal use since January 1, 2014, and four of those importers provided usable import purchase cost data

[18] Joint respondents' postconference brief, p. 19.

for pricing product 3.[20] [21] Import cost data reported by these firms accounted for approximately virtually all imports for internal consumption from Australia, Brazil, and Norway and are shown in table V-8 and figure V-4. No importer reported purchase cost data for silicon metal from Kazakhstan.

Importers were asked about factors that add to the cost of directly importing. Importers reported logistical or supply chain costs were less than 2 percent of landed duty paid value, and included port fees, loading expenses, container washing, and service fees. Responding importers reported compliance or brokerage costs that were less than 6 percent, warehousing costs of less than 1 percent,[22] and reported no currency conversion costs.

Importer *** reported that it compares its direct import costs with U.S. producers to determine the additional transaction costs, and importer *** reported that it compares costs to both U.S. producers and other importers, and importers *** reported comparing costs to neither U.S. producers nor other importers. Three importers reported transportation costs of about 1 percent of landed duty paid value.

Table V-8
Silicon metal: Weighted-average U.S. prices/import cost and quantities of domestic and imported product 3, by quarters, January 2014-December 2016

* * * * * * *

Figure V-4
Silicon metal: Weighted-average U.S. prices/import purchase cost and quantities of domestic and imported product 3,[1] by quarters, January 2014-December 2016

* * * * * * *

In general, landed duty paid values decreased during 2014-2016. Table V-9 summarizes purchase cost trends, by country for pricing product 3. As shown in the table, import purchase costs for silicon metal from Brazil *** and for silicon metal from Norway, purchase costs *** percent. U.S.-produced pricing product 3 declined by *** percent over the same period.

(…*continued*)

[19] These importers include ***. These reported direct imports account for *** percent of total imports of silicon metal during 2014-16. Importers *** reported also purchasing from domestic sources, but only *** provided a response to the lost sales and lost revenue survey.

[20] Silicon metal less than 99.99% pure that contains a minimum of 98.0% silicon, a maximum of 1.50% iron, a maximum of 0.2% calcium, and a maximum of 0.4% aluminum.

[21] No importers reported import purchase cost data for pricing product 1 or pricing product 2.

[22] U.S. importer *** reported that ***.

Table V-9

Silicon metal: Number of quarters containing observations, low LDPV, high LDPV and change in LDPV over period by product and source, January 2014 -December 2016

Item	Number of quarters	Low LDPV (dollars per short ton)	High LDPV (dollars per short ton)	Change in LDPV over period[1] (percent)
Australia	***	***	***	---
Brazil	***	***	***	***
Kazakhstan	***	***	***	---
Norway	***	***	***	***

[1] First quarter to last quarter, if available.

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

The benefits of directly importing that were identified by importers include quality, predictability, and security of supply. Importer *** stated that it does not import instead of purchasing domestic product, but rather directly imports as a strategy to diversify and secure the supply of silicon metal. *** highlighted that until Mississippi entered the market, the only domestic source for silicon metal was Globe which has not always been a reliable supplier of silicon metal. Additionally, *** reported that ***. Importer *** stated that ***.

Importers *** stated that imported silicon metal is not always lower priced than domestic product, and *** stated that during 2014-16, its average import purchase cost *** has been higher than domestically produced silicon metal. Importer *** reported that on average it has saved about 2 percent by directly importing silicon metal, and that this margin has remained stable since 2014.

LOST SALES AND LOST REVENUE

Of the three responding U.S. producers, *** reported that they had to reduce prices and *** reported that it had to roll back announced price increases. *** submitted lost sales and lost revenue allegations. The *** identified eight firms where they lost sales or revenue (seven consisting of lost sales allegations and one consisting of lost revenue allegations). All allegations of lost sales and lost revenue occurred in 2016 and 2017. Five allegations included Australia, three allegations included Brazil, two allegations included Kazakhstan, and four allegations included Norway. Most lost sales and lost revenue allegations were through contract negotiations and two were through a request for quote.

Staff contacted all eight purchasers and received responses from six purchasers identified by *** in the lost sales and lost revenue allegations, and three additional purchasers that submitted survey responses without being first contacted by Commission staff. Responding purchasers reported purchasing over 5 million short tons of silicon metal during 2014-2016 (table V-10).

Table V-10
Silicon metal: Purchasers' responses to purchasing patterns

* * * * * * *

During 2016, purchasers reported that *** percent of their purchases were from U.S. producers, *** percent from subject countries,[23] *** percent from nonsubject countries, and *** percent from "unknown source" countries. Of the responding purchasers, five reported increasing purchases from domestic producers, three reported decreasing purchases, and one reported fluctuating purchases.[24] Explanations for increasing purchases of domestic product included increased demand, competitively priced domestic product, and increased supply due to market entry of U.S. producer Mississippi. Explanations for decreasing purchases of domestic product included uncompetitive pricing of domestic sources and economic conditions.

Of the nine responding purchasers, eight reported that, since 2014, they had purchased imported silicon metal from subject countries instead of U.S.-produced product.[25] Four of these purchasers reported that subject import prices were lower than U.S.-produced product, and three of these purchasers reported that price was a primary reason for the decision to purchase imported product rather than U.S.-produced product. Purchaser *** reported that Globe was unable to compete on the full quantity of silicon metal needs, and that it awarded its business to the *** producers that offered prices that were in line with CRU's published market price plus freight and sizing. The reported estimated share of purchases these firms purchased from subject imports sources rather than domestic sources was less than 1 percent of total purchases, and purchaser-specific responses are presented in table V-11. Purchasers *** reported that they shifted from U.S. purchases to subject imports because domestic producers were unable to satisfy supply.

Table V-11
Silicon metal: Purchasers' responses to shifting supply sources

* * * * * * *

Eight of nine responding purchasers either reported that they either did not know if U.S. producers reduced their prices and one (***) reported that U.S. producers did not reduce their prices.

Responding U.S. purchasers identified various methods they use in purchasing silicon, including annual contracts and purchases on the spot market. In responding to the lost sales

[23] Purchasers reported *** percent of their 2016 purchases were sourced from Australia, *** percent from Brazil, *** percent from Kazakhstan, and *** percent from Norway.

[24] Of the nine responding purchasers, *** indicated that they did not know the source of the some of the silicon metal they purchased.

[25] Six of nine purchasers reported purchasing Australian silicon metal instead of domestically produced silicon metal, five purchased Brazilian silicon metal, and two purchasers each reported purchasing silicon metal from Kazakhstan and Norway.

lost revenue survey, some purchasers provided additional information on purchases and market dynamics, summarized below.

Purchaser *** stated that "***."

Purchaser *** stated "***."

Purchaser *** stated "***."

Purchaser *** stated "***. ***."

PART VI: FINANCIAL EXPERIENCE OF U.S. PRODUCERS

BACKGROUND

Three U.S. producers (Globe, DC Alabama, and Mississippi) reported their financial results on silicon metal.[1] These data are believed to account for *** U.S. production of silicon metal from January 2014 to December 2016. *** represented the majority of overall silicon metal sales in all years, followed by *** and ***. *** reported internal consumption or tolling operations; however, *** reported transfers to related firms during the period examined. ***.

OPERATIONS ON SILICON METAL

Table VI-1 presents aggregated data on U.S. producers' operations on silicon metal during the period examined, while table VI-2 presents selected company-specific financial data.

Net sales

***.[2] [3]

As shown in table VI-1, total net sales quantity ***. As shown in table VI-2, ***. ***. *** represented the majority of overall silicon metal net sales quantity in 2014 (*** percent), in 2015 (***) and in 2016 (***), followed by *** in 2014 (*** percent), in 2015 (*** percent) and in 2016 (*** percent).

As shown in Table VI-1, the per-unit net sales value increased from 2014 ($***) to 2015 ($***); however it dropped to $*** in 2016. As shown in table VI-2, company-specific per-unit data *** during the period examined.

[1] U.S. producers were requested to report their financial results on a calendar-year basis. All three firms reported their financial results on the basis of Generally Accepted Accounting Principles.

[2] ***. ***.

[3] ***. ***.

Table VI-1
Silicon Metal: Results of operations of U.S. producers, 2014-16

* * * * * * *

Table VI-2
Silicon metal: Results of operations of U.S. producers, by firm, 2014-16

* * * * * * *

Cost of goods sold and gross profit or (loss)

As shown in table VI-1 raw material costs represented the largest component of COGS, accounting for *** percent in 2014, *** percent in 2015, and *** percent in 2016. Table VI-2 shows that company-specific per-unit raw material costs for *** were decreasing through the period of investigation; while *** increased from 2014 to 2015 and then decreased in 2016; and *** reported an increase from 2015 to 2016.

Other factory costs were the second largest component of COGS, accounting for *** percent in 2014, *** percent in 2015, and *** percent in 2016, while direct labor accounted for *** percent in 2014 and 2015, and *** percent in 2016.

The industry's gross profits decreased from $*** in 2014 to $*** in 2015, before decreasing to *** in 2016.[4]

***.[5]

***.

***.[6] [7] [8]

Selling general and administrative expenses and operating profit or (loss)

As shown in table VI-1, the industry's selling, general, and administrative ("SG&A") expenses ratio (i.e., total SG&A expenses divided by total revenue) increased from *** percent in 2014 to *** percent in 2015 and then decreased to *** percent in 2016. Table VI-2 shows company-specific SG&A expenses. ***.

***.

***.[9]

---

[4] All three firms' financial data ***. ***.

[5] ***.

[6] ***. U.S. producers' questionnaire, questions III-7 and III-8; ***.

[7] The Commission's current practice requires that relevant cost information associated with input purchases from related suppliers correspond to the manner in which this information is reported in the U.S. producer's own accounting books and records.

[8] ***. Dow Corning's postconference brief, p. 19.

[9] ***.

All other expenses and net income or (loss)

All other income and expenses increased from 2014 to 2016, largely reflecting the data reported by ***.

Net income followed the same trend as operating income, declining from $*** in 2014 to $*** in 2015, then to *** in 2016. While all three firms reported *** from 2015 to 2016 on silicon metal operations, *** was the only firm that *** during the entire period of investigation.

Variance analysis

A variance analysis for the operations of U.S. producers of silicon metal is presented in table VI-3.[10] The information for this variance analysis is derived from table VI-1. The analysis indicates that from 2014 to 2016, the decrease in operating income is attributed to both unfavorable price and net cost/expense variances (that prices declined and cost/expenses increased).

Table VI-3
Silicon metal: Variance analysis on the operations of U.S. producers, between calendar years

* * * * * * *

CAPITAL EXPENDITURES AND RESEARCH AND DEVELOPMENT EXPENSES

Table VI-4 presents capital expenditures and research and development expenses by firm. Capital expenditures increased by 115.1 percent from 2014 to 2015, and then decreased by 82.4 percent from 2015 to 2016. ***. ***.[11] ***.[12] ***.[13] No firms reported research and development expenses during the period examined.

[10] The Commission's variance analysis is calculated in three parts: Sales variance, cost of sales variance (COGS variance), and 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 COGS 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 COGS and SG&A variances, respectively, and the volume variance is the sum of the volume components of the net sales, COGS, and SG&A expense variances. The overall volume component of the variance analysis is generally small.

[11] U.S. producer *** questionnaire, question III-13; ***.

[12] U.S. producer *** questionnaire, question III-13.

[13] U.S. producer *** questionnaire, question III-13.

Table VI-4
Silicon metal: Capital expenditures and research and development expenses of U.S. producers, 2014-16

* * * * * * *

ASSETS AND RETURN ON ASSETS

Table VI-5 presents data on the U.S. producers' total assets and their return on assets ("ROA"). Total assets steadily increased from $*** in 2014 to $*** in 2016, and the ROA steadily declined during this time.[14] [15]

Table VI-5
Silicon metal: U.S. producers' total assets and ROA, 2014-16

* * * * * * *

CAPITAL AND INVESTMENT

The Commission requested U.S. producers of silicon metal to describe any actual or potential negative effects of imports of silicon metal from Australia, Brazil, Kazakhstan, and Norway on their firms' growth, investment, ability to raise capital, development and production efforts, or the scale of capital investments. Table VI-6 presents U.S. producers' responses in a tabulated format and table VI-7 provides the narrative responses.

***.[16]

[14] 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 generally are not product specific. Thus, high-level allocation factors and estimates may have been required in order to report a total asset value for silicon metal.

[15] ***.

[16] Petitioner's postconference brief, pp. 7, 26.

Table VI-6
Silicon metal: Actual and anticipated negative effects of imports on investment, growth, and development, since January 1, 2014

Item	No	Yes
Negative effects on investment	2	1
Cancellation, postponement, or rejection of expansion projects		1
Denial or rejection of investment proposal		0
Reduction in the size of capital investments		1
Return on specific investments negatively impacted		0
Other		1
Negative effects on investment differ by country	2	1
Negative effects on growth and development	2	1
Rejection of bank loans		1
Lowering of credit rating		0
Problem related to the issue of stocks or bonds		1
Ability to service debt		1
Other		0
Negative effects on growth and development differ by country	2	1
Anticipated negative effects of imports	2	1
Anticipated negative effects of imports differ by country	2	1

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

***.[17]
***.[18] ***.[19]

Table VI-7
Silicon metal: Narratives relating to the actual and anticipated negative effects of imports on investment, growth, and development, since January 1, 2014

* * * * * * *

[17] U.S. producer *** questionnaire, question III-13.
[18] U.S. producer *** questionnaire, question III-15b.
[19] U.S. producer *** questionnaire, question III-18.

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 nature of the alleged subsidies was presented earlier in this report; 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. 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."

THE INDUSTRY IN AUSTRALIA

Overview

The Commission issued foreign producers' or exporters' questionnaires to one firm, Simcoa (Australia), believed to produce and/or export silicon metal from Australia.[3] A usable response to the Commission's questionnaire was received from this firm. Simcoa (Australia)'s exports to the United States accounted for *** U.S. imports of silicon metal from Australia in 2016. According to estimates requested of the responding Australia producer, the production of silicon metal in Australia reported in this Part of the report accounted for *** production of silicon metal in Australia in 2016. Table VII-1 presents information on the silicon metal operations of the responding producers and exporters in Australia.

Table VII-1
Silicon metal: Summary data for firm in Australia, 2016

* * * * * * *

Changes in operations

Table VII-2 presents reported changes in operations by Simcoa (Australia) since January 1, 2014.

Table VII-2
Silicon metal: Reported changes in operations of firm in Australia, since January 1, 2014

* * * * * * *

Operations on silicon metal

Table VII-3 presents information on the silicon metal operations of the responding producer and exporter in Australia for 2014-16, as well as projections for 2017-18. Projections indicate that capacity and production will increase overall, while inventories will remain constant and shipments will fluctuate during 2017-18.

Capacity in Australia increased by *** percent from 2014 to 2015, but decreased by *** percent from 2015 to 2016. Capacity in Australia increased overall by *** percent from 2014 to 2016. Production also increased by *** percent from 2014 to 2015, but decreased by *** percent from 2015 to 2016. Production increased overall by *** percent from 2014 to 2016. Capacity utilization decreased by *** percentage points from 2014 to 2015, but increased by *** percentage points from 2015 to 2016. Capacity utilization decreased overall by ***

[3] This firm was identified through a review of information submitted in the petition and contained in proprietary Customs records.

percentage point from 2014 to 2016. In addition, end-of-period inventories increased by *** percent from 2014 to 2015, but decreased by *** percent from 2015 to 2016. End-of-period inventories decreased overall by *** percent from 2014 to 2016.

Table VII-3
Silicon metal: Data on industry in Australia, 2014-16, and projection calendar years, 2017-18

* * * * * * *

Total shipments of the responding Australian producer increased by *** percent from 2014 to 2016. Home market shipments declined from *** percent of total shipments in 2014 to *** percent of total shipments in 2015, but increased to *** percent of total shipments in 2016.

Exports of silicon metal to the United States increased by *** percent from 2014 to 2015, but decreased by *** percent from 2015 to 2016. Exports of silicon metal to the United States decreased overall by *** percent from 2014 to 2016. As a share of total shipments, exports to the United States increased from *** percent of total shipments in 2014 to *** percent of total shipments in 2015, but decreased to *** percent of total shipments in 2016. Exports of silicon metal to countries other than the United States accounted for *** of total shipments, increasing by *** percent from 2014 to 2016. Other export markets identified include ***. In addition, Simcoa (Australia) reported that it ***.

Exports

According to GTA, the top export market for silicon metal from Australia was the United States in 2016 (table VII-4). Germany was the second-largest export destination of silicon metal from Australia. During 2016, the United States and Germany accounted for 35.2 and 19.6 percent of total exports from Australia of silicon metal, respectively.

Table VII-4
Silicon metal: Australia exports by destination market, 2014-16

Destination market	Calendar year		
	2014	2015	2016
	Quantity (short tons)		
Australia exports to the United States	20,320	22,284	18,616
Australia exports to other major destination markets.--			
Germany	13,733	13,942	10,375
United Arab Emirates	6,360	2,381	5,842
Japan	232	3,231	5,595
Thailand	0	0	4,409
Qatar	0	0	2,816
Netherlands	2,804	3,679	1,181
Poland	1,508	4,021	1,121
United Kingdom	1,282	1,089	925
All other destination markets	10,145	2,228	1,967
Total Australia exports	56,384	52,856	52,848
	Value (1,000 dollars)		
Australia exports to the United States	51,120	55,930	32,277
Australia exports to other major destination markets.--			
Germany	32,371	29,946	20,644
United Arab Emirates	14,922	6,167	9,151
Japan	543	7,110	10,140
Thailand	0	0	7,509
Qatar	0	0	4,507
Netherlands	6,099	7,742	2,127
Poland	3,462	8,138	1,802
United Kingdom	2,486	1,922	1,067
All other destination markets	12,646	5,358	3,547
Total Australia exports	123,649	122,313	92,771

Table continued on next page.

Table VII-4 -- Continued
Silicon metal: Australia exports by destination market, 2014-16

Destination market	Calendar year		
	2014	2015	2016
	Unit value (dollars per short ton)		
Australia exports to the United States	2,516	2,510	1,734
Australia exports to other major destination markets.--			
Germany	2,357	2,148	1,990
United Arab Emirates	2,346	2,590	1,566
Japan	2,337	2,201	1,812
Thailand	---	---	1,703
Qatar	---	---	1,600
Netherlands	2,175	2,104	1,802
Poland	2,296	2,024	1,607
United Kingdom	1,940	1,764	1,153
All other destination markets	1,247	2,404	1,804
Total Australia exports	2,193	2,314	1,755
	Share of quantity (percent)		
Australia exports to the United States	36.0	42.2	35.2
Australia exports to other major destination markets.--			
Germany	24.4	26.4	19.6
United Arab Emirates	11.3	4.5	11.1
Japan	0.4	6.1	10.6
Thailand	---	---	8.3
Qatar	---	---	5.3
Netherlands	5.0	7.0	2.2
Poland	2.7	7.6	2.1
United Kingdom	2.3	2.1	1.8
All other destination markets	18.0	4.2	3.7
Total Australia exports	100.0	100.0	100.0

Source: Official Australia export statistics under HTS subheading 2804.69 as reported by Australian Bureau of Statistics in the IHS/GTA database, accessed March 16, 2017.

THE INDUSTRY IN BRAZIL

Overview

The Commission issued foreign producers' or exporters' questionnaires to five firms believed to produce and/or export silicon metal from Brazil.[4] Usable responses to the Commission's questionnaire were received from four firms: Companhia Ferroligas Minas Gerais ("Minasligas"), Dow Corning (Brazil), Ligas de Alumínio S/A ("LIASA"), and Rima Industrial S.A.

[4] These firms were identified through a review of information submitted in the petition and contained in proprietary Customs records. The one firm that did not respond to the Commission's questionnaire was ***, which accounted for approximately *** percent of production of silicon metal in Brazil in 2016.

("RIMA"). These firms' exports to the United States accounted for *** U.S. imports of silicon metal from Brazil over the period being examined. According to estimates requested of the responding Brazil producers, the production of silicon metal in Brazil reported in this Part of the report accounts for approximately 95 percent of overall production of silicon metal in Brazil. Table VII-5 presents information on the silicon metal operations of the responding producers and exporters in Brazil.

Table VII-5
Silicon metal: Summary data for firm in Brazil, 2016

* * * * * * *

Changes in operations

As presented in table VII-6, producers in Brazil reported several operational and organizational changes since January 1, 2014.

Table VII-6
Silicon metal: Reported changes in operations by producer in Brazil, since January 1, 2014

* * * * * * *

Operations on silicon metal

Table VII-7 presents information on the silicon metal operations of the responding producers and exporters in Brazil for 2014-16, as well as projections for 2017-18. Projections indicate that capacity, production, and shipments will fluctuate, while inventories will decrease during 2017-18.

Capacity in Brazil decreased by *** percent from 2014 to 2015, but increased by *** percent from 2015 to 2016. Capacity in Brazil decreased overall by *** percent from 2014 to 2016.[5] Production decreased by *** percent from 2014 to 2015, but increased by *** percent from 2015 to 2016. Production increased overall by *** percent from 2014 to 2016.[6] Capacity utilization decreased by *** percentage points from 2014 to 2015, but increased by *** percentage points from 2015 to 2016. Capacity utilization increased overall by *** percentage points from 2014 to 2016. In addition, end-of-period inventories increased by *** percent from 2014 to 2016.

[5] Dow Corning noted that "significant issues in the energy sector due to weather conditions in Brazil led many production facilities to cut back on their production, or even stop production of silicon metal altogether, during the period of investigation." Dow Corning's postconference brief, p. 28.

[6] LIASA noted that all producers in Brazil use charcoal as a resin in their production process rather than coal and the silicon metal they produce has very low levels of impurities. In addition, Brazilian "production technology offers a very high efficiency for the chemical industry with high reactivity and selectivity" on the silicon metal production process. Conference transcript, p. 89 (Augusto).

Total shipments of the responding Brazilian producers decreased by *** percent from 2014 to 2015, but increased by *** percent from 2015 to 2016. Total shipments of the responding Brazilian producers increased overall by *** percent from 2014 to 2016. Home market shipments declined from *** percent of total shipments in 2014 to *** percent of total shipments in 2015, and further declined to *** percent of total shipments in 2016.

Table VII-7
Silicon metal: Data on industry in Brazil, 2014-16, and projection calendar years, 2017-18

* * * * * * *

Brazilian exports of silicon metal to the United States decreased by *** percent from 2014 to 2015, but increased by *** percent from 2015 to 2016.[7] Exports of silicon metal to the United States increased overall by *** percent from 2014 to 2016.[8] As a share of the responding Brazilian producers' total shipments, exports to the United States decreased from *** percent of total shipments in 2014 to *** percent of total shipments in 2015, and further decreased to *** percent of total shipments in 2016. Exports of silicon metal to countries other than the United States accounted for *** of total shipments during 2015 and 2016.[9] Exports of silicon metal to countries other than the United States increased by *** percent from 2014 to 2016. Other export markets identified include ***. In addition, *** in Brazil reported ***.

Exports

According to GTA, the top export market for silicon metal from Brazil was the United States in 2016 (table VII-8). Germany was the second-largest export destination of silicon metal from Brazil. During 2016, the United States and Germany accounted for 38.4 and 16.2 percent of total exports from Brazil of silicon metal, respectively.

[7] Minasligas explained that it ***. ***.

[8] Dow Corning (Brazil) noted in its questionnaire response that ***.

[9] Dow Corning noted that ***, demonstrating that there are significant markets other than the United States that are open to Brazilian producers and exporters. Dow Corning's postconference brief, p. 26.

Table VII-8
Silicon metal: Brazil exports by destination market, 2014-16

Destination	Calendar year		
	2014	2015	2016
	Quantity (in short tons contained silicon)		
Brazil exports to the United States	79,228	46,198	78,275
Brazil exports to other major destination markets.--			
Germany	21,390	9,740	33,060
United Kingdom	25,353	46,071	31,764
Netherlands	1,708	441	17,633
Poland	187	386	8,822
Japan	2,094	1,543	5,093
Thailand	2,646	882	4,685
Canada	882	1,213	4,317
Italy	4,324	0	3,663
All other destination markets	5,943	2,534	16,318
Total Brazil exports	143,755	109,007	203,630
	Value (1,000 dollars)		
Brazil exports to the United States	189,129	113,143	172,694
Brazil exports to other major destination markets.--			
Germany	49,787	22,036	57,154
United Kingdom	63,685	113,003	62,728
Netherlands	3,837	862	25,514
Poland	383	647	12,989
Japan	4,234	3,403	9,717
Thailand	5,063	1,988	9,148
Canada	2,083	3,097	6,043
Italy	9,448	0	5,302
All other destination markets	13,145	4,969	23,986
Total Brazil exports	340,793	263,149	385,275

Table continued on next page.

Table VII-8 -- Continued
Silicon metal: Brazil exports by destination market, 2014-16

Destination	Calendar year		
	2014	2015	2016
	Unit value (dollars per short ton contained silicon)		
Brazil exports to the United States	2,387	2,449	2,206
Brazil exports to other major destination markets.--			
Germany	2,328	2,262	1,729
United Kingdom	2,512	2,453	1,975
Netherlands	2,246	1,954	1,447
Poland	2,045	1,676	1,472
Japan	2,022	2,205	1,908
Thailand	1,914	2,255	1,953
Canada	2,362	2,554	1,400
Italy	2,185	---	1,447
All other destination markets	2,212	1,961	1,470
Total Brazil exports	2,371	2,414	1,892
	Share of quantity (percent)		
Brazil exports to the United States	55.1	42.4	38.4
Brazil exports to other major destination markets.--			
Germany	14.9	8.9	16.2
United Kingdom	17.6	42.3	15.6
Netherlands	1.2	0.4	8.7
Poland	0.1	0.4	4.3
Japan	1.5	1.4	2.5
Thailand	1.8	0.8	2.3
Canada	0.6	1.1	2.1
Italy	3.0	---	1.8
All other destination markets	4.1	2.3	8.0
Total Brazil exports	100.0	100.0	100.0

Source: Official Brazil export statistics under HTS subheading 2804.69 as reported by Brazil's Foreign Trade Secretariat (SECEX) in the IHS/GTA database, accessed March 16, 2017.

THE INDUSTRY IN KAZAKHSTAN

Overview

The Commission issued foreign producers' or exporters' questionnaires to two firms believed to produce and/or export silicon metal from Kazakhstan.[10] Usable responses to the Commission's questionnaire were received from two firms: Kaz Silicon, LLP ("Kaz Silicon")[11] and TKS Temir. These firms' exports to the United States accounted for approximately *** percent of U.S. imports of silicon metal from Kazakhstan in 2016. According to estimates requested of the responding producers in Kazakhstan, the production of silicon metal reported in this Part of the report accounts for *** production of silicon metal in Kazakhstan in 2016. Table VII-9 presents information on the silicon metal operations of the responding producers and exporters in Kazakhstan.

Table VII-9
Silicon metal: Summary data for firms in Kazakhstan, 2016

* * * * * * *

Changes in operations

As presented in table VII-10 producers in Kazakhstan reported several operational and organizational changes since January 1, 2014.

Table VII-10
Silicon metal: Reported changes in operations by producers in Kazakhstan, since January 1, 2014

* * * * * * *

Operations on silicon metal

Table VII-11 presents information on the silicon metal operations of the responding producers and exporters in Kazakhstan for 2014-16, as well as projections for 2017-18. Projections indicate that capacity, production, and shipments will fluctuate, while inventories will decrease during 2017-18.

Table VII-11
Silicon metal: Data on industry in Kazakhstan, 2014-16, and projection calendar years, 2017-18

* * * * * * *

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

[11] Kaz Silicon ***. ***.

Capacity in Kazakhstan increased by *** percent from 2014 to 2016. Production increased by *** percent from 2014 to 2016. Capacity utilization increased by *** percentage points from 2014 to 2016.[12] In addition, end-of-period inventories decreased by *** percent from 2014 to 2016.

Total shipments of the responding producers in Kazakhstan increased by *** percent from 2014 to 2016. Home market shipments declined from *** percent of total shipments in 2014 to *** percent of total shipments in 2015, but increased to *** percent of total shipments in 2016.

Exports of silicon metal to the United States increased by *** percent from 2014 to 2016. As a share of total shipments of the responding producers in Kazakhstan, exports to the United States increased from *** percent of total shipments in 2014 to *** percent of total shipments in 2015, and further increased to *** percent of total shipments in 2016. Exports of silicon metal to countries other than the United States increased by *** percent from 2014 to 2016. Other export markets identified include ***.

Alternative products

*** produced both subject silicon metal and out-of-scope products on the same equipment as shown in table VII-12. Overall capacity increased by *** percent from 2014 to 2016. Production of subject silicon metal accounted for *** percent and *** percent of total production in 2014 and 2015, respectively. ***. Out-of-scope production accounted for *** percent and *** percent of total production in 2014 and 2015, respectively. Other products produced on the same equipment as silicon metal include ***.

Table VII-12
Silicon metal: Overall capacity and production on the same equipment as in-scope production by producers in Kazakhstan, 2014-16

* * * * * * *

Exports

According to GTA, the top export market for silicon metal from Kazakhstan was the United States in 2016 (table VII-13). Germany was the second-largest export destination of silicon metal from Kazakhstan. During 2016, the United States and Germany accounted for 48.0 and 25.0 percent of total exports from Kazakhstan of silicon metal, respectively.

[12] This increase in capacity, production, and capacity utilization in 2015 and 2016 is due to ***. ***.

Table VII-13
Silicon metal: Kazakhstan exports by destination market, 2014-16

Destination	Calendar year		
	2014	2015	2016
	Quantity (in short tons contained silicon)		
Kazakhstan exports to the United States	485	5,472	9,637
Kazakhstan exports to other major destination markets.--			
Germany	0	397	5,013
United Kingdom	772	5,045	2,840
Netherlands	0	0	1,134
Poland	0	66	551
Japan	0	732	331
Thailand	0	0	306
Canada	0	0	220
Italy	0	0	22
All other destination markets	551	1,080	18
Total Kazakhstan exports	1,808	12,792	20,073
	Value (1,000 dollars)		
Kazakhstan exports to the United States	1,194	12,536	16,968
Kazakhstan exports to other major destination markets.--			
Germany	0	779	7,022
United Kingdom	1,773	9,821	3,578
Netherlands	0	0	1,656
Poland	0	110	727
Japan	0	1,628	571
Thailand	0	0	506
Canada	0	0	384
Italy	0	0	32
All other destination markets	1,172	2,022	10
Total Kazakhstan exports	4,139	26,895	31,453

Table continued on next page.

Table VII-13 -- Continued
Silicon metal: Kazakhstan exports by destination market, 2014-16

Destination	Calendar year		
	2014	2015	2016
	Unit value (dollars per short ton contained silicon)		
Kazakhstan exports to the United States	2,461	2,291	1,761
Kazakhstan exports to other major destination markets.--			
Germany	---	1,962	1,401
United Kingdom	2,298	1,947	1,260
Netherlands	---	---	1,460
Poland	---	1,658	1,319
Japan	---	2,224	1,726
Thailand	---	---	1,653
Canada	---	---	1,740
Italy	---	---	1,450
All other destination markets	2,127	1,872	532
Total Kazakhstan exports	2,289	2,102	1,567
	Share of quantity (percent)		
Kazakhstan exports to the United States	26.8	42.8	48.0
Kazakhstan exports to other major destination markets.--			
Germany	---	3.1	25.0
United Kingdom	42.7	39.4	14.1
Netherlands	---	---	5.7
Poland	---	0.5	2.7
Japan	---	5.7	1.6
Thailand	---	---	1.5
Canada	---	---	1.1
Italy	---	---	0.1
All other destination markets	30.5	8.4	0.1
Total Kazakhstan exports	100.0	100.0	100.0

Source: Official Kazakhstan export statistics under HTS subheading 2804.69 as reported by Kazakhstan's Customs Control Committee of the Ministry of Finance in the IHS/GTA database, accessed March 16, 2017.

THE INDUSTRY IN NORWAY

Overview

The Commission issued foreign producers' or exporters' questionnaires to two firms believed to produce and/or export silicon metal from Norway.[13] Usable responses to the Commission's questionnaire were received from two firms: Elkem and Wacker Chemical

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

Norway AS ("Wacker"). These firms' exports to the United States accounted for approximately *** percent of U.S. imports of silicon metal from Norway over the period being examined. According to estimates requested of the responding Norway producers, the production of silicon metal in Norway reported in this Part of the report accounts for *** of production of silicon metal in Norway. Table VII-14 presents information on the silicon metal operations of the responding producers and exporters in Norway.

Table VII-14
Silicon metal: Summary data on firms in Norway, 2016

* * * * * * *

Changes in operations

As presented in table VII-15 producers in Norway reported several operational and organizational changes since January 1, 2014.

Table VII-15
Silicon metal: Reported changes in operations by producers in Norway, since January 1, 2014

* * * * * * *

Operations on silicon metal

Table VII-16 presents information on the silicon metal operations of the responding producers and exporters in Norway for 2014-16, as well as projections for 2017-18. Projections indicate that capacity, production, and shipments will decrease, while inventories will remain the same during 2017-18.

Capacity in Norway decreased by *** percent from 2014 to 2015 and remained constant from 2015 to 2016.[14] Production decreased by *** percent from 2014 to 2015, but increased by *** percent from 2015 to 2016. Production increased overall by *** percent from 2014 to 2016. Capacity utilization remained constant from 2014 to 2015, but increased by *** percentage points from 2015 to 2016. In addition, end-of-period inventories decreased by *** percent from 2014 to 2015, but increased by *** percent from 2015 to 2016. End-of-period inventories decreased overall by *** percent from 2014 to 2016.

[14] On March 8, 2017, Wacker announced that it is investing €85 million to expand the capacity of its silicon metal plant in Holla, Norway. The plant is expected to be completed during the first half of 2019. *WACKER Expands Silicon-Metal Capacity at Norwegian Production Site in Holla*, https://www.wacker.com/cms/en/press_media/press-releases/pressinformation-detail_78912.jsp?from_all_summary=true, March 8, 2017.

Table VII-16
Silicon metal: Data industry in Norway, 2014-16, and projection calendar years, 2017-18

* * * * * * *

Total shipments of the responding Norwegian producers increased by *** percent from 2014 to 2016. Home market shipments declined from *** percent of total shipments in 2014 to *** percent of total shipments in 2015, and further declined to *** percent of total shipments in 2016.

Exports of silicon metal to the United States decreased by *** percent from 2014 to 2016. As a share of the responding Norwegian producers' total shipments, exports to the United States decreased from *** percent of total shipments in 2014 to *** percent of total shipments in 2015, but increased to *** percent of total shipments in 2016. Exports of silicon metal to countries other than the United States accounted for *** of total shipments, increasing by *** percent from 2014 to 2016. Other export markets identified include ***.[15]

Alternative products

*** reported producing both subject silicon metal and out-of-scope products on the same equipment as shown in table VII-17. Overall capacity decreased by *** percent from 2014 to 2016. Production of subject silicon metal accounted for *** percent of total production on the same equipment as silicon metal and out-of-scope production accounted for *** percent in 2016. Other products produced on the same equipment as silicon metal include ***. ***, however, switch production between silicon metal and products such as ferrosilicon.[16]

Table VII-17
Silicon metal: Overall capacity and production on the same equipment as in-scope production in Norway, 2014-16

* * * * * * *

Exports

According to GTA, the top export market for silicon metal from Norway was Germany in 2016 (table VII-18). The Netherlands was the second-largest export destination of silicon metal from Norway. During 2016, Germany and the Netherlands accounted for 46.8 and 19.4 percent of total exports from Norway of silicon metal, respectively.

[15] Wacker noted that it does not export silicon metal to the United States because it currently only produces silicon metal with specification suitable for the production of silicons, but not polysilicons. Therefore, it only exports to its parent company in Germany. Conference transcript, p. 98 (Majumdar).

[16] Conference transcript, p. 99 (Majumdar).

Table VII-18
Silicon metal: Norway's exports by destination market, 2014-16

Destination	Calendar year		
	2014	2015	2016
	Quantity (in short tons contained silicon)		
Norway exports to the United States	9,587	9,533	11,077
Norway exports to other major destination markets.--			
Germany	107,414	106,692	98,754
Netherlands	46,058	30,738	40,840
France	14,204	22,320	23,099
Korea South	12,900	12,126	11,729
United Kingdom	0	22	8,185
Sweden	6,654	7,037	7,142
Japan	4,634	6,650	6,725
Canada	683	0	1,402
All other destination markets	3,180	5,535	2,090
Total Norway exports	205,314	200,653	211,043
	Value (1,000 dollars)		
Norway exports to the United States	27,936	24,970	23,244
Norway exports to other major destination markets.--			
Germany	234,132	209,945	167,367
Netherlands	104,246	65,254	77,911
France	30,874	45,878	42,205
Korea South	33,262	32,354	23,544
United Kingdom	0	68	13,827
Sweden	15,417	15,014	11,534
Japan	15,428	17,681	18,952
Canada	1,769	0	1,987
All other destination markets	8,780	17,838	6,914
Total Norway exports	471,844	429,001	387,486

Table continued on next page.

Table VII-18 -- Continued
Silicon metal: Norway's exports by destination market, 2014-16

Destination	Calendar year		
	2014	2015	2016
	Unit value (dollars per short ton contained silicon)		
Norway exports to the United States	2,914	2,619	2,098
Norway exports to other major destination markets.--			
Germany	2,180	1,968	1,695
Netherlands	2,263	2,123	1,908
France	2,174	2,056	1,827
Korea South	2,579	2,668	2,007
United Kingdom	---	3,085	1,689
Sweden	2,317	2,133	1,615
Japan	3,329	2,659	2,818
Canada	2,588	---	1,417
All other destination markets	2,761	3,223	3,309
Total Norway exports	2,298	2,138	1,836
	Share of quantity (percent)		
Norway exports to the United States	4.7	4.8	5.2
Norway exports to other major destination markets.--			
Germany	52.3	53.2	46.8
Netherlands	22.4	15.3	19.4
France	6.9	11.1	10.9
Korea South	6.3	6.0	5.6
United Kingdom	---	0.0	3.9
Sweden	3.2	3.5	3.4
Japan	2.3	3.3	3.2
Canada	0.3	---	0.7
All other destination markets	1.5	2.8	1.0
Total Norway exports	100.0	100.0	100.0

Source: Official Norway export statistics under HTS subheading 2804.69 as reported by Statistics Norway in the IHS/GTA database, accessed March 16, 2017.

THE INDUSTRIES IN SUBJECT COUNTRIES

Operations on silicon metal

Table VII-19 presents information on the silicon metal operations of the producers and exporters in all four subject countries combined during 2014-16 as well as projections for calendar years 2017-18.

Table VII-19
Silicon metal: Data on industry in subject countries, 2014-16, projection calendar years 2017-18

Item	Actual experience			Projections	
	Calendar year				
	2014	2015	2016	2017	2018
	Quantity (short tons contained silicon)				
Capacity	532,511	514,479	538,499	535,762	547,290
Production	421,665	402,384	511,517	508,483	518,850
End-of-period inventories	49,100	52,756	50,109	47,462	46,434
Shipments:					
Home market shipments:					
Internal consumption/transfers	7,492	8,331	5,655	4,063	4,163
Commercial shipments	29,839	19,398	30,201	33,246	35,100
Subtotal, home market shipments	37,331	27,729	35,856	37,309	39,263
Export shipments to:					
United States	110,036	84,924	117,966	118,642	101,692
All other markets	269,730	286,075	360,342	355,171	378,922
Total exports	379,766	370,999	478,308	473,813	480,614
Total shipments	417,097	398,728	514,164	511,122	519,877
	Ratios and shares (percent)				
Capacity utilization	79.2	78.2	95.0	94.9	94.8
Inventories/production	11.6	13.1	9.8	9.3	8.9
Inventories/total shipments	11.8	13.2	9.7	9.3	8.9
Share of shipments:					
Home market shipments:					
Internal consumption/transfers	1.8	2.1	1.1	0.8	0.8
Home market shipments	7.2	4.9	5.9	6.5	6.8
Subtotal, home market shipments	9.0	7.0	7.0	7.3	7.6
Export shipments to:					
United States	26.4	21.3	22.9	23.2	19.6
All other markets	64.7	71.7	70.1	69.5	72.9
Total exports	91.0	93.0	93.0	92.7	92.4
Total shipments	100.0	100.0	100.0	100.0	100.0

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

Alternative products

Table VII-20 presents information on the overall capacity and production on the same equipment as in-scope production by producers in subject countries during 2014-16.

Table VII-20
Silicon metal: Overall capacity and production on the same equipment as in-scope production by producers in subject countries, 2014-16

* * * * * * *

U.S. INVENTORIES OF IMPORTED MERCHANDISE

Table VII-21 presents data on U.S. importers' reported inventories of silicon metal.

Table VII-21
Silicon metal: U.S. importers' end-of-period inventories of imports by source, 2014-16

* * * * * * *

U.S. IMPORTERS' OUTSTANDING ORDERS

The Commission requested importers to indicate whether they imported or arranged for the importation of silicon metal from Australia, Brazil, Kazakhstan, and Norway after December 31, 2016 (table VII-22).

Table VII-22
Silicon metal: U.S. importers' arranged imports, January 2017 through December 2017

* * * * * * *

ANTIDUMPING OR COUNTERVAILING DUTY ORDERS IN THIRD-COUNTRY MARKETS

On February 20, 2017, the Canadian International Trade Tribunal gave notice that, pursuant to subsection 34(2) of the *Special Import Measures Act* (*SIMA*), it has initiated a preliminary injury inquiry to determine whether the evidence discloses a reasonable indication that the alleged injurious dumping of silicon metal containing at least 96.00% but less than 99.99% silicon by weight, and silicon metal containing between 89.00% and 96.00% silicon by weight that contains aluminum greater than 0.20% by weight, of all forms and sizes (the subject goods), originating in or exported from Brazil, Kazakhstan, Laos, Malaysia, Norway, Russia, and Thailand, and subsidizing of the subject goods originating in or exported from Brazil, Kazakhstan, Malaysia, Norway and Thailand, have caused injury or retardation or are threatening to cause injury, as these words are defined in *SIMA*.[17]

[17] Petition, Vol. I, exh. I-51; *Tribunal Initiates Injury—Silicon Metal from Brazil, Kazakhstan, Laos, Malaysia, Norway, Russia, and Thailand*, https://www.canada.ca/en/international-trade-tribunal/news/2017/02/tribunal_initiatesinquirysiliconmetalfrombrazilkazakhstanlaosmal.html, February 21, 2017; *Certain Silicon Metal*, http://www.cbsa-asfc.gc.ca/sima-lmsi/i-e/sm22017/sm22017-in-eng.html, March 7, 2017.

INFORMATION ON NONSUBJECT COUNTRIES

World Production

World production of silicon metal was estimated by the USGS to have been more than 2.8 million short tons in 2014, excluding silicon metal produced in the United States. China was by far the leading producer of silicon metal in 2014 with an estimated 2.2 million short tons; accounting for 77 percent of the world's total silicon metal production. Other major producers of silicon metal in 2014 were, in descending order, Norway, France, and Brazil. These four countries accounted for 90 percent of total world silicon metal production. Table VII-23 shows production of silicon metal, by country.

Table VII-23
Silicon metal: World production, by country, 2010-14

Country[1]	Short tons, gross weight				
	Calendar year				
	2010	2011	2012	2013	2014
China	1,260,000	1,490,000	1,250,000	1,430,000	2,200,000
Norway	193,000	193,000	165,000	165,000	165,000
France	123,000	115,000	105,000	110,000	110,000
Brazil	146,000	146,000	147,000	151,000	102,000
Russia	53,700	63,800	57,900	55,100	55,100
Australia	33,100	33,100	33,100	33,100	52,900
South Africa	51,100	64,800	58,400	37,500	37,500
Germany	33,200	33,200	32,000	30,900	30,900
Bosnia and Herzegovina	19,200	17,300	15,500	15,500	17,200
Laos	8,600	3,300	16,900	13,200	10,500
Uzbekistan	0	0	1,870	6,610	7,720
Kazakhstan	1,700	8,800	11,000	2,800	2,800
Total	1,990,000	2,240,000	1,950,000	2,100,000	2,870,000

[1] Excludes the United States.

Note: Totals are rounded to no more than three significant digits and may not add to totals shown.

Source: Compiled from the USGS Survey, Minerals Yearbook 2014.

Table VII-24 presents the leading exporting countries of silicon metal from 2014 to 2016. Total world exports decreased by 23.1 percent by quantity and 35.8 percent by value from 2014 to 2016. China accounted for the largest share of global exports by quantity in 2016 (45.7 percent), followed by Norway (13.6 percent), Brazil (13.2 percent), Australia (3.4 percent), and South Africa (1.9 percent).

Table VII-24
Silicon metal: Global exports by country, 2014-16

Country	Calendar year		
	2014	2015	2016
	Quantity (in short tons contained silicon)		
United States	3,756	2,995	5,704
Subject exporters.--			
Australia	56,384	52,856	52,848
Brazil	143,755	109,007	203,630
Kazakhstan	1,808	12,792	20,073
Norway	205,314	200,653	211,043
Subject exporters	407,261	375,309	487,594
All other major reporting exporters.--			
China	960,394	854,819	707,456
South Africa	54,285	56,827	29,803
Bosnia & Herzegovina	18,757	19,730	24,153
Canada	25,493	25,009	21,869
Russia	28,341	29,847	21,677
Thailand	59,624	18,297	10,324
Japan	1,349	2,731	2,293
United Kingdom	2,558	1,783	2,224
All other exporters	152,012	210,433	234,363
Total global exports	1,713,829	1,597,780	1,547,460
	Value (1,000 dollars)		
United States	9,357	7,341	8,800
Subject exporters.--			
Australia	123,649	122,313	92,771
Brazil	340,793	263,149	385,275
Kazakhstan	4,139	26,895	31,453
Norway	471,844	429,001	387,486
Subject exporters	940,425	841,357	896,986
All other major reporting exporters.--			
China	1,978,644	1,777,455	1,223,053
South Africa	136,541	149,197	61,210
Bosnia & Herzegovina	44,770	45,315	41,958
Canada	59,985	62,704	52,272
Russia	54,391	57,180	34,470
Thailand	95,802	31,591	16,525
Japan	23,288	39,146	34,242
United Kingdom	6,725	4,014	3,947
All other exporters	384,289	467,884	430,626
Total global exports	3,734,216	3,483,185	2,804,086

Table continued on next page.

Table VII-24 -- Continued
Silicon metal: Global exports by country, 2014-16

Country	Calendar year		
	2014	2015	2016
	Unit value (dollars per short ton)		
United States	2,491	2,451	1,543
Subject exporters.-- Australia	2,193	2,314	1,755
Brazil	2,371	2,414	1,892
Kazakhstan	2,289	2,102	1,567
Norway	2,298	2,138	1,836
Subject exporters	2,309	2,242	1,840
All other major reporting exporters.-- China	2,060	2,079	1,729
South Africa	2,515	2,625	2,054
Bosnia & Herzegovina	2,387	2,297	1,737
Canada	2,353	2,507	2,390
Russia	1,919	1,916	1,590
Thailand	1,607	1,727	1,601
Japan	17,261	14,336	14,932
United Kingdom	2,629	2,251	1,775
All other exporters	2,528	2,223	1,837
Total global exports	2,179	2,180	1,812
	Share of quantity (percent)		
United States	0.2	0.2	0.4
Subject exporters.-- Australia	3.3	3.3	3.4
Brazil	8.4	6.8	13.2
Kazakhstan	0.1	0.8	1.3
Norway	12.0	12.6	13.6
Subject exporters	23.8	23.5	31.5
All other major reporting exporters.-- China	56.0	53.5	45.7
South Africa	3.2	3.6	1.9
Bosnia & Herzegovina	1.1	1.2	1.6
Canada	1.5	1.6	1.4
Russia	1.7	1.9	1.4
Thailand	3.5	1.1	0.7
Japan	0.1	0.2	0.1
United Kingdom	0.1	0.1	0.1
All other exporters	8.9	13.2	15.1
Total global exports	100.0	100.0	100.0

Note.--Not all authorities have reported full year 2016 data into the HIS/GTA database as of the date pulled.

Source: Official export statistics under HTS subheading 2804.69 as reported by various national statistical authorities in the IHS/GTA database, accessed April 13, 2017.

Table VII-25 presents data on South Africa's top export markets of silicon metal from 2014 to 2016. South Africa was the leading source of silicon metal imports to the United States

from 2014 to 2016. The United States was South Africa's largest export market in 2016, followed by the Korea, the Netherlands, Japan, and Germany. The average unit value of South African exports to each of these five countries (except for the Netherlands) declined from 2014 to 2016. During the same period, the United States' share of exports by quantity from South Africa decreased by 16.7 percentage points, from 79.8 percent in 2014 to 63.1 percent in 2016.

Table VII-25
Silicon metal: South Africa exports by destination market, 2014-16

Destination market	Calendar year		
	2014	2015	2016
	Quantity (short tons)		
South Africa exports to the United States	43,335	45,013	18,809
South Africa exports to other major destination markets.--			
Korea	8,113	9,083	6,197
Netherlands	0	0	1,984
Japan	551	776	731
Germany	556	0	710
India	121	0	473
United Kingdom	397	331	276
Qatar	0	0	240
Greece	0	0	132
All other destination markets	1,212	1,624	250
Total South Africa exports	54,285	56,827	29,803
	Value (1,000 dollars)		
South Africa exports to the United States	110,617	121,171	41,344
South Africa exports to other major destination markets.--			
Korea	21,207	24,393	12,189
Netherlands	0	0	2,097
Japan	1,500	2,501	2,146
Germany	1,286	0	1,269
India	17	0	728
United Kingdom	919	615	423
Qatar	0	0	380
Greece	0	0	212
All other destination markets	995	518	422
Total South Africa exports	136,541	149,197	61,210

Table continued on next page.

Table VII-25 -- Continued
Silicon metal: South Africa exports by destination market, 2014-16

Destination market	Calendar year		
	2014	2015	2016
	Unit value (dollars per short ton)		
South Africa exports to the United States	2,553	2,692	2,198
South Africa exports to other major destination markets.--			
Korea	2,614	2,685	1,967
Netherlands	--	--	1,057
Japan	2,721	3,223	2,934
Germany	2,315	--	1,787
India	137	--	1,540
United Kingdom	2,316	1,861	1,535
Qatar	--	--	1,581
Greece	--	--	1,599
All other destination markets	822	319	1,687
Total South Africa exports	2,515	2,625	2,054
	Share of quantity (percent)		
South Africa exports to the United States	79.8	79.2	63.1
South Africa exports to other major destination markets.--			
Korea	14.9	16.0	20.8
Netherlands	--	--	6.7
Japan	1.0	1.4	2.5
Germany	1.0	--	2.4
India	0.2	--	1.6
United Kingdom	0.7	0.6	0.9
Qatar	--	--	0.8
Greece	--	--	0.4
All other destination markets	2.2	2.9	0.8
Total South Africa exports	100.0	100.0	100.0

Source: Official South Africa export statistics under HTS subheading 2804.69 as reported by South African Revenue Service in the IHS/GTA database, accessed March 16, 2017.

Major nonsubject countries

In late 2015, the Spanish firm Grupo FerroAtlántica merged with Globe Specialty Metals (GSM) to become Ferroglobe PLC, the leading producer of silicon metal and silicon-based alloys in the world.[18] Collectively, Ferroglobe's silicon metal production capacity is about 543,000 short tons per year and is distributed as follows: Europe, 40 percent; North America, 40 percent; Africa, 14 percent; and Asia, 7 percent. The other leading global silicon metal

[18] *Globe Specialty Metals and Grupo FerroAtlántica Clear Regulatory Process and Complete Business Combination,* Ferroglobe PLC, December 23, 2015, http://www.ferroatlantica.es/press/news/globe-specialty-metals-and-grupo-ferroatl%C3%A1ntica-clear-regulatory-process-and-complete-business-combination/?lang=en, accessed March 24, 2017.

producers, in descending order of production capacity, were Dow Corning (228,000 short tons), Elkem (175,000 short tons), and Rima (114,000 short tons).[19]

China

China has the largest production capacity in the world and is believed to have over 200 producers of silicon metal with a total annual capacity of 1.65 million short tons.[20] Most of the producers are small, there being only seven producers having capacity in excess of 30,000 short tons per year.[21] China is the largest export source for silicon metal, accounting for about 54 percent of world exports in 2016, with most directed to markets in Asia. China also exports large quantities of silicon metal to Europe, the Middle East, Canada and Mexico. Antidumping duty orders on imports from China into the United States have been in place since 1991 and there have been minimal U.S. imports of silicon metal from China since then.[22]

Canada

There is one producer of silicon metal in Canada, Quebec Silicon Limited Partnership ("QSLP"), owned jointly by GSM and Dow Corning. GSM acquired its 51 percent share of QSLP in 2012. QSLP has the capacity to produce about 52,000 short tons of silicon metal per year.[23]

France

Ferroglobe operates five plants in France (Laudun, Anglefort, Les Clavaux, Montricher, and Chateau Feuillet,) with a combined silicon metal production capacity of about 164,000 short tons per year.[24]

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[19] Investor Presentation, January 2017, Ferroglobe PLC, p. 7, http://investor.ferroglobe.com/common/download/download.cfm?companyid=AMDA-5STP82&fileid=890793&filekey=CFE050BE-EFCF-45C5-B36E-E2175021C697&filename=Ferroglobe_-_Investor_Presentation.pdf, accessed March 24, 2017.

[20] Roskill Information Services Ltd., *Silicon and Ferrosilicon: Global Industry Markets and Outlook, Thirteenth Edition, 2011*, para. 5.9.1.

[21] Ibid.

[22] *Silicon Metal From Russia: Investigation No. 731-TA-991 (Second Review)*, USITC Publication 4471, June 2014), pp. IV-5 – IV-6.

[23] Globe Specialty Metals, Inc., http://www.glbsm.com/quebecsilicon/, accessed March 28, 2017.

[24] *Ferroglobe - Investor Presentation - May 2016*, http://investor.ferroglobe.com/common/download/download.cfm?companyid=AMDA-5STP82&fileid=925388&filekey=06493FD0-3C33-49AE-A17E-63A4ED53FEB3&filename=Ferroglobe_-_Investor_Presentation.pdf, accessed March 28, 2017.

Iceland

Silicon metal production is expected to increase in Iceland owing to a new smelter that opened in late 2016 and other smelters that are in different stages of development. ***.[25]

In early 2015, Petro Carbo Chem BakkiSilicon HF began construction on its new silicon metal smelter in Husavik. The plant was expected to open in 2018, and have the capacity to produce about 35,000 short tons of silicon metal per year. The company expected that the majority of the silicon produced would be sold to customers in Germany.[26]

In September 2015, Silicor Materials, Inc., secured $105 million in equity capital agreements to support the construction of its $1 billion commercial-scale solar-grade silicon metal manufacturing operation in Grundartangi.[27] The company expected that at full capacity, the plant would produce about 21,000 short tons of solar grade silicon metal per year. Construction of the plant was expected to take about two years but a start date had not been announced.[28]

In November 2016, United Silicon HF (USi), opened a silicon metal smelter, near Helguvik.[29] It was the first silicon smelter built in Iceland. The company uses geothermal and hydro power sources to run the plant and imports selected quartz and reductants. At full production capacity, the plant can produce 24,000 short tons of silicon metal per year. The company planned to expand production capacity in the future.[30]

Thorsil ehf is planning to build a new silicon metal plant in Helguvik. The company acquired financing for two submerged arc furnaces but it was not clear when construction would begin.[31]

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[25] Joint Respondents' postconference brief, p. 481.

[26] *Official start of construction for PCC's silicon metal project in Iceland,* PCC, February 15, 2016, http://www.pcc.eu/official-start-of-construction-for-pccs-silicon-metal-project-in-iceland/?lang=en, accessed March 24, 2017.

[27] *Silicor Materials Closes $105M in Equity Capital Commitments for Iceland Manufacturing Plant,* September 16, 2016, Silicor Materials, Inc., http://www.silicormaterials.com/news-a-event/press-releases/92-silicor-materials-closes-105m-in-equity-capital-commitments-for-iceland-manufacturing-plant.html, accessed March 24, 2017.

[28] *Silicor Sees Cost Advantage in $1 Billion Icelandic Solar Plant,* Bloomberg, August 31, 2016, https://www.bloomberg.com/news/articles/2016-09-01/silicor-sees-cost-advantage-in-1-billion-icelandic-solar-plant, accessed March 24, 2017.

[29] *First Silicon Metal casting in Iceland,* Fondel, November 2016, https://fondel.com/news/first-silicon-metal-casting-in-iceland, accessed March 24, 2017.

[30] United Silicon website, https://fondel.com/companies/united-silicon, accessed March 24, 2017.

[31] *Thorsil metallurgical grade Silicon slant, Helguvik, Iceland*, Export Credit Norway, June 27, 2016, http://www.eksportkreditt.no/en-GB/52ABOUT-EXPORT-CREDIT-NORWAY/CSR-Engelsk/Category-A-and-B-projects/Thorsil-Metallurgical-Grade-Silicon-Plant-Helguvik-Iceland-Category-A/, accessed March 4, 2017.

South Africa

There are two plants producing silicon metal in South Africa, both owned by Ferroglobe. The plants have the capacity to produce about 74,000 shorts tons of silicon metal per year.[32] In 2016, the United States and Korea were the leading destinations for silicon metal exported from South Africa, accounting for about 63 percent and 21 percent, respectively, of total exports (table VII-25).

Thailand

In Thailand, G.S. Energy Co., Ltd., began operations in 2008. The company has manufacturing facilities in Ratchaburi with capacity to produce 49,600 short tons of silicon metal per year. [33] Output is almost all exported to Asia and the United States.

In 2015, Sica New Materials Co., Ltd., began producing silicon metal at its facilities in Kanchanaburi. The company was adding production capacity in phases and planned to have the capacity to produce about 99,200 short tons of silicon per year when the project was completed.[34]

United Arab Emirates

Silicon Metal of Abu Dhabi plans to build a silicon plant in the Khalifa Port Industrial Zone, Taweelah. The plant would be the first silicon metal smelter in the Middle East, initially producing 36,000 short tons of silicon per year, though the company planned to double that capacity in the future.[35]

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[32] *Ferroglobe - Investor Presentation - May 2016*, http://investor.ferroglobe.com/common/download/download.cfm?companyid=AMDA-5STP82&fileid=925388&filekey=06493FD0-3C33-49AE-A17E-63A4ED53FEB3&filename=Ferroglobe_-_Investor_Presentation.pdf, accessed March 28, 2017.

[33] G.S. Energy Co., Ltd., http://www.gsi99g.com/en/, accessed March 28, 2017.

[34] Sica New Materials Co., Ltd., http://www.sica-mtl.com/index.php, accessed March 28, 2017.

[35] Al-Braik Investments LLC website, http://www.albraik.ae/Silicon_Metal.html, accessed April 5, 2017.

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
82 FR 13653 March 14, 2017	*Silicon Metal From Australia, Brazil, Kazakhstan, and Norway; Institution of Antidumping and Countervailing Duty Investigations and Scheduling of Preliminary Phase Investigations*	https://www.gpo.gov/fdsys/pkg/FR-2017-03-14/pdf/2017-04994.pdf
82 FR 16352 April 4, 2017	*Silicon Metal From Australia, Brazil and Norway: Initiation of Less-Than-Fair-Value Investigations*	https://www.gpo.gov/fdsys/pkg/FR-2017-04-04/pdf/2017-06621.pdf
82 FR 16356 April 4, 2017	*Silicon Metal From Australia, Brazil, and Kazakhstan: Initiation of Countervailing Duty Investigations*	https://www.gpo.gov/fdsys/pkg/FR-2017-04-04/pdf/2017-06622.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: Silicon Metal from Australia, Brazil, Kazakhstan, and Norway

Inv. Nos.: 701-TA-567-569 and 731-TA-1343-1345 (Preliminary)

Date and Time: March 29, 2017 - 9:30 a.m.

Sessions were held in connection with these preliminary phase investigations in Courtroom B (room 111), 500 E Street, S.W., Washington, DC.

In Support of the Imposition of
Antidumping and Countervailing Duty Orders:

DLA Piper LLP (US)
Washington, DC
on behalf of

Globe Specialty Metals, Inc. ("GSM")

J. Marlin Perkins, Vice President – Sales, Globe Metallurgical Inc.

Duane Huck, Corporate Manager, IT & Business Information Systems, Globe Metallurgical Inc.

Jennifer Lutz, Senior Economist, Economic Consulting Services, LLC

William D. Kramer)
) – OF COUNSEL
Martin Schaefermeier)

In Opposition to the Imposition of
Antidumping and Countervailing Duty Orders:

Hogan Lovells US LLP
Washington, DC
on behalf of

Wacker Chemicals Norway AS
Wacker Polysilicon North America, LLC
Wacker Chemie AG

Mary Beth Hudson, Vice President, Wacker Polysilicon North America, LLC

Brian Eftink, Vice President, Legal, Wacker Chemical Corporation

Dr. Ralf Widmer, Senior Counsel, Wacker Chemie AG

Oliver Majumdar, Director, Raw Materials Procurement, Wacker Chemie AG

Dr. Kivanc Kirgiz, Vice President, Cornerstone Research

Craig A. Lewis)
Jared R. Wessel) – OF COUNSEL
Michael G. Jacobson)

Hogan Lovells US LLP
Washington, DC
on behalf of

Simcoa Operations Pty. Ltd.
Shintech Inc.

John Bednarczyk, Regional Sales Manager, Shin-Tech Inc.

Tom Walters, Vice President for Trading, Service Aluminum Corporation

Dr. Kivanc Kirgiz, Vice President, Cornerstone Research

Jonathan T. Stoel)
) – OF COUNSEL
Jared R. Wessel)

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

Brinks Gilson & Lione
Washington, DC
on behalf of

Ligas de Aluminio S/A – LIASA ("LIASA")
Companhia Ferroligas Minas-Gerais – MINASLIGAS

Thales X. Augusto, Sales Manager, LIASA

Lyle B. Vander Schaaf) – OF COUNSEL

Mayer Brown LLP
Washington, DC
on behalf of

MPM Holdings Inc.

John Moran, General Counsel, MPM Holdings Inc.

Sydney H. Mintzer) – OF COUNSEL

Smirnow Law
Washington, DC
on behalf of

REC Silicon

Chris Bowes, Director of Global Procurement and
Investor Relations, REC Silicon

John P. Smirnow) – OF COUNSEL

APPENDIX C

SUMMARY DATA

Table C-1
Silicon metal: Summary data concerning the U.S. market, 2014-16

(Quantity=short tons contained silicon; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per STCS; Period changes=percent--exceptions noted)

	Reported data			Period changes		
	Calendar year			Calendar year		
	2014	2015	2016	2014-16	2014-15	2015-16
U.S. consumption quantity:						
Amount	***	***	***	***	***	***
Producers' share (fn1)	***	***	***	***	***	***
Importers' share (fn1):						
Australia	***	***	***	***	***	***
Brazil	***	***	***	***	***	***
Kazakhstan	***	***	***	***	***	***
Norway	***	***	***	***	***	***
Subject sources	***	***	***	***	***	***
Nonsubject sources	***	***	***	***	***	***
All import sources	***	***	***	***	***	***
U.S. consumption value:						
Amount	***	***	***	***	***	***
Producers' share (fn1)	***	***	***	***	***	***
Importers' share (fn1):						
Australia	***	***	***	***	***	***
Brazil	***	***	***	***	***	***
Kazakhstan	***	***	***	***	***	***
Norway	***	***	***	***	***	***
Subject sources	***	***	***	***	***	***
Nonsubject sources	***	***	***	***	***	***
All import sources	***	***	***	***	***	***
U.S. imports from:						
Australia:						
Quantity	19,977	22,046	18,459	(7.6)	10.4	(16.3)
Value	52,516	58,984	34,586	(34.1)	12.3	(41.4)
Unit value	$2,629	$2,676	$1,874	(28.7)	1.8	(30.0)
Ending inventory quantity	***	***	***	***	***	***
Brazil:						
Quantity	83,725	51,888	68,340	(18.4)	(38.0)	31.7
Value	219,760	140,482	158,897	(27.7)	(36.1)	13.1
Unit value	$2,625	$2,707	$2,325	(11.4)	3.1	(14.1)
Ending inventory quantity	***	***	***	***	***	***
Kazakhstan:						
Quantity	0	3,006	10,367	***	***	244.9
Value	0	6,691	17,441	***	***	160.7
Unit value	$0	$2,226	$1,682	***	***	(24.4)
Ending inventory quantity	***	***	***	***	***	***
Norway:						
Quantity	14,753	14,399	14,398	(2.4)	(2.4)	(0.0)
Value	42,151	37,401	29,771	(29.4)	(11.3)	(20.4)
Unit value	$2,857	$2,597	$2,068	(27.6)	(9.1)	(20.4)
Ending inventory quantity	***	***	***	***	***	***
Subject sources:						
Quantity	118,455	91,340	111,564	(5.8)	(22.9)	22.1
Value	314,427	243,557	240,694	(23.4)	(22.5)	(1.2)
Unit value	$2,654	$2,667	$2,157	(18.7)	0.5	(19.1)
Ending inventory quantity	***	***	***	***	***	***
Nonsubject sources:						
Quantity	93,105	88,455	55,090	(40.8)	(5.0)	(37.7)
Value	238,782	236,561	126,834	(46.9)	(0.9)	(46.4)
Unit value	$2,565	$2,674	$2,302	(10.2)	4.3	(13.9)
Ending inventory quantity	***	***	***	***	***	***
All import sources:						
Quantity	211,560	179,795	166,655	(21.2)	(15.0)	(7.3)
Value	553,210	480,118	367,528	(33.6)	(13.2)	(23.5)
Unit value	$2,615	$2,670	$2,205	(15.7)	2.1	(17.4)
Ending inventory quantity	***	***	***	***	***	***

Table continued on next page.

Table C-1--Continued
Silicon metal: Summary data concerning the U.S. market, 2014-16
(Quantity=short tons contained silicon; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per STCS; Period changes=percent--exceptions noted)

	Reported data			Period changes		
	Calendar year			Calendar year		
	2014	2015	2016	2014-16	2014-15	2015-16
U.S. producers':						
Average capacity quantity	***	***	***	***	***	***
Production quantity	***	***	***	***	***	***
Capacity utilization (fn1)	***	***	***	***	***	***
U.S. shipments:						
Quantity	***	***	***	***	***	***
Value	***	***	***	***	***	***
Unit value	***	***	***	***	***	***
Export shipments:						
Quantity	***	***	***	***	***	***
Value	***	***	***	***	***	***
Unit value	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***
Inventories/total shipments (fn1)	***	***	***	***	***	***
Production workers	***	***	***	***	***	***
Hours worked (1,000s)	***	***	***	***	***	***
Wages paid ($1,000)	***	***	***	***	***	***
Hourly wages (dollars)	***	***	***	***	***	***
Productivity (short tons per 1,000 hours)	***	***	***	***	***	***
Unit labor costs	***	***	***	***	***	***
Net sales:						
Quantity	***	***	***	***	***	***
Value	***	***	***	***	***	***
Unit value	***	***	***	***	***	***
Cost of goods sold (COGS)	***	***	***	***	***	***
Gross profit or (loss)	***	***	***	***	***	***
SG&A expenses	***	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***	***
Net income or (loss)	***	***	***	***	***	***
Capital expenditures	***	***	***	***	***	***
Unit COGS	***	***	***	***	***	***
Unit SG&A expenses	***	***	***	***	***	***
Unit operating income or (loss)	***	***	***	***	***	***
Unit net income or (loss)	***	***	***	***	***	***
COGS/sales (fn1)	***	***	***	***	***	***
Operating income or (loss)/sales (fn1)	***	***	***	***	***	***
Net income or (loss)/sales (fn1)	***	***	***	***	***	***

Notes:

fn1.--Reported data are in percent and period changes are in percentage points.

Source: Compiled from data submitted in response to Commission questionnaires and official U.S. imports statistics (see part IV for details).

Table C-2
Silicon metal: Summary data concerning the U.S. market excluding *, 2014-16**

(Quantity=short tons contained silicon; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per STCS; Period changes=percent--exceptions noted)

	Reported data			Period changes		
	Calendar year			Calendar year		
	2014	2015	2016	2014-16	2014-15	2015-16
U.S. consumption quantity:						
Amount	***	***	***	***	***	***
Producers' share (fn1):						
Included producers	***	***	***	***	***	***
Excluded producers	***	***	***	***	***	***
All U.S. producers	***	***	***	***	***	***
Importers' share (fn1):						
Australia	***	***	***	***	***	***
Brazil	***	***	***	***	***	***
Kazakhstan	***	***	***	***	***	***
Norway	***	***	***	***	***	***
Subject sources	***	***	***	***	***	***
Nonsubject sources	***	***	***	***	***	***
All import sources	***	***	***	***	***	***
U.S. consumption value:						
Amount	***	***	***	***	***	***
Producers' share (fn1):						
Included producers	***	***	***	***	***	***
Excluded producers	***	***	***	***	***	***
All U.S. producers	***	***	***	***	***	***
Importers' share (fn1):						
Australia	***	***	***	***	***	***
Brazil	***	***	***	***	***	***
Kazakhstan	***	***	***	***	***	***
Norway	***	***	***	***	***	***
Subject sources	***	***	***	***	***	***
Nonsubject sources	***	***	***	***	***	***
All import sources	***	***	***	***	***	***
U.S. imports from:						
Australia:						
Quantity	19,977	22,046	18,459	(7.6)	10.4	(16.3)
Value	52,516	58,984	34,586	(34.1)	12.3	(41.4)
Unit value	$2,629	$2,676	$1,874	(28.7)	1.8	(30.0)
Ending inventory quantity	***	***	***	***	***	***
Brazil:						
Quantity	83,725	51,888	68,340	(18.4)	(38.0)	31.7
Value	219,760	140,482	158,897	(27.7)	(36.1)	13.1
Unit value	$2,625	$2,707	$2,325	(11.4)	3.1	(14.1)
Ending inventory quantity	***	***	***	***	***	***
Kazakhstan:						
Quantity	0	3,006	10,367	***	***	244.9
Value	0	6,691	17,441	***	***	160.7
Unit value	$0	$2,226	$1,682	***	***	(24.4)
Ending inventory quantity	***	***	***	***	***	***
Norway:						
Quantity	14,753	14,399	14,398	(2.4)	(2.4)	(0.0)
Value	42,151	37,401	29,771	(29.4)	(11.3)	(20.4)
Unit value	$2,857	$2,597	$2,068	(27.6)	(9.1)	(20.4)
Ending inventory quantity	***	***	***	***	***	***
Subject sources:						
Quantity	118,455	91,340	111,564	(5.8)	(22.9)	22.1
Value	314,427	243,557	240,694	(23.4)	(22.5)	(1.2)
Unit value	$2,654	$2,667	$2,157	(18.7)	0.5	(19.1)
Ending inventory quantity	***	***	***	***	***	***

Table continued on next page.

Table C-2--Continued
Silicon metal: Summary data concerning the U.S. market excluding *, 2014-16**
(Quantity=short tons contained silicon; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per STCS; Period changes=percent--exceptions noted)

	Reported data			Period changes		
	Calendar year			Calendar year		
	2014	2015	2016	2014-16	2014-15	2015-16
U.S. imports from:						
Nonsubject sources:						
Quantity	93,105	88,455	55,090	(40.8)	(5.0)	(37.7)
Value	238,782	236,561	126,834	(46.9)	(0.9)	(46.4)
Unit value	$2,565	$2,674	$2,302	(10.2)	4.3	(13.9)
Ending inventory quantity	***	***	***	***	***	***
All import sources:						
Quantity	211,560	179,795	166,655	(21.2)	(15.0)	(7.3)
Value	553,210	480,118	367,528	(33.6)	(13.2)	(23.5)
Unit value	$2,615	$2,670	$2,205	(15.7)	2.1	(17.4)
Ending inventory quantity	***	***	***	***	***	***
U.S. producers' excluding ***:						
Average capacity quantity	***	***	***	***	***	***
Production quantity	***	***	***	***	***	***
Capacity utilization (fn1)	***	***	***	***	***	***
U.S. shipments:						
Quantity	***	***	***	***	***	***
Value	***	***	***	***	***	***
Unit value	***	***	***	***	***	***
Export shipments:						
Quantity	***	***	***	***	***	***
Value	***	***	***	***	***	***
Unit value	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***
Inventories/total shipments (fn1)	***	***	***	***	***	***
Production workers	***	***	***	***	***	***
Hours worked (1,000s)	***	***	***	***	***	***
Wages paid ($1,000)	***	***	***	***	***	***
Hourly wages (dollars)	***	***	***	***	***	***
Productivity (short tons per 1,000 hours)	***	***	***	***	***	***
Unit labor costs	***	***	***	***	***	***
Net sales:						
Quantity	***	***	***	***	***	***
Value	***	***	***	***	***	***
Unit value	***	***	***	***	***	***
Cost of goods sold (COGS)	***	***	***	***	***	***
Gross profit or (loss)	***	***	***	***	***	***
SG&A expenses	***	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***	***
Net income or (loss)	***	***	***	***	***	***
Capital expenditures	***	***	***	***	***	***
Unit COGS	***	***	***	***	***	***
Unit SG&A expenses	***	***	***	***	***	***
Unit operating income or (loss)	***	***	***	***	***	***
Unit net income or (loss)	***	***	***	***	***	***
COGS/sales (fn1)	***	***	***	***	***	***
Operating income or (loss)/sales (fn1)	***	***	***	***	***	***
Net income or (loss)/sales (fn1)	***	***	***	***	***	***

Notes:

fn1.--Reported data are in percent and period changes are in percentage points.

Source: Compiled from data submitted in response to Commission questionnaires and official U.S. imports statistics (see part IV for details).

APPENDIX D

MONTHLY APPARENT U.S. CONSUMPTION

Table D-1 presents monthly apparent consumption data for silicon metal in the United States from January 2014 through December 2016. Table D-2 and figure D-1 present monthly U.S. market shares from January 2014 through December 2016.

Table D-1
Silicon metal: Monthly apparent U.S. consumption, January 2014 through December 2016

Item	U.S. producers' U.S. shipments	U.S. imports from.--			Apparent U.S. consumption
		Subject sources	Nonsubject sources	All import sources	
	Quantity (short tons contained silicon)				
2014.--					
January	***	12,328	5,620	17,948	***
February	***	11,302	3,938	15,240	***
March	***	9,774	10,541	20,314	***
April	***	7,970	6,552	14,522	***
May	***	8,544	8,862	17,406	***
June	***	9,586	6,770	16,356	***
July	***	11,932	7,847	19,779	***
August	***	8,404	7,637	16,041	***
September	***	9,445	11,381	20,825	***
October	***	11,090	4,890	15,980	***
November	***	8,967	7,841	16,809	***
December	***	9,112	11,226	20,338	***
2015.--					
January	***	9,459	7,820	17,278	***
February	***	7,211	8,312	15,523	***
March	***	7,778	8,828	16,607	***
April	***	9,567	7,392	16,959	***
May	***	6,755	7,196	13,951	***
June	***	8,933	8,306	17,239	***
July	***	8,750	7,562	16,312	***
August	***	8,030	7,294	15,324	***
September	***	4,160	5,274	9,434	***
October	***	5,432	5,367	10,799	***
November	***	8,363	7,339	15,701	***
December	***	6,902	7,765	14,668	***
2016.--					
January	***	6,645	7,563	14,208	***
February	***	4,474	5,943	10,416	***
March	***	10,377	7,528	17,905	***
April	***	7,205	4,545	11,750	***
May	***	5,916	8,510	14,426	***
June	***	12,411	2,799	15,210	***
July	***	11,363	3,817	15,180	***
August	***	13,776	2,577	16,353	***
September	***	8,666	2,548	11,213	***
October	***	9,496	4,499	13,994	***
November	***	12,204	2,843	15,047	***
December	***	9,032	1,920	10,952	***

Source: Compiled from data submitted in response to Commission questionnaires and official U.S. imports based on General Imports using statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed on March 16, 2017.

Table D-2
Silicon metal: Monthly market shares, January 2014 through December 2016

* * * * * * *

Figure D-1
Silicon metal: Monthly U.S. market shares, by source, January 2014 through December 2016

* * * * * * *

APPENDIX E

NONSUBJECT COUNTRY PRICE DATA

*** reported price data for South Africa for products 1-3. Price data reported by *** accounted for *** percent of U.S. commercial shipments from South Africa during January 2014-December 2016. These price items and accompanying data are comparable to those presented in tables V-3 to V-5. Price and quantity data for South Africa are shown in tables E-1 to E-3 and in figure-1 to E-3 (with domestic and subject sources). Additionally, direct import cost data were reported for the equivalent of pricing product 3 and are presented in table E-3.

In comparing nonsubject country pricing data with U.S. producer pricing data, prices for product imported from South Africa were lower than prices for U.S.-produced product in 20 instances and higher in 13 instances. In comparing nonsubject country pricing data with subject country pricing data, prices for product imported from South Africa were lower than prices for product imported from subject countries in nine instances and higher in 24 instances. A summary of price differentials is presented in table E-4.[1]

Table E-1
Silicon metal: Weighted-average f.o.b. prices and quantities of domestic and imported product 1[1] and margins of underselling/(overselling), by quarters, January 2014-December 2016

* * * * * * *

Table E-2
Silicon metal: Weighted-average f.o.b. prices and quantities of domestic and imported product 2[1] and margins of underselling/(overselling), by quarters, January 2014-December 2016

* * * * * * *

Table E-3
Silicon metal: Weighted-average f.o.b. prices (or LDP values) and quantities of domestic and imported product 3[1] and margins of underselling/(overselling), by quarters, January 2014-December 2016

* * * * * * *

Figure E-1
Silicon metal: Weighted-average f.o.b. prices and quantities of domestic and imported product 1[1] and margins of underselling/(overselling), by quarters, January 2014-December 2016

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Figure E-2
Silicon metal: Weighted-average f.o.b. prices and quantities of domestic and imported product 2[1] and margins of underselling/(overselling), by quarters, January 2014-December 2016

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[1] Direct import purchase cost data are not included in these price comparisons.

Figure E-3
Silicon metal: Weighted-average f.o.b. prices and quantities of domestic and imported product 3[1] and margins of underselling/(overselling), by quarters, January 2014-December 2016

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Table E-4

Silicon metal: Summary of underselling/(overselling), by country, January 2014-December 2016

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