Silicon Metal from Bosnia and Herzegovina, Iceland, Kazakhstan, and Malaysia

Investigation Nos. 701-TA-652 and 731-TA-1524-1526 (Preliminary)

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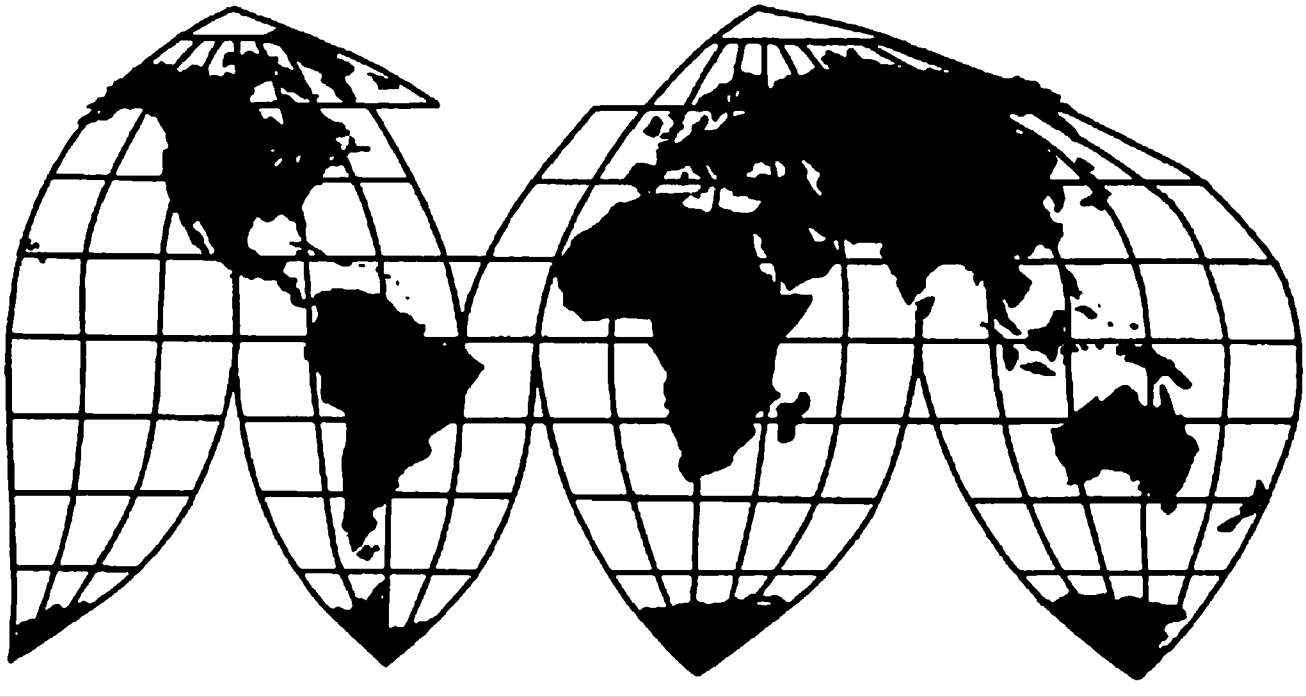

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Address all communications to
Secretary to the Commission
United States International Trade Commission
Washington, DC 20436

U.S. International Trade Commission

Washington, DC 20436
www.usitc.gov

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Note.—Information that would reveal confidential operations of individual concerns may not be published. Such information is identified by brackets in confidential reports and is deleted and replaced with asterisks (***) in public reports.

UNITED STATES INTERNATIONAL TRADE COMMISSION

Investigation Nos. 701-TA-652 and 731-TA-1524-1526 (Preliminary)

Silicon Metal from Bosnia and Herzegovina, Iceland, Kazakhstan, and Malaysia

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 Bosnia and Herzegovina, Iceland, and Malaysia, 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 in the United States at less than fair value ("LTFV") and imports of subject merchandise from Kazakhstan alleged to be subsidized by the Government of Kazakhstan.[2]

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 U.S. 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

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

[2] 85 FR 45173 and 85 FR 45177 (July 27, 2020).

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 June 30, 2020, Globe Specialty Metals, Inc., Beverly, Ohio, and Mississippi Silicon LLC, Burnsville, Mississippi, filed petitions 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 Kazakhstan and LTFV imports of silicon metal from Bosnia and Herzegovina, Iceland, and Malaysia. Accordingly, effective June 30, 2020, the Commission instituted countervailing duty investigation No. 701-TA-652 and antidumping duty investigation Nos. 731-TA-1524-1526 (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 July 8, 2020 (85 FR 41063). In light of the restrictions on access to the Commission building due to the COVID–19 pandemic, the Commission conducted its conference through written questions, submissions of opening remarks and written testimony, written responses to questions, and postconference briefs. All persons who requested the opportunity were permitted to participate.

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 Bosnia and Herzegovina, Iceland, and Malaysia that are allegedly sold in the United States at less than fair value and imports of the subject merchandise from Kazakhstan that are allegedly subsidized by the government of 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

Parties to the Investigation. Globe Specialty Metals, Inc. ("Globe") and Mississippi Silicon LLC ("Mississippi Silicon") (collectively, "petitioners"), domestic producers of silicon metal, filed the petitions in these investigations on June 30, 2020. Petitioners filed a written opening statement by counsel and written testimony by two witnesses (one from each petitioning firm) for the staff conference and submitted a postconference brief. [3]

Several respondent entities participated as parties in these investigations. PCC BakkiSilicon hf ("PCC"), a producer and exporter of subject merchandise from Iceland,

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

[3] In light of the restrictions on access to the Commission building due to the COVID-19 pandemic, the Commission conducted its conference in these investigations through opening remarks, written questions and responses, and submissions of written testimony, as well as post-conference briefs as set forth in procedures provided to the parties.

submitted written responses to staff questions following the conference. Wacker Polysilicon North America LLC ("WPNA"), Wacker Chemical Corporation, and Wacker Chemie AG (collectively, "Wacker"), U.S. importers and purchasers of silicon metal and their German parent company, submitted written witness testimony for the conference and written responses to staff questions following the conference. The Ministry of Trade and Integration of the Republic of Kazakhstan (the "Kazakhstan Ministry") filed a written submission with the Commission prior to the conference, as did Tau-Ken Tamir LLP ("TKT"), a producer of subject merchandise from Kazakhstan.

Data Coverage. U.S. industry data are based on the questionnaire responses of three producers, accounting for all known U.S. production of silicon metal in 2019.[4] U.S. import data are based on official U.S. Department of Commerce ("Commerce") import statistics and from usable questionnaire responses from *** U.S. importers, accounting for *** percent of total subject imports in 2019 and *** subject imports from Bosnia and Herzegovina, *** percent of subject imports from Iceland, *** percent of subject imports from Kazakhstan, *** percent of subject imports from Malaysia, *** percent of total imports from nonsubject sources, and *** percent of imports from all sources during 2019.[5] The Commission received responses to its questionnaires from four foreign producers of subject merchandise: one producer/exporter in Bosnia and Herzegovina, estimated to account for *** production of subject merchandise in Bosnia and Herzegovina in 2019; one producer/exporter in Iceland, estimated to account for *** production of subject merchandise in Iceland in 2019; one producer/exporter in Kazakhstan, estimated to account for *** production of subject merchandise in Kazakhstan in 2019; and one producer/exporter in Malaysia, estimated to account for *** production of subject merchandise in Malaysia in 2019.[6]

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

[4] Confidential Report ("CR") at I-4, III-1; Public Report ("PR") at I-4, III-1.

[5] CR/PR at I-4, IV-1.

[6] CR/PR at VII-3 (Bosnia and Herzegovina), VII-7 to VII-8 (Iceland), VII-15 (Kazakhstan), VII-19 to VII-20 (Malaysia). Exports to the United States from the one reporting firm in Bosnia and Herzegovina accounted for *** percent of U.S. imports of silicon metal from Bosnia and Herzegovina in 2019; exports to the United States from the one reporting firm in Iceland accounted for *** percent of U.S. imports of silicon metal from Iceland in 2019; exports to the United States from the one reporting firm in Kazakhstan accounted for *** percent of U.S. imports of silicon metal from Kazakhstan in 2019; and exports to the United States from the one reporting firm in Malaysia accounted for *** U.S. imports of silicon metal from Malaysia in 2019. *Id.* at I-4.

"industry."[7] Section 771(4)(A) of the Tariff Act of 1930, as amended ("the Tariff Act"), defines the relevant domestic industry as the "producers as a whole of a domestic like product, or those producers whose collective output of a domestic like product constitutes a major proportion of the total domestic production of the product."[8] In turn, the Tariff Act defines "domestic like product" as "a product which is like, or in the absence of like, most similar in characteristics and uses with, the article subject to an investigation."[9]

By statute, the Commission's "domestic like product" analysis begins with the "article subject to an investigation," *i.e.*, the subject merchandise as determined by Commerce.[10] Therefore, Commerce's determination as to the scope of the imported merchandise that is subsidized and/or sold at less than fair value is "necessarily the starting point of the Commission's like product analysis."[11] The Commission then defines the domestic like product in light of the imported articles Commerce has identified.[12] 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.[13] No single factor is dispositive, and the Commission may

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[7] 19 U.S.C. § 1677(4)(A).

[8] 19 U.S.C. § 1677(4)(A).

[9] 19 U.S.C. § 1677(10).

[10] 19 U.S.C. § 1677(10). 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. *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).

[11] *Cleo Inc. v. United States*, 501 F.3d 1291, 1298 (Fed. Cir. 2007); *see also Hitachi Metals, Ltd. v. United States*, Case No. 19-1289, slip op. at 8-9 (Fed. Cir. Feb. 7, 2020) (the statute requires the Commission to start with Commerce's subject merchandise in reaching its own like product determination).

[12] *Cleo*, 501 F.3d at 1298 n.1 ("Commerce's {scope} finding does not control the Commission's {like product} determination."); *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); *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).

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

consider other factors it deems relevant based on the facts of a particular investigation.[14] The Commission looks for clear dividing lines among possible like products and disregards minor variations.[15] The Commission may, where appropriate, define the domestic like product broader than that described in the scope.[16]

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

> 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 this investigation.
>
> Silicon metal is currently classifiable under subheadings 2804.69.1000 and 2804.69.5000 of the HTSUS. While the HTSUS numbers are provided for convenience and customs purposes, the written description of the scope remains dispositive.[17]

Silicon metal is composed almost exclusively of elemental silicon with a small amount of impurities such as iron, calcium, and aluminum. Silicon metal is used in a variety of applications, which include aluminum (automobiles/commercial), chemicals (silicones), and polycrystalline silicon ("polysilicon") (solar and electronics).[18]

Silicon metal "grades" refer to ranges of specifications that are typically sold to particular types of customers. These specifications establish the minimum amounts of silicon and the maximum amounts of other elements, such as boron, iron, calcium, and aluminum that

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

[15] *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.").

[16] *See*, *e.g.*, *Pure Magnesium from China and Israel*, Inv. Nos. 701-TA-403 and 731-TA-895-96 (Final), USITC Pub. 3467 at 8 n.34 (Nov. 2001); *Torrington,* 747 F. Supp. at 748-49 (holding that the Commission is not legally required to limit the domestic like product to the product advocated by the petitioner, co-extensive with the scope).

[17] *Silicon Metal from Bosnia and Herzegovina, Iceland, and Malaysia: Initiation of Less-Than-Fair-Value Investigations*, 85 Fed. Reg. 45177, 45180-45181 (July 27, 2020); *Silicon Metal from the Republic of Kazakhstan: Initiation of Countervailing Duty Investigation*, 85 Fed. Reg. 45173, 45176-45177 (July 27, 2020).

[18] CR/PR at I-3, I-8 to I-9.

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. There are four broadly defined categories, or grades, of silicon metal: (1) semiconductor grade; (2) chemical grade; (3) metallurgical grade used to produce primary aluminum; and (4) metallurgical grade used to produce secondary aluminum.[19]

A. Arguments of the Parties

Petitioners' Argument. Petitioners argue that the Commission should define a single domestic like product that is coextensive with the scope consisting of all forms and sizes of silicon metal, including silicon metal powder. They contend that all silicon metal has the same or similar physical characteristics with only minor physical differences among different grades, some overlapping uses, share the same primary channel of distribution, are perceived by producers and customers to be a single product, and have common production processes, facilities and employees.[20] Petitioners also argue that within any given grade, silicon metal is entirely interchangeable, and that higher grade silicon metal is substitutable for lower grade product.[21] Petitioners assert that there are relatively minor differences in price among grades of silicon metal.[22]

Respondents' Argument. No respondent party has addressed the definition of the domestic like product.

B. Analysis

Based on the record, we define a single domestic like product consisting of silicon metal, coextensive with Commerce's scope.

Physical Characteristics and Uses. Silicon metal is composed almost exclusively of elemental silicon with a small amount of impurities such as iron, calcium, and aluminum. It is manufactured and sold in various degrees of purity. Customer specifications establish the minimum amount of silicon and the maximum amounts of other elements that silicon metal sold to the customer may contain.[23] Silicon metal is used as an alloying agent in the production of both primary aluminum (produced from ore) and secondary aluminum (produced from

[19] CR/PR at 1-10 to I-11.
[20] Petitioners' Postconference Brief, Answers to Staff Questions, at 15-20.
[21] Petitioners' Postconference Brief, Answers to Staff Questions, at 15-18.
[22] Petitioners' Postconference Brief, Answers to Staff Questions, at 20.
[23] CR/PR at I-3, I-7 to I-8; Written Conference Testimony of Christopher Bowes at 2.

scrap), often for automotive end uses.[24] In the chemical industry, silicon metal is used to produce a family of organic compounds known as silicones, which are used for a variety of applications, including adhesives, resins, lubricants, plastomers, anti-foaming agents, and water-repellent compounds. Silicon metal is also used by chemical producers to produce polysilicon, a high-purity form of silicon that is primarily used in semiconductors and solar cells.[25]

Manufacturing Facilities, Production Processes and Employees. In general, all silicon metal, regardless of specification, is produced using essentially the same process and inputs. Silicon metal is produced in submerged-arc electric furnaces, using a highly energy-intensive smelting process.[26] The record indicates that silicon metal producers typically manufacture different grades of silicon metal using the same inputs, facilities, furnaces, and employees, and that as long as the raw materials are of sufficient quality, all specifications or grades of silicon metal can be produced on the same equipment with the same input materials.[27]

Channels of Distribution. A substantial majority of U.S. commercial shipments by domestic producers went to polysilicon and chemical producer end users during the January 2017-March 2020 period of investigation ("POI").[28] In addition, a significant percentage went to secondary aluminum producer end users.[29] Smaller percentages went to primary aluminum producer end users, other end users, and distributors.[30]

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[24] Primary aluminum typically contains between 8-12 percent silicon and is used in applications where appearance is important, such as wheels for automobiles. Secondary aluminum typically contains less silicon than primary aluminum and is used for internal automobile parts and applications where appearance is not as important. CR/PR at I-3, I-8 to I-9.

[25] CR/PR at I-3, I-8 to I-9.

[26] CR/PR at I-11; Written Conference Testimony of Christopher Bowes at 2.

[27] Petitioners' Postconference Brief, Answers to Staff Questions, at 3, 19-20. Respondent Wacker states that all grades of silicon metal can be produced with the same input materials and the same equipment. Wacker's Response to Staff Questions at 8.

[28] The percentage of U.S. commercial shipments by domestic producers going to polysilicon and chemical producers ranged between *** percent and *** percent during the three calendar years of the POI, and was *** percent in January-March ("interim") 2019 and *** percent in interim 2020. CR/PR at Table II-1.

[29] The percentage of U.S. commercial shipments by domestic producers going to secondary aluminum producers ranged between *** percent and *** percent during the three calendar years of the POI, and was *** percent in interim 2019 and *** percent in interim 2020. *Id.*

[30] The percentage of U.S. commercial shipments by domestic producers going to primary aluminum producers ranged between *** percent and *** percent during the three calendar years of the POI, and was *** percent in interim 2019 and *** percent in interim 2020. The percentage of U.S. commercial shipments by domestic producers going to other end users ranged between *** percent and *** percent during the three calendar years of the POI, and was *** percent in interim 2019 and *** percent in interim 2020. The percentage of U.S. commercial shipments by domestic producers (Continued…)

Interchangeability. Petitioners have presented testimony that silicon metal produced to the same specifications (or of the same "grade") is entirely interchangeable, and that silicon metal of a "higher grade" can be, and frequently is, used for a "lower grade" application.[31] While respondents argue that silicon metal of different grades is not interchangeable, and dispute that higher grade silicon metal is used in lower grade applications,[32] there appears to be no dispute that silicon metal from different domestic sources produced to the same specifications is interchangeable.

Producer and Customer Perceptions. Petitioners assert that both producers and customers consider silicon metal within the scope to be a single product.[33] However, the record in these preliminary phase investigations is otherwise limited with respect to producer and customer perceptions.

Price. Petitioners contend that there are relatively minor differences in price between different grades of silicon metal.[34] Respondent PCC contends that chemical grade silicon metal commands a higher price than aluminum grade,[35] although this is not reflected in the Commission's pricing data.[36] Petitioners argue that published prices in industry publications are based on spot prices in the secondary aluminum market, and that these published prices are used by buyers and sellers in negotiations involving all grades of the silicon metal market.[37]

Conclusion. The record indicates that all domestically produced silicon metal within the scope shares the same basic physical characteristics and manufacturing process, that most

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(…Continued)
going to distributors ranged between *** percent and *** percent during the three calendar years of the POI, and was *** percent in interim 2019 and *** percent in interim 2020. CR/PR at Table II-1.

[31] Written Conference Testimony of Christopher Bowes at 3; Petitioners' Postconference Brief, Answers to Staff Questions, at 18; CR/PR at I-10 to I-11. Petitioners contend that it is a "misnomer" to speak of "grades" of silicon metal, asserting that the issue is one of different specifications rather than different "grades." Written Conference Testimony of Christopher Bowes at 3; CR/PR at I-9.

[32] Wacker's Response to Staff Questions at 5-6, 9, 13; PCC's Response to Staff Questions, Attachment B, at 1-4, 9; CR/PR at I-11.

[33] Petitions, Volume I, at 27; Petitioners' Postconference Brief, Answers to Staff Questions, at 19.

[34] Petitions, Volume I, at 28; Petitioners' Postconference Brief, Answers to Staff Questions, at 20.

[35] PCC's Response to Staff Questions, Attachment B, at 1.

[36] The pricing data show that for pricing product 1 (sales to primary aluminum producers), the weighted average f.o.b. price for U.S. producers ranged from a low of $*** per short ton contained silicon ("short ton") to a high of $*** per short ton. For pricing product 2 (sales to secondary aluminum producers), the price for U.S. producers ranged from a low of $*** per short ton to a high of $*** per short ton. For pricing product 3 (sales to chemical and polysilicon manufacturers), the price for U.S. producers ranged from a low of $*** per short ton to a high of $*** per short ton. CR/PR at V-4 and Table V-6.

[37] Written Conference Testimony of Christopher Bowes at 3.

domestically produced silicon metal is sold in the same channels of distribution, and that domestically produced silicon metal produced to the same specifications is generally interchangeable. The record in these preliminary phase investigations is limited with respect to producer and customer perceptions and price. Accordingly, based on the record, and in the absence of any argument to the contrary, we define a single domestic like product that is coextensive with Commerce's scope, consisting of silicon metal.

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."[38] 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.[39]

These investigations do not raise any related party or other domestic industry issues. No domestic producer imported or purchased subject merchandise during the POI, or is affiliated with any importer or exporter of subject merchandise.

Accordingly, we define the domestic industry to include all domestic producers of silicon metal.

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.[40]

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[38] 19 U.S.C. § 1677(4)(A).

[39] Petitioners argue that the Commission should define the domestic industry to include all domestic producers of silicon metal, namely Globe, Mississippi Silicon, and DC Alabama. Petitioners' Postconference Brief, Answers to Staff Questions, at 21. No respondent party has addressed the definition of the domestic industry.

[40] 19 U.S.C. § 1677(24)(B). In the case of countervailing duty investigations involving developing countries (as designated by the United States Trade Representative), the statute indicates that the negligibility limit is 4 percent, rather than 3 percent. 19 U.S.C. § 1677(24)(B). The instant countervailing duty investigation is with respect to imports from Kazakhstan, which is designated neither as a developing country nor a least-developed country by the United States Trade Representative for (Continued…)

For the period of June 2019 to May 2020, the most recent 12-month period preceding the filing of the petitions on June 30, 2020, subject imports from Bosnia and Herzegovina accounted for 7.3 percent of total imports by quantity, subject imports from Iceland accounted for 4.2 percent, subject imports from Kazakhstan accounted for 3.03 percent, and subject imports from Malaysia accounted for 5.8 percent.[41] Petitioners argue that the Commission should find that imports from each of the four subject countries are not negligible.[42] Based on data that TKT contends show imports from Kazakhstan at less than 3 percent of total imports for calendar year 2019, TKT asserts that imports from Kazakhstan are negligible.[43] However, TKT does not provide any authority for the Commission to deviate from the statutory requirement of determining negligibility based on the volume of imports from the most recent 12-month period preceding the June 30, 2020 filing of the petitions.[44]

Since the record evidence shows that imports from all four subject countries exceed the three percent threshold for the relevant 12-month period prior to the filing of the petitions, we find that imports from all four subject countries 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 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;

(…Continued)
purposes of the 4 percent negligibility threshold. *See Designations of Developing and Least-Developed Countries Under the Countervailing Duty Law*, 85 Fed. Reg. 7613, 7615-16 (USTR Feb. 10, 2020).

[41] CR/PR at Table IV-5. The data in Table IV-5 are based on official import statistics.

[42] Petitioners' Postconference Brief at 3-4.

[43] TKT's Written Submission at 2.

[44] *See* 19 U.S.C. § 1677(24)(A)(i).

(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.[45]

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.[46] Only a "reasonable overlap" of competition is required.[47]

A. Arguments of the Parties

Petitioners argue that the Commission should cumulate imports from all four subject countries for its analysis of reasonable indication of present material injury, contending that imports from all four subject sources compete with each other and the domestic like product in the U.S. market. They assert that the domestic product and subject imports from all sources are fungible and with the same specifications are interchangeable regardless of the source, are sold in the same geographic regions, and from all sources were present in the U.S. market in most months in 2019 and interim 2020.[48] They also contend that there is also substantial overlap between the domestic product and subject imports from all sources in channels of distribution in sales to end users, and in particular in sales to the secondary aluminum market, where subject imports are concentrated.[49]

Both Wacker and Icelandic producer PCC argue that the Commission should not cumulate subject imports. PCC states that it started selling to the U.S. market only in late 2018, and was not present in the market for most of the POI. It contends that the different grades of silicon metal sold by subject producers are not substitutable and do not compete with each other.[50] Wacker argues that subject imports from the different sources generally did not

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[45] *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).

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

[47] 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.").

[48] Petitioners' Postconference Brief, Answers to Staff Questions, at 32-37.

[49] Petitioners' Postconference Brief, Answers to Staff Questions, at 35-37.

[50] PCC's Response to Staff Questions, Attachment B, at 12-13.

compete with each other during the POI, stating that there were periods in which there was no silicon production in Iceland, Kazakhstan, and Malaysia, and imports from those sources were absent from the U.S. market during those periods. Wacker further argues that the conditions of competition between imports from the different subject sources are different, asserting that silicon metal is not a commodity product, and the silicon metal market is heavily segmented, with minimal competitive overlap between segments.[51] In addition, the Kazakhstan Ministry argues that subject imports from Kazakhstan should not be cumulated with imports from the other three subject countries, because there are differences in the conditions of competition between different subject producers, including substantial differences in market participation rates and import trends.[52]

B. Analysis

We consider subject imports from Bosnia and Herzegovina, Iceland, Kazakhstan, and Malaysia on a cumulated basis, because the statutory criteria for cumulation are satisfied. Petitioners filed the antidumping/countervailing duty petitions with respect to all four countries on the same day, June 30, 2020,[53] and as discussed below, there is a reasonable overlap of competition between and among the domestic like product and subject imports from all four subject countries.

Fungibility. Both responding U.S. producers reported that the domestic like product and subject imports from all sources are "always" interchangeable, and that subject imports from

[51] Wacker's Response to Staff Questions at 9-11.

[52] Kazakhstan Ministry's Written Submission at 5.

[53] None of the statutory exceptions to cumulation applies. We observe that subject imports from Bosnia and Herzegovina, Iceland, and Malaysia are alleged to be dumped, while subject imports from Kazakhstan are alleged to be subsidized. Wacker, PCC, and TKT argue that the Commission should not cross-cumulate allegedly subsidized subject imports from Kazakhstan with allegedly dumped imports from any of the other three subject countries. Wacker's Response to Staff Questions at 9-10; *see* PCC's Response to Staff Questions, Attachment B, at 13; TKT's Written Submission at 3. Petitioners argue that the Commission is required under U.S. law to cross-cumulate dumped and subsidized imports where the conditions for cumulation are satisfied. Petitioners' Postconference Brief, Answers to Staff Questions, at 31-32.

We continue our longstanding practice of cross-cumulating dumped and subsidized imports, pursuant to the decision of the U.S. Court of Appeals for the Federal Circuit regarding U.S. law in *Bingham & Taylor v. United States*, 815 F.2d 982 (Fed. Cir. 1987). *See Polyethylene Terephthalate (PET) Resin from Canada, China, India, and Oman,* Inv. Nos. 701-TA-531-532 and 731-TA-1270-1273 (Final), USITC Pub. 4604 at 9-11 (April 2016); *Circular Welded Carbon-Quality Steel Pipe from India, Oman, the United Arab Emirates, and Vietnam*, Inv. Nos. 701-TA-482 to 484 (Final), USITC Pub. 4362 at 12 n.59 (Dec. 2012); *Softwood Lumber from Canada*, Inv. Nos. 701-TA-414 and 731-TA-928 (Final), USITC Pub. 3509 at 29-31 (May 2009).

all sources are "always" interchangeable with each other.[54] A majority of responding U.S. importers reported that the domestic like product and subject imports from all sources are "always" interchangeable, and that subject imports from all sources are "always" or "frequently" interchangeable with each other.[55]

The Commission's pricing data reflect reported sales of pricing product 2 (sales to secondary aluminum producers) during the POI for the domestic like product and subject imports from all four sources, particularly in the second quarter of 2019 through the first quarter of 2020.[56] This indicates that the domestic like product and subject imports from all sources were competing head-to-head for sales in the U.S. market.

The vast majority of U.S. shipments of the domestic like product and subject imports from all four sources were of metallurgical grade silicon metal.[57] A smaller percentage of U.S. shipments of the domestic like product and subject imports were of high purity grade.[58]

Channels of Distribution. The majority of U.S. commercial shipments of the domestic like product were sold to polysilicon and chemical producers during the POI,[59] and an appreciable percentage of U.S. commercial shipments were sold to secondary aluminum producers throughout the POI.[60] A substantial majority of U.S. commercial shipments of subject imports from all four subject sources were sold to secondary aluminum producers during the POI.[61] Thus, the record establishes a reasonable overlap between the domestic like

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

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

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

[57] In 2019, *** percent of U.S. shipments of the domestic like product were of metallurgical grade silicon metal, while *** percent of U.S. shipments of subject imports from Bosnia and Herzegovina were of metallurgical grade, and *** percent of subject imports from Iceland, Kazakhstan, and Malaysia were of metallurgical grade. CR/PR at Table IV-5.

[58] In 2019, *** percent of U.S. shipments of the domestic like product were of high purity grade silicon metal, while *** percent of U.S. shipments of subject imports from Bosnia and Herzegovina were of metallurgical grade, and *** percent of subject imports from Iceland, Kazakhstan, and Malaysia were of high purity grade. CR/PR at Table IV-5.

[59] The percentage of U.S. commercial shipments of the domestic like product going to polysilicon and chemical producers ranged between *** percent and *** percent during the three calendar years of the POI, and was *** percent in interim 2019 and *** percent in interim 2020. CR/PR at Table II-1.

[60] The percentage of U.S. commercial shipments of the domestic like product going to secondary aluminum producers ranged between *** percent and *** percent during the three calendar years of the POI, and was *** percent in interim 2019 and *** percent in interim 2020. CR/PR at Table II-1.

[61] The percentage of U.S. commercial shipments of subject imports from Bosnia and Herzegovina going to secondary aluminum producers ranged between *** percent and *** percent during the three calendar years of the POI, and was *** in interim 2019 and *** percent in interim 2020. CR/PR at Table II-1. The percentage of U.S. commercial shipments of subject import from Iceland going to secondary aluminum producers was *** percent in 2018, *** percent in 2019, *** percent in interim 2019 and *** percent in interim 2020. *Id.* The percentage of U.S. commercial shipments of (Continued…)

product and imports from all four subject countries in shipments to secondary aluminum producer end users.

Geographic Overlap. Importers of subject merchandise from Iceland, Kazakhstan, and Malaysia all reported selling to the Northeast, Midwest, Southeast, and Central Southwest regions, while the domestic like product was sold in all regions in the United States. However, there are no data available with respect to the U.S. regions in which subject imports from Bosnia and Herzegovina were sold.[62] In 2019, official import statistics show that the vast majority of subject imports, from all four subject countries, entered the United States through customs districts in the East.[63]

Simultaneous Presence in the Market. The domestic like product was present in the U.S. market throughout the POI.[64] Subject imports from Bosnia and Herzegovina were present in 37 of the 39 months during the POI, while subject imports from Iceland were present in 30 months, subject imports from Kazakhstan were present in 28 months, and subject imports from Malaysia were present in 12 months. In 2019, subject imports from all four subject countries were present in the U.S. market.[65]

Conclusion. There is a sufficient degree of fungibility between and among subject imports from all four sources and the domestic like product for a reasonable overlap of competition, given the questionnaire data indicating interchangeability of silicon metal between and among all subject sources and the domestic like product, the pricing data indicating head-to-head competition between the domestic like product and subject imports from all four subject countries with respect to sales of pricing product 2, and the substantial overlap in sales of metallurgical grade silicon metal by domestic producers and subject imports from all subject countries. Moreover, there is a substantial overlap in channels of distribution between the domestic like product and imports from all four subject countries in shipments to

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subject imports from Kazakhstan going to secondary aluminum producers ranged between *** percent and *** percent during the three calendar years of the POI, and was *** percent in interim 2019 and *** percent in interim 2020. *Id.* The percentage of U.S. commercial shipments of subject imports from Malaysia going to secondary aluminum producers was *** percent in 2019 and *** percent in interim 2020. *Id.*

[62] CR/PR at Table II-2. The *** importer of subject merchandise from Bosnia Herzegovina reported that ***. *Id.* at note.

[63] CR/PR at Table IV-6. While, as noted above, there are no data available with respect to the U.S. regions in which subject imports from Bosnia and Herzegovina were sold, there is no information in the record to suggest that imports from Bosnia and Herzegovina were not sold in any of the four regions noted above in which imports from the three other subject sources and the domestic like product were sold, particularly given that large majorities of subject imports from all four subject countries entered the United States through customs districts in the same region. *Id.*

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

[65] CR/PR at Table IV-8.

secondary aluminum producer end users, in the geographic regions, and the simultaneous presence in the U.S. market.

We find that there is a reasonable overlap in competition between and among the domestic like product and subject imports from all four subject countries. Accordingly, we consider subject imports from Bosnia and Herzegovina, Iceland, Kazakhstan, and Malaysia 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.[66] In making this determination, the Commission must consider the volume of subject imports, their effect on prices for the domestic like product, and their impact on domestic producers of the domestic like product, but only in the context of U.S. production operations.[67] The statute defines "material injury" as "harm which is not inconsequential, immaterial, or unimportant."[68] In assessing whether there is a reasonable indication that the domestic industry is materially injured by reason of subject imports, we consider all relevant economic factors that bear on the state of the industry in the United States.[69] No single factor is dispositive, and all relevant factors are considered "within the context of the business cycle and conditions of competition that are distinctive to the affected industry."[70]

Although the statute requires the Commission to determine whether there is a reasonable indication that the domestic industry is "materially injured or threatened with material injury by reason of" unfairly traded imports,[71] it does not define the phrase "by reason of," indicating that this aspect of the injury analysis is left to the Commission's reasonable

[66] 19 U.S.C. §§ 1671b(a), 1673b(a).

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

[68] 19 U.S.C. § 1677(7)(A).

[69] 19 U.S.C. § 1677(7)(C)(iii).

[70] 19 U.S.C. § 1677(7)(C)(iii).

[71] 19 U.S.C. §§ 1671b(a), 1673b(a).

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

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

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

[73] The Federal Circuit, in addressing the causation standard of the statute, 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 further ratified in *Mittal Steel Point Lisas Ltd. v. United States*, 542 F.3d 867, 873 (Fed. Cir. 2008), where the Federal Circuit, quoting *Gerald Metals, Inc. v. United States*, 132 F.3d 716, 722 (Fed. Cir. 1997), stated that "this court requires evidence in the record 'to show that the harm occurred "by reason of" the LTFV imports, not by reason of a minimal or tangential contribution to material harm caused by LTFV goods.'" *See also Nippon Steel Corp. v. United States*, 458 F.3d 1345, 1357 (Fed. Cir. 2006); *Taiwan Semiconductor Industry Ass'n v. USITC*, 266 F.3d 1339, 1345 (Fed. Cir. 2001).

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

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

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

Assessment of whether material injury to the domestic industry is "by reason of" subject imports "does not require the Commission to address the causation issue in any particular way" as long as "the injury to the domestic industry can reasonably be attributed to the subject imports."[78] The Commission ensures that it has "evidence in the record" to "show that the harm occurred 'by reason of' the LTFV imports," and that it is "not attributing injury from other

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

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

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

[78] *Mittal Steel*, 542 F.3d at 876 &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*.

sources to the subject imports." [79] The Federal Circuit has examined and affirmed various Commission methodologies and has disavowed "rigid adherence to a specific formula."[80]

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.[81] Congress has delegated this factual finding to the Commission because of the agency's institutional expertise in resolving injury issues.[82]

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 next consider the applicability of the statutory captive production provision, given that a substantial percentage of the quantity of U.S. producers' total shipments of the domestic like product during the POI was reported as transfers to related firms.[83] [84] [85]

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[79] *Mittal Steel*, 542 F.3d at 873 (quoting from *Gerald Metals*, 132 F.3d at 722), 877-79. We note that one relevant "other factor" may involve the presence of significant volumes of price-competitive nonsubject imports in the U.S. market, particularly when a commodity product is at issue. In appropriate cases, the Commission collects information regarding nonsubject imports and producers in nonsubject countries in order to conduct its analysis.

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

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

[82] *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.").

[83] The percentage of total U.S. shipments of the domestic like product reported as transfers to related firms was *** percent in 2017; *** percent in 2018, and *** percent in 2019; it was *** percent in interim 2018 and *** percent in interim 2019. CR/PR at Table III-6. There were *** shipments reported as internal consumption by the domestic industry, and export shipments accounted for a *** percentage of the quantity of total shipments, ranging from *** percent to *** percent during the POI. *Id.* Companies reporting internal transfers were ***. CR/PR at VI-10 and n.9; *** U.S. Producer Questionnaire Response at Question II-7, II-11 (EDIS Document No. 714686).

[84] 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-
(Continued…)

The threshold criterion in the statute is that "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."[86] The *** of U.S. producers' total shipments of the domestic like product during the POI were commercial U.S. shipments.[87] Thus, the record indicates that domestic producers sell "significant" production of the domestic like product in the merchant market. A substantial percentage of the quantity of U.S. producers' total shipments of the domestic like product during the POI was reported as transfers to related firms.[88]

However, we find that the second statutory criterion of the captive production provision is not satisfied.[89] The available information indicates that silicon metal generally

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> (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.

[85] Petitioners summarized the Commission's finding in its 2018 silicon metal investigations that the captive production provision did not apply in those investigations, but did not otherwise present an argument as to its applicability in these investigations. Petitioners' Postconference Brief, Response to Staff Questions, at 51-52; *see Silicon Metal from Australia, Brazil, Kazakhstan, and Norway*, Inv. Nos. 701-TA-567 to 569 and 731-TA-1343-1345 (Final), USITC Pub. 4773 at 19 n.102 (Apr. 2018). No respondent party addressed the issue of captive production.

[86] 19 U.S.C. § 1677(7)(C)(iv).

[87] The percentage of U.S. producers' total shipments of the domestic like product by quantity during the POI that were commercial U.S. shipments was *** percent in 2017, *** percent in 2018, and *** percent in 2019; it was *** percent in interim 2019 and *** percent in interim 2020. CR/PR at Table III-6.

[88] The percentage of total U.S. shipments of the domestic like product reported as transfers to related firms was *** percent in 2017; *** percent in 2018, and *** percent in 2019; it was *** percent in interim 2018 and *** percent in interim 2019. CR/PR at Table III-6. There were *** shipments reported as internal consumption by the domestic industry, and export shipments accounted for a *** percentage of the quantity of total shipments, ranging from *** percent to *** percent during the POI. *Id.*

[89] In applying the second statutory criterion, we generally consider whether the domestic like product is the predominant material input into a downstream product by referring to its share of the raw material cost of the downstream product. *See generally, e.g., Polyethylene Terephthalate Film, Sheet and Strip from Brazil, China, Thailand, and the United Arab Emirates,* Inv. Nos. 731-TA-1131-1134 (Final), USITC Pub. 4040 (October 2008) at 17 n.103; *Polyethylene Terephthalate Film, Sheet, and Strip*
(Continued…)

accounts for a small share of the cost of the downstream products in which it is used. The cost share for silicon metal in the production of aluminum was estimated to be 10 percent, for aluminum alloys it ranged from 7 to 88 percent, for chlorosilane from 8 to 22 percent, and for other applications from 5 to 40 percent.[90] Thus, the current record does not contain sufficient information to support a conclusion that silicon metal is the "predominant" material input in the downstream products in which it is used. Additionally, we are unable to determine whether the first statutory criterion is satisfied for either the transfers by *** or the transfers by ***.[91] Accordingly, we find, for purposes of these preliminary phase investigations, that the second statutory criterion is not satisfied.[92]

We therefore find that the captive production provision does not apply for purposes of these preliminary phase investigations.[93]

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. Chemical producers, primary aluminum producers, and secondary aluminum producers are the principal end users of silicon metal. Silicon metal is used in a variety of

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from India and Taiwan, Inv. Nos. 701-TA-415 and 731-TA-933-34 (Final), USITC Pub. 3518 (June 2002) at 11 & n.51. The Commission has construed "predominant" material input to mean the main or strongest element, and not necessarily a majority, of the inputs by value. *See Polyvinyl Alcohol from Germany and Japan,* Inv. Nos. 731-TA-1015-16 (Final), USITC Pub. 3604 (June 2003) at 15 n.69.

[90] CR/PR at II-7.

[91] The first criterion focuses on whether any of the domestic like product that is transferred internally for further processing is in fact sold on the merchant market. *See*, *e.g*., *Hot-Rolled Steel Products from Argentina and South Africa*, Inv. Nos. 701-TA-404, 731-TA-898, 905 (Final), USITC Pub. 3446 at 15-16 (Aug. 2001); *Certain Cold-Rolled Steel Products from Argentina, Brazil*, *China*, *Indonesia*, *Japan*, *Russia*, *Slovakia*, *South Africa*, *Taiwan*, *Turkey and Venezuela*, Inv. Nos. 701-TA-393 and 731-TA-829-40 (Final) (Remand), USITC Pub. 3691 at 2 & n.19 (May 2004). The record is incomplete as to whether the silicon metal that is internally transferred to *** for processing into downstream articles does or does not enter the merchant market for the domestic like product, and we are accordingly unable to determine whether the first statutory criterion is satisfied for either the transfers by *** or the transfers by ***.

[92] We observe that in the Commission's final determination in its 2018 investigations of silicon metal from four countries, it found the record did not contain sufficient information to support a conclusion that silicon metal is the predominant material input in the downstream products in which it is used, and thus found that the second statutory criterion was not met. *See Silicon Metal from Australia, Brazil, Kazakhstan, and Norway*, Inv. Nos. 701-TA-567 to 569 and 731-TA-1343-1345 (Final), USITC Pub. 4773 at 19 n.102 (Apr. 2018).

[93] In any final phase of these investigations, we intend to seek additional information from the parties regarding these reported internal transfers and the possible applicability of the captive production provision.

applications, which include aluminum (automobiles/commercial), chemicals (silicones), and polysilicon (solar and electronics).[94]

A majority of U.S. producers and a plurality of responding importers reported that U.S. demand for silicon metal decreased during the POI.[95] Petitioners and respondent PCC both stated that the COVID-19 pandemic has had a negative effect on demand for silicon metal in 2020.[96]

Apparent U.S. consumption declined by 16.3 percent between 2017 and 2019, declining from 360,492 short tons in 2017 to 318,113 short tons in 2018 and 301,739 short tons in 2019.[97]

3. Supply Conditions

The domestic industry had the largest share of the U.S. market throughout the POI, followed by nonsubject imports, and then subject imports.

There are three producers in the domestic industry: Globe, accounting for *** percent of domestic production in 2019; DC Alabama, accounting for *** percent; and Mississippi Silicon, accounting for *** percent.[98] Mississippi Silicon is the newest of the three domestic producers, with construction of its plant in Burnsville, Mississippi started in 2014, production commenced in September 2015, and established production and capacity levels reached in 2017.[99]

Globe idled its Selma, Alabama plant in *** 2018 and its Niagara Falls, New York plant in *** 2018.[100] It *** its Beverly, Ohio plant ***.[101] Mississippi Silicon idled one of its furnaces at its Burnsville, Mississippi plant for most of the fourth quarter of 2019; it restarted that furnace, but has been operating its plant at reduced capacity in 2020 ***.[102]

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[94] CR/PR at I-3, I-8 to I-9; II-1, II-7.

[95] CR/PR at Table II-4.

[96] Petitioners' Postconference Brief, Response to Staff Questions, at 30-31; PCC's Response to Staff Questions, Attachment B, at 11-12. The two Wacker conference witnesses both state that notwithstanding the temporary disruption caused by COVID-19, the long-term outlook for U.S. demand for silicon metal is positive. Written conference testimony of Martina Schulze-Adams at Paragraphs 20-22; written conference testimony of Mary Beth Hudson at Paragraphs 5, 20.

[97] CR/PR at IV-18 and Table IV-9. Apparent U.S. consumption was 88,136 short tons in interim 2019 and 14.9 percent lower, at 74,994 short tons, in interim 2020. *Id.*

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

[99] Written conference testimony of Braulio M. Lage at 2.

[100] Written conference testimony of Christopher Bowes at 5; CR/PR at Table III-3.

[101] CR/PR at Table III-3. As a result of these developments, ***. CR/PR at Table VI-1 n.3.

[102] Written conference testimony of Braulio M. Lage at 4; CR/PR at Table III-3.

The capacity of the domestic industry decreased by *** percent between 2017 and 2019, primarily as a result of ***.[103] The industry's capacity declined from *** short tons in 2017 to *** short tons in 2018 and *** short tons in 2019.[104] The industry's capacity was below apparent U.S. consumption throughout the POI. The domestic industry's share of apparent U.S. consumption increased from 52.4 percent in 2017 to 58.3 percent in 2018, and then fell to 48.3 percent in 2019.[105]

Cumulated subject imports' share of apparent U.S. consumption declined from *** percent in 2017 to *** percent in 2018, and then rose to *** percent in 2019.[106]

Nonsubject imports' share of apparent U.S. consumption declined from *** percent in 2017 to *** percent in 2018, and then increased to *** percent in 2019.[107] The largest sources of nonsubject imports during the POI were Brazil, Canada, and Norway.[108]

There were outstanding antidumping duty orders on imports of silicon metal from China and Russia throughout the POI; the order on imports from China was continued in June 2018, and the order on imports from Russia was continued in 2020.[109] [110]

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[103] CR/PR at Table III-4; *see* Petitioners' Postconference Brief at 9.

[104] CR/PR at Table III-4, C-1. Capacity was 40,598 short tons in interim 2019 and higher, at 46,413 short tons, in interim 2020. *Id.*

[105] CR/PR at Tables IV-10, C-1. The domestic industry's share of apparent U.S. consumption was 48.5 percent in interim 2019 and higher, at 58.3 percent, in interim 2020. *Id.*

[106] CR/PR at Tables IV-10, C-1. Cumulated subject imports' share of apparent U.S. consumption was 8.4 percent in interim 2019 and higher, at 8.8 percent, in interim 2020. *Id.* Kazakh producer TKT reported that it suspended operations at its production plant by idling two furnaces as of January 1, 2020. TKT's Written Submission at 1; CR/PR at II-6; Table VII-10. Icelandic producer PCC publicly announced that it would be temporarily stopping production at its facility at the end of July 2020. *See* PCC's Response to Staff Questions, Attachment B, at 16-18; CR/PR at Table VII-5.

[107] CR/PR at Tables IV-10, C-1. Nonsubject imports' share of apparent U.S. consumption was *** percent in interim 2019 and lower, at *** percent, in interim 2020. *Id.*

[108] CR/PR at II-6. In December 2015, Globe Specialty Metals, Inc. merged with Grupo FerroAtlántica to form Ferroglobe PLC, Globe's parent company. CR/PR at VI-1 n.2. Ferroglobe has affiliated nonsubject producers in Canada, France, South Africa, and Spain. CR/PR at Table III-2; written conference testimony of Martina Schulze-Adams at Paragraphs 14-15.

[109] CR/PR at Table I-1.

[110] The Commission conducted antidumping and countervailing duty investigations with respect to imports from Australia and Brazil, an antidumping duty investigation with respect to imports from Norway, and a countervailing duty investigation with respect to imports from Kazakhstan, and issued negative final determinations with respect to imports from all four countries. *Silicon Metal from Australia, Brazil, Kazakhstan, and Norway*, Inv. Nos. 701-TA-567 to 569 and 731-TA-1343-1345 (Final), USITC Pub. 4773 (Apr. 2018). Conference testimony by witnesses for both petitioners and respondents indicated that developments in those investigations affected silicon metal prices in the U.S. market in 2017 and 2018. Written conference testimony of Braulio M. Lage at 3; written conference testimony of Christopher Bowes at 5; written conference testimony of Mary Beth Hudson at Paragraph 17.

4. Substitutability and Other Conditions

We find that that there is a high degree of substitutability between domestically produced silicon metal and cumulated subject imports. However, the extent to which subject imports are more typically sold to secondary aluminum producers, whereas the domestic like product is primarily sold to chemical and polysilicon producers, may affect the substitutability of subject imports and the domestic like product.[111] Nonetheless, as previously discussed in section VI.B, both reporting U.S. producers and a majority of responding importers reported that the domestic like product and subject imports from all sources are "always" interchangeable.[112]

Thirteen of the 14 purchasers responding to the Commission's lost sales/lost revenue survey listed price or cost as one of their top three factors in purchasing decisions. Most purchasers (9 of 14) listed quality as the most important factor, and 12 purchasers listed quality as one of the top three factors. Availability/supply/delivery was also listed as one of the top factors by 11 of the 14 responding purchasers. Payment terms, service, availability in bulk versus bags, and having multiple sources were also listed as among the top three factors by at least one purchaser.[113] Both responding U.S. producers reported that nonprice differences are "never" significant in any comparisons of subject imports and the domestic like product, while majorities of responding importers reported that nonprice differences are "sometimes" or "never" significant.[114] Accordingly, we find that price is one of the important factors in purchasing decisions for silicon metal.

Silicon metal is produced from mined quartzite and consists almost entirely of elemental silicon with very small amounts of impurities (such as iron, calcium, and aluminum). U.S. producers reported that raw materials as a share of cost of goods sold decreased, from *** percent in 2017 to *** percent in 2019.[115]

U.S. producers and importers reported selling most of their silicon metal under annual contracts.[116] Published price indices based on spot sales in the secondary aluminum market are readily available to purchasers, and form part of contract negotiations with suppliers including for contracts for other grades of silicon metal.[117] All U.S. producer and most importer contracts

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[111] CR/PR at II-8 and Table II-1.

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

[113] CR/PR at II-9.

[114] CR/PR at Table II-6.

[115] CR/PR at V-1. During January-March 2020, raw materials accounted for *** percent of the cost of goods sold. *Id.*

[116] CR/PR at V-3, Table V-2.

[117] CR/PR at V-2 to V-3, Figure V-2. According to conference testimony of petitioners' witnesses, publications such as CRU's *Monitor* and Platts' *Metal Week* publish information regarding silicon metal prices based on spot sales in the secondary aluminum market, which is used to set prices throughout the (Continued…)

are reported to be indexed to the published price of silicon metal.[118] There are no published price series data for chemical or polysilicon grade silicon metal, but purchasers in all parts of the U.S. market reference published indices based on sales to the aluminum purchasers.[119] According to petitioners, most silicon metal contracts are negotiated or competitively bid during the fourth quarter of the calendar year, locking in prices for shipments during the following year.[120]

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."[121]

The volume of cumulated subject imports increased by 55.8 percent between 2017 and 2019, falling from 19,199 short tons in 2017 to 13,654 short tons in 2018, and then rising to 29,857 short tons in 2019; it was 7,413 short tons in interim 2019 and lower, at 6,586 short tons, in interim 2020.[122]

Cumulated subject imports' share of apparent U.S. consumption fell from 5.3 percent in 2017 to 4.3 percent in 2018, and then rose to 9.9 percent in 2019; it was 8.4 percent in interim 2019 and higher, at 8.8 percent, in interim 2020.[123] Cumulated subject imports gained 4.6 percentage points of market share between 2017 and 2019.[124]

We find that the volume of cumulated subject imports, and the increase in that volume, are significant in absolute terms and relative to consumption in the United States.

(…Continued)
market. Written conference testimony of Christopher Bowes at 3; written conference testimony of Braulio M. Lage at 4. Respondent Wacker agrees that market data supplied by industry analyst publications such as CRU are essential to assessing U.S. silicon metal prices and market conditions. Wacker's Response to Staff Questions at 12.

[118] CR/PR at V-3; *see* written conference testimony of Christopher Bowes at 3.

[119] CR/PR at V-3; written conference testimony of Christopher Bowes at 3; written conference testimony of Braulio M. Lage at 4.

[120] Written conference testimony of Christopher Bowes at 4; Petitioners' Postconference Brief at 27-28.

[121] 19 U.S.C. § 1677(7)(C)(i).

[122] CR/PR at IV-3, Table IV-2.

[123] CR/PR at Tables IV-10, C-1.

[124] The domestic industry's market share declined from 52.4 percent in 2017 to 48.3 percent in 2019. CR/PR at Tables IV-10, C-1. Subject imports as a percentage of domestic production were *** percent in 2017, *** percent in 2018, and *** percent in 2019; the percentage was *** percent in interim 2019 and *** percent in interim 2020. CR/PR at Table IV-2.

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.[125]

As discussed in section VII.B.3, the record indicates that subject imports and the domestic like product are highly substitutable, and the price is an important factor in purchasing decisions for silicon metal.

The Commission requested U.S. producers and importers to provide quarterly data for the total quantity and f.o.b. value of three silicon metal products shipped to unrelated U.S. customers during January 2017 through March 2020.[126] All three U.S. producers and five importers provided usable pricing data for sales of the requested products, although not all firms reported pricing data for all products for all quarters.[127] Pricing data reported by these firms accounted for approximately 88 percent of U.S. producers' U.S. commercial shipments of silicon metal in 2019, *** percent of U.S. shipments of subject imports from Bosnia and Herzegovina, *** percent of U.S. shipments of subject imports from Iceland, *** percent of U.S. shipments of subject imports from Kazakhstan, and *** percent of U.S. shipments of subject imports from Malaysia in 2019.[128] Nearly all pricing data reported by importers of subject merchandise were for pricing product 2, product sold to secondary aluminum producers. Data for pricing product 1, product sold to primary aluminum producers, were only reported in two quarters for subject imports from one country, Kazakhstan.[129]

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[125] 19 U.S.C. § 1677(7)(C)(ii).

[126] CR/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 .4% calcium, and no restriction of the aluminum content.

Product 3.-- Sold to chemical and/or polysilicon 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.*

[127] CR/PR at V-4.

[128] CR/PR at V-4.

[129] CR/PR at V-4.

The pricing data show that cumulated subject imports were priced below domestically produced product in 21 of 38 quarterly comparisons, with margins of underselling ranging from *** percent to *** percent, with an average margin of underselling of *** percent.[130] The data also reflect underselling by volume, with *** short tons associated with instances of underselling, as compared to *** short tons of cumulated subject imports associated with instances of overselling.[131] Thus, *** percent of the quantity 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. The pricing data show underselling by subject imports in a slight majority of quarterly comparisons and by quantity.

Of the 13 purchasers responding to the Commission's lost sales/lost revenue survey, 11 reported that they had purchased subject imports instead of U.S.-produced product during the POI. Eight of these purchasers reported that not only were subject import prices lower than those of U.S.-produced product, but that price was a primary reason for the decision to purchase subject imports rather than U.S.-produced product. These eight purchasers reported purchasing a quantity of 14,170 short tons of subject imports rather than the domestic like product.[132] Given the high degree of substitutability between subject imports and the domestic like product, the importance of price in purchasing decisions for silicon metal, the majority of underselling in price comparisons data, and the confirmed lost sales, we find the underselling by cumulated subject imports to be significant. Further, as cumulated subject imports undersold the domestic like product to this significant degree, cumulated subject imports gained *** percentage points of market share between 2017 and 2019 at the expense of the domestic industry, which lost *** percentage points of market share.[133]

We also examined the available evidence on price trends. U.S. producers' prices for pricing product 2 (sales to secondary aluminum producers), the pricing product where domestic producers faced direct competition from subject producers throughout the POI, declined by *** percent over the POI.[134] Moreover, the decline in U.S. producers' prices was particularly steep in 2019, during a year in which the volume of cumulated subject imports more than

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[130] CR/PR at Table V-7. We note that for the 17 quarterly comparisons in which cumulated subject imports were priced above domestically priced product, the average margin of overselling was *** percent, less than the average margin of underselling of *** percent. *Id.*

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

[132] CR/PR at V-17, Tables V-11 to V-I2. We note that the quantity of subject imports with respect to these confirmed lost sales by the eight purchasers accounted for 20.4 percent of the total quantity of cumulated subject imports during the POI (69,263 short tons). Derived from CR/PR at Table IV-2.

[133] The domestic industry's market share declined from 52.4 percent in 2017 to 48.3 percent in 2019, while the market share of subject imports increased from 5.3 percent in 2017 to 9.9 percent in 2019. CR/PR at Tables IV-10, C-1.

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

doubled their 2018 volume.[135] As cumulated subject import volumes increased by 118.7 percent between 2018 and 2019, subject import prices for pricing product 2 substantially declined; declines between the fourth quarter of 2018 and the fourth quarter of 2019 for pricing product 2 were *** percent for subject imports from Bosnia and Herzegovina, *** percent for subject imports from Iceland, and *** percent for subject imports from Kazakhstan.[136] As subject import volumes increased and subject import prices declined in 2019, U.S. producers' prices for pricing product 2 likewise fell from $*** per short ton in the fourth quarter of 2018 to $*** per short ton in the fourth quarter of 2019, a decline of *** percent.[137]

As previously discussed in section VII.B.4, industry publications' published price indices reporting sales prices for silicon metal in the secondary aluminum market are widely used by purchasers in the United States by reference for all grades of silicon metal, including in the primary aluminum market and the chemical and polysilicon markets.[138] The record indicates that between the fourth quarter of 2018 and the fourth quarter of 2019, U.S. producers' prices for pricing product 1 (sales to primary aluminum producers) declined by *** percent,[139] while U.S. producers' prices for pricing product 3 (sales to chemical and polysilicon manufacturers) declined by *** percent.[140]

Thus, the record indicates that from 2018 to 2019, as cumulated subject imports more than doubled in volume and their prices declined, the domestic industry's prices in sales to secondary aluminum producers declined by *** percent.[141] Given the reliance by silicon metal purchasers on published prices in the secondary aluminum sector for all grades of silicon metal, the domestic industry experienced corresponding declines in 2019 in its prices in sales to primary aluminum producers and to chemical and polysilicon manufacturers.[142] Thus, we find

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[135] The volume of cumulated subject imports increased from 13,654 short tons in 2018 to 29,857 short tons in 2019, an increase of 118.7 percent. Derived from CR/PR at Table IV-2.

[136] Derived from CR/PR at Table V-4. There were *** pricing data for pricing product 2 for subject imports from Malaysia ***, but the price of subject imports of pricing product 2 from Malaysia declined by *** percent between the second quarter of 2019 and the fourth quarter of 2019. *Id.*

[137] Derived from CR/PR at Table V-4.

[138] CR/PR at V-2; written conference testimony of Christopher Bowes at 3. The available information in the record indicates that one such published price index showed U.S. silicon metal prices declining during 2019. Derived from CR/PR at Table V-4.

[139] Derived from CR/PR at Table V-3. By contrast, domestic producers' prices for pricing product 1 (sales to primary aluminum producers) increased by *** percent over the POI, while domestic producers' prices for pricing product 3 (sales to chemical and polysilicon manufacturers) increased by *** percent. *Id*. at Table V-6.

[140] Derived from CR/PR at Table V-5.

[141] Derived from CR/PR at Table V-4.

[142] *See* CR/PR at Tables V-3, V-5.

that increasing volumes of cumulated subject imports depressed the prices of the domestic industry to a significant degree.[143]

The domestic industry's ratio of cost of goods sold ("COGS") to net sales fell from 98.1 percent in 2017 to 90.4 percent in 2018, and then increased to 116.0 percent in 2019.[144] Between 2017 and 2019, the domestic industry's net sales average unit value (in dollars per short ton) increased by $124, from $2,255 in 2017 to $2,379 in 2019, while its average unit cost (in dollars per short ton) increased by $548, from $2,212 in 2017 to $2,760 in 2019.[145] As the domestic industry's average unit cost increased by more than its net sales AUV, the industry experienced not only a cost-price squeeze, but a gross per short ton unit loss of $380 in 2019.[146]

We consequently find that cumulated subject imports prevented price increases by the domestic industry, which otherwise would have occurred, to a significant degree.

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

E. Impact of the Subject Imports[147]

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.

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[143] We note that in response to the Commission's lost sales/lost revenue survey, three purchasers reported that domestic producers reduced their prices to compete with lower-priced subject imports, with estimates of the price reductions at two percent. CR/PR at V-19, Tables V-13 to V-14.

[144] CR/PR at Tables VI-1, C-1. The ratio of COGS to net sales was 96.7 percent in interim 2019 and higher, at 97.5 percent, in interim 2020. *Id.*

[145] The domestic industry's net sales AUV (in dollars per short ton) was $2,255 in 2017, $2,639 in 2018, $2,379 in 2019; it was $2,466 in interim 2019 and lower, at $2,280, in interim 2020. CR/PR at Table VI-1. The domestic industry's unit cost (in dollars per short ton) increased from $2,212 in 2017 to $2,385 in 2018 and $2,760 in 2019; it was $2,384 in interim 2019, and lower, at $2,221, in interim 2020. *Id.*

[146] CR/PR at Table VI-1. Given the limited information regarding the domestic industry's raw material costs in the record of these preliminary phase investigations, we intend to collect additional information in any final phase of these investigations.

[147] In its notice initiating the antidumping duty investigations, Commerce reported estimated dumping margins of 21.41 percent for imports from Bosnia and Herzegovina, 28.12 to 47.54 percent for imports from Iceland, and 11.49 to 16.92 percent for imports from Malaysia. *Silicon Metal from Bosnia and Herzegovina, Iceland, and Malaysia: Initiation of Less-Than-Fair-Value Investigations,* 85 Fed. Reg. 45177, 45179 (July 27, 2020).

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."[148]

The domestic industry's performance indicators generally declined between 2017 and 2019. While some indicators improved between 2017 and 2018, almost all of them sharply declined between 2018 and 2019, including capacity, production, U.S. shipments, market share, net sales value, employment indicators, and capital investments. The domestic industry's financial condition was relatively weak in 2017, sustaining operating and net losses, improved in 2018, and then sharply declined in 2019, sustaining substantial gross, operating, and net losses.

The domestic industry's capacity decreased by *** percent between 2017 and 2019, declining from *** short tons in 2017 to *** short tons in 2018 and *** short tons in 2019.[149] Production decreased by *** percent from 2017 to 2019, declining from *** short tons in 2017 to *** short tons in 2018 and *** short tons in 2019.[150] Capacity utilization declined from *** percent in 2017 to *** percent in 2018 and *** percent in 2019.[151]

U.S. shipments declined by 22.9 percent from 2017 to 2019, falling from 188,981 short tons in 2017 to 185,493 short tons in 2018 and 145,692 short tons in 2019.[152] The domestic industry's share of apparent U.S. consumption increased from 52.4 percent in 2017 to 58.3 percent in 2018, and then fell to 48.3 percent in 2019.[153] Ending inventories declined by *** percent from 2017 to 2019, increasing from *** short tons in 2017 to *** short tons in 2018, and *** short tons in 2019.[154]

Employment indicators declined between 2017 and 2019. Employment (measured in production-related workers ("PRWs")) declined by 16.6 percent between 2017 and 2019, increasing from 664 PRWs in 2017 to 739 PRWs in 2018, and then declining to 554 PRWs in 2019.[155] Hours worked declined by 17.6 percent from 2017 to 2019, increasing from 1.4 million

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[148] 19 U.S.C. § 1677(7)(C)(iii). This provision was amended by the Trade Preferences Extension Act of 2015, Pub. L. 114-27.

[149] CR/PR at Tables III-4, C-1. Capacity was *** short tons in interim 2019 and higher, at *** short tons, in interim 2020. *Id.*

[150] CR/PR at Tables III-4, C-1. Production was *** short tons in interim 2019 and higher, at *** short tons, in interim 2020. *Id.*

[151] CR/PR at Tables III-4, C-1. Capacity utilization was *** percent in interim 2019 and lower, at *** percent, in interim 2020. *Id.*

[152] CR/PR at Tables III-6, C-1. U.S. shipments were 42,786 short tons in interim 2019 and higher, at 43,737 short tons, in interim 2020. *Id.*

[153] CR/PR at Tables IV-10, C-1. The domestic industry's share of apparent U.S. consumption was 48.5 percent in interim 2019 and higher, at 58.3 percent, in interim 2020. *Id.*

[154] CR/PR at Tables III-7, C-1. Ending inventories were *** short tons in interim 2019 and lower, at *** short tons, in interim 2020. *Id.*

[155] CR/PR at Tables III-9, C-1. Employment was 549 PRWs in interim 2019 and higher, at 591 PRWs, in interim 2020. *Id.*

hours in 2017 to 1.6 million hours in 2018, and then declining to 1.2 million hours in 2019.[156] Wages paid declined by 15.6 percent from 2017 to 2019, increasing from $41.0 million in 2017 to $46.2 million in 2018, and then declining to $34.6 million in 2019.[157] Productivity declined by 12.7 percent from 2017 to 2019, falling (in short tons per 1,000 hours) from 134.0 in 2017 to 115.2 in 2018, and then increasing to 116.9 2019.[158]

Net sales value declined by 18.6 percent from 2017 to 2019, increasing from $426.3 million in 2017 to $489.7 million in 2018, and then falling to $346.9 million in 2019.[159] The industry's total COGS declined by 3.8 percent from 2017 to 2019, increasing from $418.2 million in 2017 to $442.7 million in 2018, and then falling to $402.3 million in 2019.[160] The industry's ratio of COGS to net sales fell from 98.1 percent in 2017 to 90.4 percent in 2018, and then increased to 116.0 percent in 2019.[161] Gross profit increased from $8.1 million in 2017 to $47.0 million in 2018, and then the industry has a gross loss of $55.5 million in 2019.[162]

The industry had an operating loss of $17.1 million in 2017, then operating income of $17.1 million in 2018, followed by an operating loss of $77.5 million in 2019.[163] The industry's operating income margin was negative 4.0 percent in 2017, positive 3.5 percent in 2018, and negative 22.3 percent in 2019.[164] The industry had a net loss of $23.7 million in 2017, then net income of $10.2 million in 2018, followed by a net loss of $85.7 million in 2019.[165] The industry's net income margin was negative 5.6 percent in 2017, positive 2.1 percent in 2018, and negative 24.7 percent in 2019.[166] Capital expenditures declined by *** percent between

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[156] CR/PR at Tables III-9, C-1. Hours worked were 295,000 hours in interim 2019 and higher, at 323,000 hours, in interim 2020. *Id.*

[157] CR/PR at Tables III-9, C-1. Wages paid were $8.4 million in interim 2019 and higher, at $9.1 million, in interim 2020. *Id.*

[158] CR/PR at Tables III-9, C-1. Productivity (in short tons per 1,000 hours) was 127.3 in interim 2019 and higher, at 129.9, in interim 2020. *Id.*

[159] CR/PR at Tables VI-1, C-1. Net sales value was $105.6 million in interim 2019 and lower, at $99.7 million, in interim 2020. *Id.*

[160] CR/PR at Tables VI-1, C-1. Total COGS was $102.1 million in interim 2019 and lower, at $97.2 million, in interim 2020. *Id.*

[161] CR/PR at Tables VI-1, C-1. The ratio of COGS to net sales was 96.7 percent in interim 2019 and higher, at 97.5 percent, in interim 2020. *Id.*

[162] CR/PR at Tables VI-1, C-1. Gross profit was $3.5 million in interim 2019 and lower, at $2.5 million, in interim 2020. *Id.*

[163] CR/PR at Tables VI-1, C-1. The industry had operating losses of $1.8 million in interim 2019 and $2.7 million in interim 2020. *Id.*

[164] CR/PR at Tables VI-1, C-1. The industry's operating margin was negative 1.7 percent in interim 2019 and negative 2.8 percent in interim 2020. *Id.*

[165] CR/PR at Tables VI-1, C-1. The industry had net losses of $4.0 million in interim 2019 and $5.5 million in interim 2020. *Id.*

[166] CR/PR at Tables VI-1, C-1. The industry's net income margin was negative 3.8 percent in interim 2019 and negative 5.5 percent in interim 2020. *Id.*

2017 and 2019, increasing from $*** in 2017 to $*** in 2018, and then falling to $*** in 2019.[167]

The sharp decline in the domestic industry's performance over the POI, and in particular between 2018 and 2019, occurred as low-priced subject imports increased in volume, took market share from the domestic industry through underselling, and depressed and suppressed domestic producers' prices. Because of the market share lost by the domestic industry to the increasing volume of low-priced subject imports that significantly undersold the domestic like product, the industry's production, U.S. shipments, and sales were lower than they would otherwise have been, and because of the significant depression and suppression of domestic producers' prices by low-priced subject imports, the industry's revenues were lower than they otherwise would have been. These declines in the domestic industry's sales and its revenues as a result of low-priced subject imports led to a sharp decline in the domestic industry's financial performance, which was relatively weak at the beginning of the POI in 2017, but was much weaker in 2019, with substantial gross, operating, and net losses.

The domestic industry's performance declined dramatically between 2018 and 2019, as its net sales AUV declined by $260 per short ton and its average unit cost increased by $275 per short ton,[168] at a time when the volume of subject imports more than doubled.[169] While we note that U.S. demand declined over the POI, we find that declining demand does not explain the large increase in the domestic industry's COGS to net sales ratio over the POI. The *** decline in apparent U.S. consumption of *** percent occurred between 2017 and 2018, a period in which the industry's COGS to net sales ratio declined by 7.7 percentage points, while the *** decline in apparent U.S. consumption of *** percent occurred between 2018 and 2019, a period in which the industry's COGS to net sales ratio increased by 25.6 percentage points.[170] We recognize that domestic producer DC Alabama reported ***.[171] However, if that amount were subtracted from the domestic industry's COGS in 2019, the domestic industry's COGS to net sales ratio in 2019 would still have exceeded *** percent, and would still have reflected an

[167] CR/PR at Tables VI-6, C-1. Capital expenditures were $*** in interim 2019 and higher, at $*** in interim 2020. *Id.* The domestic industry incurred research and development ("R&D") expenses of $*** in 2017, 2018, and 2019. R&D expenses were $*** in interim 2019 and interim 2020. CR/PR at Table VI-6.

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

[169] Derived from CR/PR at Table IV-2.

[170] CR/PR at Table C-1. By contrast, the volume of subject imports declined by 28.8 percent between 2017 and 2018, when the industry's COGS to net sales ratio declined, but increased by 118.7 percent between 2018 and 2019, when the industry's COGS to net sales ratio dramatically increased. Derived from CR/PR at Table IV-2.

[171] CR/PR at VI-13 and n.18; Petitioners' Postconference Brief at 30.

increase in the ratio over the levels in 2017 and 2018.[172] Thus, we find that this *** does not fully explain the large increase in the domestic industry's COGS to net sales ratio over the POI and its cost-price squeeze. In any final phase of these investigations, we will examine further this development and its effect on the domestic industry's performance, as well as other respects in which DC Alabama's performance may have differed substantially from that of petitioners Globe and Mississippi Silicon.

In our analysis of the impact of cumulated subject imports on the domestic industry, we have taken into account whether there are other factors that may have had an adverse impact on the industry during the POI to ensure that we are not attributing injury from other factors to cumulated subject imports. In this respect, we have examined the role of nonsubject imports, which had a substantial presence in the U.S. market throughout the POI. However, the volume and market share of nonsubject imports declined between 2017 and 2019, while the volume and market share of subject imports increased.[173] Thus, the domestic industry's loss of 4.1 percentage points of market share between 2017 and 2019 was attributable to subject imports, which gained 4.6 percentage points of market share, and was not attributable to nonsubject imports, which lost 0.5 percentage points of market share.[174] Moreover, we note that the AUVs for nonsubject imports were well above the AUVs for subject imports throughout the POI.[175]

We have also considered the decline in U.S. demand during the POI, as reflected in the 16.3 percent decline in apparent U.S. consumption between 2017 and 2019.[176] However, the decline in apparent U.S. consumption does not explain the domestic industry's loss of market

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[172] If the $*** were subtracted from the domestic industry's total COGS in 2019 of $402,344,000, this would have left COGS at $***, which was higher than the domestic industry's net sales in 2019 of $346,879,000, yielding a revised COGS to net sales ratio for 2019 of *** percent. Derived from CR/PR at Table VI-1.

[173] The volume of nonsubject imports declined from 152,344 short tons in 2017 to 126,190 short tons in 2019, while the volume of subject imports increased from 19,166 short tons in 2017 to 29,857 short tons in 2019. CR/PR at Table IV-2. The market share of nonsubject imports declined from 42.3 percent in 2017 to 41.8 percent in 2019, while the market share of subject imports increased from 5.3 percent in 2017 to 9.9 percent in 2019. CR/PR at Tables IV-10, C-1.

[174] CR/PR at Tables IV-10, C-1.

[175] The AUVs for nonsubject imports (in dollars per short ton) were $2,204 in 2017, $2,651 in 2018, and $2,390 in 2019; they were $2,487 in interim 2019 and $2,126 in interim 2020. By contrast, the AUVs for subject imports were $1,824 in 2017, $2,203 in 2018, and $1,794 in 2019; they were $1,945 in interim 2019 and $1,508 in interim 2020. Tables IV-2, C-1. However, these differences may to some extent reflect differences in product mix, given that a *** of U.S. importers' U.S. commercial shipments of nonsubject imports went to chemical and polysilicon producers, while a substantial majority of U.S. importers' U.S. commercial shipments of subject imports went to secondary aluminum producers. CR/PR at Table II-1.

[176] Apparent U.S. consumption declined from 360,492 short tons in 2017 to 318,113 short tons in 2018 and 301,739 short tons in 2019; it was 88,136 short tons in interim 2019 and lower, at 74,994 short tons, in interim 2020. CR/PR at Tables IV-9, C-1.

share to low-priced subject imports. Moreover, the percentage declines in many of the domestic industry's performance indicators between 2017 and 2019, including capacity, production, U.S. shipments, and capital expenditures, substantially exceeded the percentage decline in apparent U.S. consumption.[177]

Although our examination focuses on the performance of the domestic industry as a whole, we note that issues have been raised pertaining to individual U.S. producers that may have affected the domestic industry's performance. The record indicates that some purchasers, including Wacker, have expressed concerns about a reduction of supply of silicon metal to the U.S. market as a result of Globe's 2015 merger with Grupo FerroAtlántica, Globe's filing of antidumping and countervailing duty petitions, and the reduction in Globe's production of silicon metal due to the idling of its production facilities in Alabama and New York in 2018 and ***.[178] Wacker's witnesses contend that these supply reductions by Globe, given the long-standing lack of capacity of the domestic industry to supply U.S. demand fully, have forced some silicon metal purchasers to turn to additional import sources of supply in light of the needs of those purchasers for reliable and diverse sources of supply.[179] We intend to examine further in any final phase of these investigations the effect on U.S. purchasers of such reductions in supply of silicon metal in the U.S. market, and the importance of multiple sources of supply to purchasers.

For purposes of the preliminary phase of these investigations, we find that the significant volume of low-priced cumulated subject imports, which significantly undersold the domestic like product and suppressed and depressed the prices of the domestic industry, had a significant adverse impact on the domestic industry.

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 Bosnia and Herzegovina, Iceland, and Malaysia that are allegedly sold in the United States at less than fair value and imports of the subject merchandise from Kazakhstan that are allegedly subsidized by the government of Kazakhstan.

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[177] CR/PR at Table C-1.

[178] CR/PR at II-6 to II-7 and Table III-3; *see* written conference testimony of Martina Schulze-Adams at Paragraphs 14-19. Wacker also contends that Globe was unable to meet its supply commitment to Wacker's WPNA facility in Tennessee, requiring WPNA to turn to import suppliers. Written conference testimony of Mary Beth Hudson at Paragraphs 14-17.

[179] Written conference testimony of Martina Schulze-Adams at Paragraphs 13-19; written conference testimony of Mary Beth Hudson at Paragraphs 7, 14-17.

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., Beverly, Ohio, and Mississippi Silicon LLC, Burnsville, Mississippi, on June 30, 2020, alleging that an industry in the United States is materially injured and threatened with material injury by reason of subsidized imports of silicon metal by the Government of Kazakhstan and less-than-fair-value ("LTFV") imports of silicon metal[1] from Bosnia and Herzegovina, Iceland, and Malaysia. The following tabulation provides information relating to the background of these investigations.[2] [3]

Effective date	Action
June 30, 2020	Petitions filed with Commerce and the Commission; institution of Commission investigations (85 FR 41063, July 8, 2020)
July 21, 2020	Commission's conference
July 20, 2020	Commerce's notice of initiation (85 FR 45173-45177, July 27, 2020)
August 13, 2020	Commission's vote
August 14, 2020	Commission's determinations
August 21, 2020	Commission's views

Note: Due to the COVID-19 pandemic, the Commission did not hold an in-person conference. Rather, parties provided opening remarks and witness testimony through written submissions prior to the date above.

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 appendix A, and may be found at the Commission's website (www.usitc.gov).

[3] A list of witnesses that participated in the conference via written submission is presented in appendix 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/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. 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 a variety of applications, which include aluminum (auto/commercial), chemicals (silicones), and polysilicon (solar and electronics). The three U.S. producers of silicon metal are Globe Metallurgical Inc. ("Globe")[6], Dow Corning Alabama ("DC Alabama")[7], and Mississippi Silicon LLC ("MS Silicon"), while leading subject country producers of silicon metal outside the United States include R-S Silicon D.O.O. Mrkonjic Grad ("RS Silicon") of Bosnia and Herzegovina, PCC BakkiSilicon hf ("PCC") of Iceland, Tau-Ken Temir LLP ("Tau-Ken") of Kazakhstan, and PMB Silicon Sdn Bhd ("PMB") of Malaysia. The leading U.S. importer of silicon metal from Bosnia and Herzegovina is ***,[8] while the leading importer of silicon metal from Iceland is ***, and the leading importer of silicon metal from both Kazakhstan and

[6] Globe Metallurgical Inc. is 100 percent wholly owned by Globe Specialty Metals, Inc. and Ferroglobe PLC is the direct parent company of Globe Specialty Metals, Inc. Petition, p. 2.

[7] Dow Corning Corporation became a wholly-owned subsidiary of Dow Chemical in 2016. Dow Chemical and DuPont subsequently merged to form DowDuPont on September 1, 2017. Dow Corning Corporation changed its name to the Dow Silicones Corporation, effective February 1, 2018. Dow Corning Alabama is a subsidiary of the Dow Silicones Corporation.

[8] ***.

Malaysia is ***. Leading importers of product from nonsubject countries (primarily Brazil, Canada, and Norway) includes ***. U.S. purchasers of silicon metal are firms that include primary and secondary aluminum producers and silicon-based chemical producers. Leading purchasers include ***.

Apparent U.S. consumption of silicon metal totaled approximately 301,739 short tons of contained silicon ($702 million) in 2019. Currently, three firms are known to produce silicon metal in the United States. U.S. producers' U.S. shipments of silicon metal totaled 145,692 short tons ($347 million) in 2019 and accounted for 48.3 percent of apparent U.S. consumption by quantity and 49.4 percent by value. U.S. imports from subject sources totaled 29,857 short tons ($53.6 million) in 2019 and accounted for 9.9 percent of apparent U.S. consumption by quantity and 7.6 percent by value. U.S. imports from nonsubject sources totaled 126,190 short tons ($301.6 million) in 2019 and accounted for 41.8 percent of apparent U.S. consumption by quantity and 43.0 percent by value.

Summary data and data sources

A summary of data collected in these investigations is presented in appendix C, table C-1. Except as noted, U.S. industry data are based on questionnaire responses of three firms that accounted for all U.S. production of silicon metal during 2019. U.S. imports are based on official import statistics[9] and on questionnaire responses from 17 U.S. importers that are believed to account for *** of subject imports from Bosnia and Herzegovina, *** percent of subject imports from Iceland, *** percent of subject imports from Kazakhstan, *** percent of subject imports from Malaysia, and *** percent of imports of silicon metal from combined subject sources in 2019. During 2019, imports of silicon metal from nonsubject sources accounted for *** percent of imports from nonsubject countries and *** percent of all imports of silicon metal from all sources. Foreign industry data are based on questionnaire responses of one firm in Bosnia and Herzegovina whose exports accounted for *** percent of U.S. imports of silicon metal from Bosnia and Herzegovina, one firm in Iceland whose exports accounted for *** percent of U.S. imports of silicon metal from Iceland, one firm in Kazakhstan whose exports accounted for *** percent of U.S. imports of silicon metal from Kazakhstan, and one firm in Malaysia whose exports accounted for *** U.S. imports of silicon metal from Malaysia in 2019.

[9] Official import statistics are based on General Imports using statistical reporting numbers 2804.69.1000 and 2804.69.5000, which measure 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.

Previous and related investigations

Silicon metal has been the subject of several prior import injury proceedings in the United States. The following tabulation presents information regarding previous antidumping and countervailing duty investigations. Table I-1 presents the previous and related silicon metal investigations.

Table I-1
Silicon metal: Previous and related investigations

Year petition filed	Inv. number	Country	USITC publication	Current status
1990	731-TA-470	Argentina[1]	3385	Commerce revoked effective 1/1/2000 (66 FR 10669, 2/16/2001)
1990	731-TA-471	Brazil[1]	3892	Commerce revoked effective 2/16/06 (71 FR 76635, 12/21/2006)
1990	731-TA-472	China	3892	Continuation of order effective 5/25/2018 (83 FR 25644, 6/4/2018)
2002	731-TA-991	Russia	3584	Continuation of order effective 6/24/2020 (85 FR 37831, 6/24/2020)
2004	701-TA-441	Brazil	N/A	Petitions withdrawn on 4/16/2004 (69 FR 23213, 4/28/2004)
2004	731-TA-1081	South Africa	N/A	Petitions withdrawn on 4/16/2004 (69 FR 23213, 4/28/2004)
2017	731-TA-1343 and 701-TA-567	Australia[2]	4773	Negative ITC determinations
2017	731-TA-1344 and 701-TA-568	Brazil[2]	4773	Negative ITC determinations
2017	701-TA-569	Kazakhstan[2]	4773	Negative ITC determinations
2017	731-TA-1345	Norway[2]	4773	Negative ITC determinations

[1] Petitions were filed concurrently with the petition related to silicon metal from China (731-TA-472, order continued in 2018).

[2] Commerce made its final determinations on March 8, 2018, and the Commission made its final negative determinations on April 10, 2018.

Source: *Silicon Metal from Australia, Brazil, Kazakhstan, and Norway,* Inv. Nos. 701-TA-567-569 and 731-TA-1343-1345 (Final), USITC Publication 4773, April 2018; *Silicon Metal From Russia, Investigation No. 731-TA-991 (Third Review)*, USITC Publication 5058, May 2020; and cited FR notices.

Nature and extent of alleged subsidies and sales at LTFV

Alleged subsidies

On July 27, 2020, Commerce published a notice in the *Federal Register* of the initiation of its countervailing duty investigation on silicon metal from Kazakhstan.[10] Commerce identified the following government eight programs in Kazakhstan:

- Corporate income tax exemption
- Property tax exemption
- Land tax and land use fee exemption
- Customs duty exemption
- Provision of electricity for less than adequate renumeration (LTAR)
- Provision of water for LTAR
- Provision of drainage system services for LTAR
- Debt forgiveness

Alleged sales at LTFV

On July 27, 2020, Commerce published a notice in the *Federal Register* of the initiation of its antidumping duty investigations on product from Bosnia and Herzegovina, Iceland, and Malaysia.[11] Commerce has initiated antidumping duty investigations based on estimated dumping margins of 21.41 percent for product from Bosnia and Herzegovina, 28.12 to 47.54 percent for product from Iceland, and 11.49 to 16.92 percent for product from Malaysia.

The subject merchandise

Commerce's scope

In the current proceeding, Commerce has defined the scope as follows:[12]

> *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*

[10] 85 FR 45173, July 27, 2020; Countervailing Duty Investigation Initiation Checklist, Commerce, July 20, 2020, pp. 6-13.

[11] 85 FR 45177, July 27, 2020.

[12] 85 FR 45177, July 27, 2020.

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.

Silicon metal is currently classifiable under subheadings 2804.69.1000 and 2804.69.5000 of the HTSUS. While the 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 Commerce, information available to the Commission indicates that the merchandise subject to these investigations is imported under the following provisions of the Harmonized Tariff Schedule of the United States ("HTS") - 2804.69.10 (covering shipments of silicon containing, by weight, less than 99.99 percent silicon but not less than 99 percent silicon) and 2804.69.50 (for other silicon containing, by weight, less than 99 percent silicon). High-content silicon (containing, by weight, not less than 99.99 percent silicon) is imported under HTS subheading 2804.61.00 and is not included in these investigations. The 2020 general rate of duty is 5.3 percent *ad valorem* for HTS subheading 2804.69.10, and 5.5 percent *ad valorem* for HTS subheading 2804.69.50.[13] Silicon metal that is the product of Kazakhstan or Bosnia and Herzegovina and is classified in HTS subheading 2804.69.10 is eligible for duty-free entry under the Generalized System of Preferences, but not under HTS subheading 2804.69.50.[14] Decisions on the tariff classification and treatment of imported goods are within the authority of U.S. Customs and Border Protection.

Section 301 tariff treatment

Based on the scope set forth by Commerce, none of the merchandise described by the scope is currently subject to additional duties under section 301 of the Trade Act of 1974, as amended.[15] However, out-of-scope semiconductor grade silicon metal (containing at least

[13] *HTSUS (2020) Revision 14*, USITC Publication No. 5088, July 2020, p. 28-4.

[14] USITC, "General Notes, Products of Countries Designated Beneficiary Developing Countries for Purposes of the Generalized System of Preferences (GSP)," *HTSUS (2020) Revision 14*, GN p. 11. See HTS general note 4.

[15] Section 301 of the *Trade Act of 1974*, as amended (19 U.S.C. § 2411) authorizes the Office of the United States Trade Representative ("USTR"), at the direction of the President, to take appropriate action to respond to a foreign country's unfair trade practices. On August 18, 2017, USTR initiated an investigation into certain acts, policies, and practices of the Government of China related to technology (continued...)

99.99 percent silicon by actual weight) originating in China and entering under HTS statistical reporting number 2804.61.0000 are subject to additional 25 percent section 301 ad valorem duties, effective May 10, 2019.[16] See also U.S. notes 20(e) and 20(f), subchapter III of chapter 99.[17] [18]

The product

Description and applications

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 comprise more than 25 percent of the Earth's crust. Silica in the form of quartz[19] 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.[20] Silicon metal is

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(…continued)

transfer, intellectual property, and innovation (82 FR 40213, August 24, 2017). On April 6, 2018, USTR published its determination that the acts, policies, and practices of China under investigation are unreasonable or discriminatory and burden or restrict U.S. commerce, and are thus actionable under section 301(b) of the *Trade Act* (83 FR 14906, April 6, 2018).

[16] HTS subheading 2804.61.0000 was included in the USTR's third enumeration ("Tranche 3") of products originating in China that became subject to an additional 10 percent ad valorem Section 301 duties (Annexes A and C of 83 FR 47974), on or after September 24, 2018. Tranche 3 covered 6,031 tariff subheadings, with an approximate annual trade value of $200 billion (83 FR 47974, September 21, 2018). Escalation of this duty to 25 percent ad valorem was rescheduled from January 1, 2019 (annex B of 83 FR 14906, April 6, 2018) to March 2, 2019 (83 FR 65198, December 19, 2018), but was subsequently postponed until further notice (84 FR 7966, March 5, 2019), and then was implemented as of May 10, 2019 (84 FR 20459, May 9, 2019).

[17] *HTSUS* (2020) Revision 18, USITC Publication 5102, July 2020, pp. 99-III-23 to 99-III-24, 99-III-42, 99-III-213.

[18] Certain silica and quartz sands (the primary raw material inputs for silicon metal) originating in China and entering under HTS statistical reporting numbers HTS 2505.10.1000 and 2505.10.5000 are subject to additional 25 percent duties under Section 301 of the Trade Act of 1974. U.S. imports of these products from China were minimal from 2017 – June 2020 and it is not known if any if the imports were used for silicon metal production or for other applications. Based on record for this and other recent silicon metal investigations, domestic producers use domestically sourced sands and do not import any of these sands from China for the production of silicon metal.

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

[20] USGS, *2017 Minerals Yearbook, Silicon Chapter*, p. 67.1,

(continued...)

a product normally composed almost entirely of elemental silicon, along with small amounts of other elements, such as iron, aluminum, and calcium.[21] 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 inch to 4 inches x ¼ inch, or in powder form.[22] According to Roskill Information Service LLC ("Roskill"), global silicon metal consumption increased by 6.5 percent per year between 2010 and 2019.[23]

Silicon metal is principally used as an alloying agent in aluminum production by the aluminum industry, as an input in the production of silicones, and to produce polycrystalline silicon ("polysilicon"). 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.[24] Aluminum producers add silicon in lump form to aluminum during the smelting process. Primary aluminum typically contains between 8-12 percent silicon and is used in applications where appearance is important, such as wheels for automobiles. Secondary aluminum typically contains less silicon than primary aluminum and is used for internal automobile parts and applications where appearance is not significant. Other applications for silicon metal include the production of brass and bronzes, die casting, steel, copper alloys, ceramic powders, and refractory coatings.

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

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(…continued)

https://prd-wret.s3-us-west-2.amazonaws.com/assets/palladium/production/atoms/files/myb1-2017-simet.pdf, retrieved July 8, 2020.

[21] Silicon metal that is subject these investigations can be used as a starting material for the manufacture of ultra-high-purity semiconductor or solar grades whose silicon content is 99.99 percent or greater. Semiconductor and solar grade silicon metal is not included within the scope of these investigations.

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

[23] *Silicon & Ferrosilicon: Outlook to 2029,* Roskill Information Services, Ltd., May 5, 2020. https://roskill.com/market-report/silicon-ferrosilicon/.

[24] 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.

facilities purchase silicon metal as a powder.[25] A lower grade of powder called fines, a byproduct 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 adhesives, resins, lubricants, plastomers, anti-foaming agents, and water-repellent compounds.[26]

Silicon metal that is included in these investigations is also consumed as the base material for making polysilicon, a high-purity form of silicon manufactured by chemical producers that is primarily used in semiconductors and solar cells.[27] Polysilicon producers purchase in-scope silicon metal and then further refine it into higher-purity polysilicon that is not in the scope of these investigations. Polysilicon producers typically have very stringent quality standards for silicon and sometimes require low-boron silicon metal. According to Roskill, silicon consumption for use in solar applications more than tripled between 2010 and 2019.[28]

According to Globe, 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.[29] These specifications establish the minimum amounts of silicon and the maximum amounts of other elements, such as boron, 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

[25] 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 manufacturer. For that reason, there is no difference in terms of size consistency between qualified imports and domestic products.

[26] 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.

[27] Polysilicon, which is not within the scope of these investigations, 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.

[28] *Silicon & Ferrosilicon: Outlook to 2029,* Roskill Information Services, Ltd., May 5, 2020. https://roskill.com/market-report/silicon-ferrosilicon/.

[29] 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.

differences between these ranges of specifications can be relatively small but important.[30] There are four broadly defined categories, or grades, of silicon metal, which are generally ranked in descending order of purity as: (1) semiconductor grade;[31] (2) chemical grade; (3) metallurgical grade used to produce primary aluminum; and (4) metallurgical grade used to produce secondary aluminum. Petitioner Globe lists its silicon metal product specifications as:[32]

- High purity grade: silicon 98.50 percent min., iron 0.10 percent max., calcium 0.07 percent max., aluminum 0.20 percent max.
- 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.

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. Some chemical and 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 and that there are no changes to manufacturing

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[30] According to the petitioners, in some cases, higher grade silicon metal is shipped to a purchaser with a lower specification requirement. However, according to respondent PCC, this does not happen because it does not make commercial sense for silicon metal producers to sell a high cost, high grade silicon metal at a loss Higher quality grades are more expensive to produce, require more production effort and therefore, having reached the requisite quality, down-selling it would not make any sense. Furthermore, a customer operating in, for example, the secondary aluminum market may need specifications that are different from those present in chemical grade silicon metal.; Petitioners' Witness Testimony, Exhibit 3, p. 18.; Respondents' (Icelandic producers) postconference brief, attachment B, p. 9.; Wacker also states that this type of sale likely never happens, for the same reasons indicated by PCC.; Respondents' (Wacker) postconference brief, p. 9.

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

[32] Petition, Vol. 1, p. 7.; The petitioners stated that the type and level of impurities and the silicon content are the principal factors that determine if the silicon metal product can be used in a given application. As such, it is not possible to assume that silicon metal imported under HTS subheading 2804.69.10 (silicon containing by weight less than 99.99 percent but not less than 99.00 percent silicon) is necessarily better quality than silicon metal imported under HTS subheading 2804.69.50 (silicon containing by weight less than 99.00 percent silicon), even though the silicon content of the former is higher.

location, process conditions, or raw materials.[33] According to the petitioners, silicon metal produced to the same specification is wholly interchangeable for its intended application. Moreover, if silicon metal produced for one end user possesses specifications that fall within the parameters of the specifications of a different end-user, whether in their end-use segment or another, then the silicon metal could be used interchangeably.[34] Respondent PCC indicates that clear distinctions exist between chemical and primary and secondary aluminum grades, based on the chemical composition, which affects quality. According to PCC, chemical grade silicon metal is higher quality and commands a higher price than the aluminum grades, and due to chemical composition requirements, different grades would not be interchangeable.[35] Respondent Wacker also argues that different grades of silicon metal are not interchangeable or fungible.[36] ***[37]

Manufacturing processes[38]

In general, all silicon metal, regardless of specification, is produced using essentially the same process and inputs (figure I-1).[39] Silica in the form of high purity quartz is combined in a "charge" with a carbonaceous reductant such as low-ash coal, charcoal, or petroleum coke, and a bulking agent, usually wood chips. The charge is placed in a submerged arc electric furnace. Electrical energy is delivered from a transformer system to the furnace. High-current, low-voltage electricity is delivered to the reaction by electrodes — conductors made from pre-baked or self-baking amorphous carbon.

[33] The secondary aluminum segment does not typically require suppliers to go through a qualification process and instead accepts a certification and chemical analysis report instead, making this segment easier to access, especially for new market entrants.; *Answers to Staff Questions,* Petitioners' postconference brief, p. 2.

[34] *Answers to Staff Questions,* Petitioners' postconference brief, pp. 1-2.

[35] Respondents' (Icelandic producers) postconference brief, p. 2.

[36] Respondents' (Wacker) postconference brief, p. 3

[37] Respondents' (Icelandic producers) postconference brief, attachment B, p. 2.

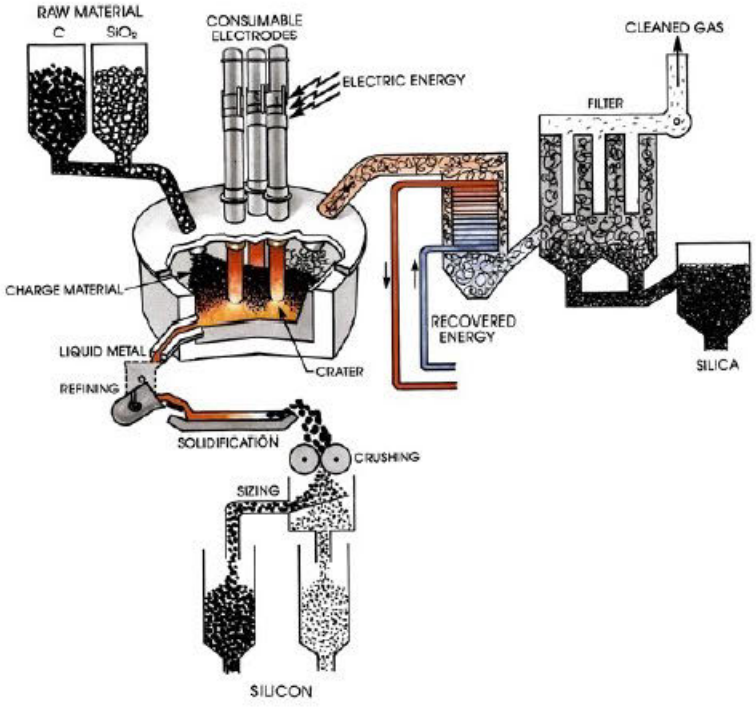
[38] Unless otherwise indicated, information in this section was taken from the Petition, Vol. 1, pp. 9-10, and *Silicon Metal from Australia, Brazil, Kazakhstan, and Norway.* Inv. No. 701-567-569 and 731-TA-1343-1345 (Final) USITC Publication 4773, April 2018, pp. I-15–I-18

[39] Petitioners claim they are not aware of any production differences between silicon metal produced in the United States and silicon metal produced in respondent countries. Moreover, petitioners claim there should be no differences in the composition of silicon metal produced by U.S. producers and silicon metal imported from subject countries. *Answers to Staff Questions,* Petitioners' postconference brief, p. 4.

The charge is heated to approximately 3,000 degrees Fahrenheit. At this temperature, the oxygen in the SiO2 separates from the silicon and combines with the carbon in the reductant to form carbon monoxide gas. The simplified chemical reaction is: $SiO_2 + 2C \rightarrow Si + 2CO$. The gas escapes, leaving molten silicon. The silicon is removed or "tapped" from 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.[40] 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 can be further ground into powder for some customers in the chemicals industry. The silicon is typically delivered to end users in 2,000- to 3,000-pound super sacks, wooden boxes, or customer specific packaging. Some customers elect to send their own trucks to the plant to take the silicon in bulk form.

[40] The most important factor in raw material selection is the iron content of the quartz or gravel being used, because the silicon production process does not allow iron content to be changed. Other impurities can be and are controlled through different types of refining; *Answers to Staff Questions,* Petitioner's postconference brief, p. 3; Respondent PCC notes that raw materials can differ in chemical composition from country to country; Respondents' (Icelandic producers) postconference brief, attachment B, p. 5.

Figure I-1



Source: Xakalashe, B.S. and M. Tangsted, "Silicon Processing: From Quartz to Crystalline Silicon Solar Cells" *Southern African Prometallurgy 2011,* Southern African Institute of Mining and Metallurgy, Johannesburg, March 2011, p. 88.

By-products in the production process of silicon metal are silica fume, silicon dross, silicon fines, crusher dust, slag, and heavies.[41]

Silicon metal plants are typically located at sites that have access to a competitively priced and reliable source of electricity, an ample supply of raw materials, and an adequate

[41] 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, refractories and ceramics, and other products. Silicon dross/slag is material raked out of ladles used in casting silicon metal. The Si content is generally 40-50%, with the balance mainly aluminum and/or calcium oxides. Dross is used to make silicon briquettes, which are further used in the steel and iron foundry industries. Silicon fines (sometimes called silicon particles) are generated during the crushing/sizing of silicon metal to the final size required by customers. A certain quantity of the metal being crushed winds up being too small to sell as silicon metal. These fines are also used to make silicon briquettes. Crusher dust is also generated during crushing/sizing of materials. Heavies are slightly larger particles that are swept up in the off-gas flow from the furnace. These are often small parts of wood, gravel dust, or coal ash. They are segregated out of the off-gas flow before it reaches the baghouse. Heavies are used to make filling agent for hot metal coatings in foundry applications or are mixed with lime to make ladle covers for the steel industry.; *Answers to Staff Questions,* Petitioners' postconference brief, pp. 10-13.

labor pool. In particular, given the large amounts of quartz required to produce silicon metal, plants are normally located near quartz sources. Silicon plants typically operate furnaces 24 hours per day, 7 days per week, to maximize efficiency, so they constantly consume raw materials. Forty-nine percent of the cost of silicon metal production is attributable to raw materials (coal, woodchips, quartz, and carbon electrodes), 21 percent to energy, 18 percent to labor, and 12 percent to other costs.[42]

Submerged arc furnaces used for silicon production are relatively similar worldwide, but there are some physical differences in furnace designs and the electrodes. Certain 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, but some plants with newer furnaces, like Mississippi Silicon, are able to produce the same quantity of silicon metal using only 9,500 to 10,000 kilowatt hours of electricity.[43] Purities of the raw materials and the carbon sources used can vary widely.

Some producers of silicon metal also produce ferrosilicon.[44] Ferrosilicon is an alloy of iron and silicon with silicon content varying from 45 percent to 90 percent and the iron content making up most of the remaining specification. Ferrosilicon is used in the production of steel (especially stainless and heat-resisting steel) and cast iron. Silicon metal and ferrosilicon are produced using similar production processes and equipment, but the same furnaces cannot produce both products at the same time. It is generally easier (less time consuming) for firms to switch from silicon metal production to ferrosilicon production than the reverse. Ferrosilicon can be produced at lower temperatures than silicon because of the iron content, resulting in less power consumed to produce ferrosilicon than silicon. It is less costly to produce ferrosilicon than silicon metal.[45] Depending on the producer, there may be certain differences in the type of electrodes used, and there are differences in terms of raw material selection.[46] According to Wacker, ferrosilicon production uses self-baked electrodes which are less costly than pre-baked

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[42] *Silicon Metal from Australia, Brazil, Kazakhstan, and Norway.* Inv. No. 701-567-569 and 731-TA-1343-1345 (Final) USITC Publication 4773, April 2018, p. I-18.

[43] *Answers to Staff Questions,* Petitioners' postconference brief, pp. 4-5.

[44] This includes magnesium ferrosilicon, which is an alloy of iron, silicon, magnesium, calcium, and rare earths. The silicon content varies from 42 percent to 48 percent, the magnesium content varies from 3 percent to 9 percent, the calcium content varies from 0.25 to 3.25 percent, and rare earths vary from 0.1 percent to 3.5 percent. For most specifications, it is cheaper to produce magnesium ferrosilicon than silicon metal; however, depending on the cost of raw material inputs for highly alloyed specifications, costs could be on par with silicon metal.

[45] *Answers to Staff Questions,* Petitioners' postconference brief, p. 14.

[46] *Answers to Staff Questions,* Petitioners' postconference brief, p. 3.

or graphite electrodes. The quartz used to produce ferrosilicon doesn't have to meet the high standards on iron content that is required to produce silicon and can be sourced from a large number of gravel mines. Moreover, tapping of the finished product can be done into larger ladles that are often up to five times bigger than conventional ladles used to tap silicon metal. Ferrosilicon is usually not refined to adjust its quality, and as such, the ladles are not equipped with the fittings required for refining.[47] In the United States, Globe produces both silicon metal and ferrosilicon, but did not use the same furnaces for both. Mississippi Silicon does not produce ferrosilicon.

According to Globe, ***[48]

Domestic like product issues

No issues with respect to domestic like product have been raised in these investigations.

[47] Respondents' (Wacker) postconference brief, p. 7.
[48] *Answers to Staff Questions,* Petitioners' postconference brief, p. 15.

Part II: Conditions of competition in the U.S. market

U.S. market characteristics

Silicon metal is a polycrystalline material typically sold in lump form. Chemical producers, primary aluminum producers, and secondary aluminum producers are the principal end users of silicon metal. Demand for silicon metal is derived from the demand for the silicon-based chemicals (silicones for use in the solar and electronics industries) and aluminum alloys in which it is used as an input.[1]

Apparent U.S. consumption of silicon metal decreased between 2017 and 2019. Overall, apparent U.S. consumption in 2019 was 16.3 percent lower than in 2017.

Channels of distribution

U.S. producers sold mainly to polysilicon and chemical producers, as shown in table II-1. Importers from all subject countries sold mainly to secondary aluminum end users.

Table II-1
Silicon metal: U.S. producers' and importers' U.S. commercial shipments, by sources and channels of distribution, 2017-19, January to March 2019 and January to March 2020

Item	Period				
	Calendar year			January-March	
	2017	2018	2019	2019	2020
	Share of reported shipments (percent)				
U.S. producers' U.S. commercial shipments of silicon metal:					
Distributors	***	***	***	***	***
Chemical/polysilicon producers	***	***	***	***	***
Primary aluminum producers	***	***	***	***	***
Secondary aluminum producers	***	***	***	***	***
Other end users	***	***	***	***	***
U.S. importers' U.S. commercial shipments of silicon metal from Bosnia and Herzegovina:					
Distributors	***	***	***	***	***
Chemical/polysilicon producers	***	***	***	***	***
Primary aluminum producers	***	***	***	***	***
Secondary aluminum producers	***	***	***	***	***
Other end users	***	***	***	***	***

Table continued on next page

[1] *Silicon Metal From Australia, Brazil, Kazakhstan, and Norway*, 83 FR 16382, April 16, 2018.

Table II-1--Continued
Silicon metal: U.S. producers' and importers' U.S. commercial shipments, by sources and channels of distribution, 2017-19, January to March 2019 and January to March 2020

Item	Period				
	Calendar year			January-March	
	2017	2018	2019	2019	2020
	Share of reported shipments (percent)				
U.S. importers' U.S. commercial shipments of silicon metal from Iceland:					
Distributors	***	***	***	***	***
Chemical/polysilicon producers	***	***	***	***	***
Primary aluminum producers	***	***	***	***	***
Secondary aluminum producers	***	***	***	***	***
Other end users	***	***	***	***	***
U.S. importers' U.S. commercial shipments of silicon metal from Kazakhstan:					
Distributors	***	***	***	***	***
Chemical/polysilicon producers	***	***	***	***	***
Primary aluminum producers	***	***	***	***	***
Secondary aluminum producers	***	***	***	***	***
Other end users	***	***	***	***	***
U.S. importers' U.S. commercial shipments of silicon metal from Malaysia:					
Distributors	***	***	***	***	***
Chemical/polysilicon producers	***	***	***	***	***
Primary aluminum producers	***	***	***	***	***
Secondary aluminum producers	***	***	***	***	***
Other end users	***	***	***	***	***
U.S. importers' U.S. commercial shipments of silicon metal from all subject sources:					
Distributors	***	***	***	***	***
Chemical/polysilicon producers	***	***	***	***	***
Primary aluminum producers	***	***	***	***	***
Secondary aluminum producers	***	***	***	***	***
Other end users	***	***	***	***	***
U.S. importers' U.S. commercial shipments of silicon metal from nonsubject sources:					
Distributors	***	***	***	***	***
Chemical/polysilicon producers	***	***	***	***	***
Primary aluminum producers	***	***	***	***	***
Secondary aluminum producers	***	***	***	***	***
Other end users	***	***	***	***	***

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

Geographic distribution

U.S. producers reported selling silicon metal to all regions in the contiguous United States (table II-2). Importers reported selling to mainly all regions of the continental United States except the Mountain region. 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	Bosnia and Herzegovina	Iceland	Kazakhstan	Malaysia
Northeast	2	---	1	2	2
Midwest	3	---	2	4	3
Southeast	3	---	2	3	1
Central Southwest	2	---	1	1	1
Mountain	2	---	---	---	---
Pacific Coast	2	---	1	---	1
Other	---	---	---	---	---
All regions (except Other)	1	---	---	---	---
Reporting firms	3	---	2	4	3

Note: All other U.S. markets, including AK, HI, PR, and VI.
Note: ***.

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

Supply and demand considerations

U.S. supply

Table II-3 provides a summary of the supply factors regarding silicon metal from U.S. producers and from subject countries. Both Iceland and Malaysia reported no production in 2017, resulting in a substantial overall increase in the capacity of the combined subject countries between 2017 and 2019.

Table II-3
Silicon metal: Supply factors that affect the ability to increase shipments to the U.S. market

Country	Capacity (1,000 short tons contained silicon)		Capacity utilization (percent)		Ratio of inventories to total shipments (percent)		Shipments by market, 2019 (percent)		Able to shift to alternate products
	2017	2019	2017	2019	2017	2019	Home market shipments	Exports to non-U.S. markets	No. of firms reporting "yes"
United States	***	***	***	***	***	***	***	***	2 of 3
Bosnia and Herzegovina	***	***	***	***	***	***	***	***	0 of 1
Iceland	***	***	***	***	***	***	***	***	0 of 1
Kazakhstan	***	***	***	***	***	***	***	***	0 of 1
Malaysia	***	***	***	***	***	***	***	***	0 of 1
Subject countries	***	***	***	***	***	***	***	***	0 of 4

Note: Responding U.S. producers accounted for all U.S. production of silicon metal in 2019. Responding foreign producer/exporter firms accounted for all U.S. imports of silicon metal from Bosnia and Herzegovina Iceland, Kazakhstan and Malaysia during 2019. For additional data on the number of responding firms and their share of U.S. production and of U.S. imports from each subject country, please refer to Part I, "Summary Data and Data Sources."

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

Domestic production

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

Both U.S. capacity and U.S. production declined between 2017 and 2019; however production declined more than capacity, resulting in reduced capacity utilization. Export markets include Canada, Germany, and the United Kingdom. Another product that producers reportedly can produce on the same equipment as silicon metal is ferrosilicon. Factors affecting U.S. producers' ability to shift production include developing a new customer base, downtime requirements, investment in capital, and purchasing different raw material. ***."

Subject imports from Bosnia and Herzegovina

Based on available information, the producer of silicon metal from Bosnia and Herzegovina 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 the availability of large inventories and the ability to shift shipments from alternate markets. Factors mitigating responsiveness of supply include limited availability of unused capacity and no ability to shift production to or from alternate products.

Capacity utilization increased as production increased while capacity was unchanged. The producer from Bosnia and Herzegovina cannot produce other products on its equipment ***. Its main export market is *** and no barriers are reported to prevent shifting between markets.

Subject imports from Iceland

Based on available information, producers of silicon metal from Iceland have the ability to respond to changes in demand with large 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 the availability of unused capacity, the ability to shift shipments from alternate markets, and some inventories. A factor mitigating responsiveness of supply is the limited ability to shift production to or from alternate products.

***. The Icelandic producer reported it was not feasible to produce other products on the same equipment as it used to produce silicon metal. Factors reducing the Icelandic producer's ability to produce to full capacity include severe winter conditions, and that the newness of the plant creates operational issues. Its main export market is the EU and no barriers are reported to prevent shifting between markets.

Subject imports from Kazakhstan

Based on available information, the producer of silicon metal from Kazakhstan has the ability to respond to changes in demand with large 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 the availability of unused capacity, ability to shift shipments from alternate markets, and some inventories. A factor mitigating responsiveness of supply is limited ability to shift production to or from alternate products.

Kazakh capacity utilization fell between 2017 and 2019 as capacity was unchanged but production fell. Major export markets included the EU and Commonwealth of Independent States. The Kazakh producer reported it could not produce products on the same equipment as it used to produce silicon metal. ***.

Subject imports from Malaysia

Based on available information, the producer of silicon metal from Malaysia has 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 the ability to shift production to or from alternate markets and large inventories. Factors mitigating responsiveness of supply include limited availability of unused capacity, and the lack of ability to shift production to or from alternate products.

Production of silicon metal in Malaysia began in 2019; ***. The Malaysian producer reported that it was not feasible to produce other products on the same equipment as it uses to produce silicon metal. Other export markets included ***.

Imports from nonsubject sources

Nonsubject imports accounted for 81 percent of total U.S. imports in 2019. The largest sources of nonsubject imports during January 2017 to March 2020 were Brazil, Canada, and Norway. Combined, these countries accounted for 85 percent of nonsubject imports in 2019.

Supply constraints

No U.S. producers reported any supply constraints in the market for silicon metal. Three of the 12 responding importers reported supply constraints, including shutdowns of the plants in Iceland and Kazakhstan, limitations on imports due to the current investigations, and the lack of inventories held in the United States which made one importer unable to quoted spot basis truckload sales. A number of firms reported issues either with Globe or with the merger of Globe with non U.S. suppliers FerroAtlantica; these include: the merger has reduced the diversity of supply; Globe reduced U.S. production of silicon metal and supplies its purchasers with material produced at its overseas facilities; closure of Globe plants has reduced U.S.

production; and following the unsuccessful antidumping action brought by Globe, there has been a backlash against Globe by some firms determined not to do business with it.

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. Silicon metal accounts for a small share of the total cost of its end-use products, and demand responsiveness is constrained by the lack of substitute products.

End uses and cost share

U.S. demand for silicon metal depends on the demand for U.S.-produced downstream products. Silicon metal is primarily used by chemical producers and by aluminum producers as an alloying agent. Available information indicates that silicon metal accounts for a small share of the cost of the end-use products in which it is used. Specific end uses previously identified by firms include: aluminum alloys, aluminum billet used in a direct extrusion process, aluminum casting, aluminum die-casting, die cast alloys, elastomers, foundry alloys, high silicon aluminum alloys, ingot, molten metal, primary aluminum, secondary aluminum, secondary aluminum alloys, and secondary aluminum ingot, chlorosilanes, polycrystalline silicon, polysilicon, sealants, silicones, and silicone adhesive sealants.[2] The cost share of silicon metal in the production of aluminum was estimated to be 10 percent, for aluminum alloys it ranged from 7 to 88 percent, for chlorosilane from 8 to 22 percent, and for other applications from 5 to 40 percent.

Business cycles

Two of 3 U.S. producers and 7 of 15 importers indicated that the market was subject to business cycles or conditions of competition. Specifically, demand in the aluminum sector was reported to reflect auto production; demand in the chemical market was reported to reflect solar and electronic demand growth; demand is heavily depended on the aluminum industry and many consumer products. A number of firms reported changes at Globe and or Globe's merger with FerroAtlantica as a change in the conditions of competition. These responses have been included under supply constraints.

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[2] *Silicon Metal from Australia, Brazil, Kazakhstan, and Norway*, 83 FR 16382, April 16, 2018.

Demand trends

Most firms reported a decrease in U.S. demand for silicon metal since January 1, 2017 (table II-4).

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

Item	Increase	No change	Decrease	Fluctuate
Demand in the United States				
U.S. producers	---	---	2	1
Importers	2	3	7	2
Demand outside the United States				
U.S. producers	2	---	1	---
Importers	6	2	4	2

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

Substitute products

Substitutes for silicon metal are limited. Two of 3 responding producers and 14 of 15 responding importers reported no substitutes. One producer and one importer reported that aluminum scrap was a substitute for silicon metal. These firms reported that as Chinese demand for aluminum scrap (which contains silicon) decreases, the price of aluminum scrap to secondary aluminum producers decreases, these secondary aluminum producers are able to use more aluminum scrap containing silicon and therefore demand less silicon metal.

Substitutability issues

The degree of substitution between domestic and imported silicon metal depends upon such factors as relative prices (discounts/rebates), quality (e.g., grade standards, defect rates, etc.), and conditions of sale (e.g., lead times between order and delivery dates, reliability of supply, product services, etc.). Based on available data, staff believes that there is high degree of substitutability between domestically produced silicon metal and silicon metal imported from Bosnia and Herzegovina, Iceland, Kazakhstan, and Malaysia. Substitutability may be limited to the extent that the silicon metal imported from these countries is typically sold to a different sector of the market and different sectors of the market can accept different chemistry of the silicon metal.

Lead times

Silicon metal is primarily produced-to-order. U.S. producers reported that *** percent of their commercial shipments were produced-to-order, with lead times averaging *** days. The remaining *** percent of their commercial shipments came from inventories, with lead times averaging *** days. Importers reported that *** of their commercial shipments

were from U.S. inventories, with lead times averaging *** days the remaining *** came from overseas inventories, with lead times averaging *** days.[3]

Factors affecting purchasing decisions

Purchasers responding to lost sales/lost revenue allegations[4] were asked to identify the main purchasing factors their firm considered in their purchasing decisions for silicon metal. Thirteen of the 14 responding purchasers listed price or cost as one of its top 3 factors. However, most purchasers (9 of 14) listed quality as the most important factor and 12 purchasers listed quality one of the top three factors. Availability/supply/delivery was also listed as one of the top factors by 11 of the 14 responding purchasers. Payment terms, service, availability in bulk vs bags, and having multiple sources were also listed as among the top three factors by at least one purchaser.

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 Bosnia and Herzegovina, Iceland, Kazakhstan, and Malaysia, U.S. producers and importers were asked whether the products can always, frequently, sometimes, or never be used interchangeably. As shown in table II-5, most U.S. producers reported that silicon metal from all country pairs is always interchangeable. Most importers also reported product from all but one country pair was always interchangeable. For United States versus nonsubject country product the most common response was always interchangeable (5 of the 12 responding purchasers), but most responding importers (7) gave other responses. A number of firms reported that the level of different elements in silicon metal differed by the firm or country of production including: Brazilian silicon metal has low boron levels needed to produce high quality feed stock for polysilicon production; silicon metal with low calcium, iron and phosphorous can only be produced by a limited number of producers; and different producers in the same country may produce different quality silicon metal. In addition, firms reported that the levels of different elements that were acceptable differed by end use including: interchangeability differs by the type of purchasers, some end users require low calcium and low iron, others low calcium and phosphorus or other

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[3] Importer *** reported that it also sold produced-to-order silicon metal, with lead times averaging 120 days.

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

combinations; secondary aluminum producers can use some higher iron silicon metal which they combined with other silicon metal to reduce overall cost; aluminum grade silicon metal cannot be used in chemical applications, *** silicon metal from the subject countries cannot be used in silicones applications. In addition, each chemical user has its own specifications that suppliers fine-tune production for; thus, interchangeability is limited by time consuming and costly adjustments and acceptance requirements for new suppliers.

Table II-5
Silicon metal: Interchangeability between silicon metal produced in the United States and in other countries, by country pair

Country pair	Number of U.S. producers reporting				Number of U.S. importers reporting			
	A	F	S	N	A	F	S	N
U.S. vs. subject countries:								
U.S. vs. Bosnia and Herzegovina	2	---	---	---	5	---	3	---
U.S. vs. Iceland	2	---	---	---	5	---	3	---
U.S. vs. Kazakhstan	2	---	---	---	5	---	3	---
U.S. vs. Malaysia	2	---	---	---	5	---	3	---
Subject countries comparisons:								
Bosnia and Herzegovina vs. Iceland	2	---	---	---	5	1	3	---
Bosnia and Herzegovina vs. Kazakhstan	2	---	---	---	5	1	3	---
Bosnia and Herzegovina vs. Malaysia	2	---	---	---	5	1	3	---
Iceland vs Kazakhstan	2	---	---	---	4	1	3	---
Iceland vs Malaysia	2	---	---	---	5	1	3	---
Kazakhstan vs Malaysia	2	---	---	---	5	1	3	---
Nonsubject countries comparisons:								
U.S. vs. nonsubject	2	---	1	---	5	2	4	1
Bosnia and Herzegovina vs. nonsubject	2	---	---	---	5	1	3	---
Iceland vs. nonsubject	2	---	---	---	5	1	3	---
Kazakhstan vs. nonsubject	2	---	---	---	5	1	3	---
Malaysia vs. nonsubject	2	---	---	---	5	1	3	---

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

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

In addition, U.S. 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-6, most U.S. producers reported there were never differences other than price between silicon metal from any country pairs. Importer responses were mixed but most importers responded there were never or sometimes significant differences other than price for all country pairs. Differences other than price included: price is linked to quality, low quality material would increase the cost of producing downstream products, reduce the quality of the downstream products, and this would jeopardize the

importer's reputation; and Simcoa (Australia) produces silicon metal with very low iron, phosphorous, and boron that is not available from U.S. producers.

Table II-6
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	Number of U.S. producers reporting				Number of U.S. importers reporting			
	A	F	S	N	A	F	S	N
U.S. vs. subject countries:								
U.S. vs. Bosnia and Herzegovina	---	---	---	2	---	2	2	3
U.S. vs. Iceland	---	---	---	2	---	2	2	3
U.S. vs. Kazakhstan	---	---	---	2	---	2	2	3
U.S. vs. Malaysia	---	---	---	2	1	2	1	3
Subject countries comparisons:								
Bosnia and Herzegovina vs. Iceland	---	---	---	2	---	2	4	3
Bosnia and Herzegovina vs. Kazakhstan	---	---	---	2	---	2	4	3
Bosnia and Herzegovina vs. Malaysia	---	---	---	2	1	2	3	3
Iceland vs Kazakhstan	---	---	---	2	---	2	4	3
Iceland vs Malaysia	---	---	---	2	1	2	3	3
Kazakhstan vs Malaysia	---	---	---	2	1	2	3	3
Nonsubject countries comparisons:								
U.S. vs. nonsubject	---	---	1	2	1	2	6	4
Bosnia and Herzegovina vs. nonsubject	---	---	---	2	---	2	5	3
Iceland vs. nonsubject	---	---	---	2	---	2	5	3
Kazakhstan vs. nonsubject	---	---	---	2	---	2	5	3
Malaysia vs. nonsubject	---	---	---	2	---	2	5	3

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

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

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 all U.S. production of silicon metal during 2019.

U.S. producers

The Commission issued a U.S. producer questionnaire to three firms based on information contained in the petition, and all three firms (DC Alabama, Globe, and MS Silicon) provided usable data on their operations.[1] Staff believes that these responses represent all U.S. production of silicon metal.

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 shares of reported production, 2019

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

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

Table III-2 presents information on U.S. producers' ownership, related and/or affiliated firms.

[1] Globe's production facilities are located in Beverly, Ohio; Niagara, New York; Selma, Alabama; and Alloy, West Virginia. Its Niagara, NY and Selma, AL facilities were shutdown in 2018.

Table III-2
Silicon metal: U.S. producers' ownership, related and/or affiliated firms, 2017-19, January-March 2019, and January-March 2020

* * * * * * *

Table III-3 presents U.S. producers' reported changes in operations since January 1, 2017.

Table III-3
Silicon metal: U.S. producers' reported changes in operations, since January 1, 2017

* * * * * * *

U.S. production, capacity, and capacity utilization

Table III-4 and figure III-1 present U.S. producers' production, capacity, and capacity utilization during 2017-19, January-March 2019, and January-March 2020 (January-March is referred to as "interim"). From 2017 to 2019, domestic producers' capacity (for silicon metal production) decreased by *** percent, but domestic producers' capacity was higher by *** percent during interim 2020 than during interim 2019. During 2017-19, domestic producers' production of silicon metal decreased by *** percent, but it was higher by *** percent during interim 2020 than in interim 2019. During 2017-19, the domestic producers' capacity utilization decreased by *** percentage points, and it was lower by *** percent during interim 2020 than in interim 2019. From 2017 to 2019, *** capacity and production decreased by *** percent and *** percent, respectively, while *** capacity and production were both higher in interim 2020 than during interim 2019. During 2017-19, *** capacity for silicon metal production increased by *** percent, while its production decreased by *** percent during the same period. *** capacity was higher during interim 2020 but production was lower during interim 2020 than in interim 2019. *** capacity *** during 2017-19, while its production decreased ***. *** capacity *** during the interim periods of 2019 and 2020, while its production was lower during interim 2020 than in interim 2019.

Table III-4
Silicon metal: U.S. producers' production, capacity, and capacity utilization, 2017-19, January-March 2019, and January-March 2020

Item	Calendar year			January to March	
	2017	2018	2019	2019	2020
	Capacity (short tons contained silicon)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	***	***	***	***	***
	Production (short tons contained silicon)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms					
	Capacity utilization (percent)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	***	***	***	***	***
	Share of production (percent)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	100.0	100.0	100.0	100.0	100.0

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

Figure III-1
Silicon metal: U.S. producers' production, capacity, and capacity utilization, 2017-19, January-March 2019, and January-March 2020

* * * * * * *

Alternative products

As shown in table III-5, nearly 99 percent of the product produced during 2017 by U.S. producers was silicon metal, but nearly one quarter of total production during 2019 was shifted to ferrosilicon and magnesium ferrosilicon. One firm (***) reported producing products other than silicon metal during 2017-19 and January to March 2020. The overall capacity of U.S. producers decreased by *** percent during 2017-19 and was lower by *** percent during interim 2020 than in interim 2019. Production of silicon metal decreased by 28.1 percent during 2017-19, and it was higher by 11.6 percent during interim 2020. Production of ferrosilicon increased by *** from 2017-2019, but was lower in interim 2020 than in interim 2019. Production of magnesium ferrosilicon (which accounts for all other products) increased from *** in 2017 to *** during 2019, but was lower during interim 2020 than during interim 2019. The overall capacity utilization decreased by 3.9 percentage points during 2017-19, and was lower by 1.3 percentage points during interim 2020 than in interim 2019. Overall, out-of-scope production was lower in interim 2020 by 21.3 percentage points than during interim 2019 and accounted for 3.1 percent of overall production during interim 2020.

Table III-5
Silicon metal: U.S. producers' overall plant capacity and production on the same equipment as subject production, 2017-19, January-March 2019, and January-March 2020

*	*	*	*	*	*	*

U.S. producers' U.S. shipments and exports

Table III-6 presents U.S. producers' U.S. shipments, export shipments, and total shipments. From 2017-19, the quantity of U.S. producers' U.S. shipments decreased by *** percent, while the value decreased by *** percent. U.S. producers' U.S. shipments quantities were higher during interim 2020 than during interim 2019 by *** percent, and were lower by *** percent by value. The unit values of U.S. producers' U.S. shipments increased by *** percent during 2017-19, but were lower by *** percent during interim 2020 than during interim 2019. Transfers to related firms decreased by *** percent during 2017-19, and were lower by *** percent during interim 2020 than in interim 2019. Transfers to related firms accounted for approximately *** percent of total shipments during 2017, but were higher during 2019, accounting for approximately *** percent of total shipments. *** accounted for the majority of transfers to related firms during 2019, while *** accounted for the majority during 2018. Export shipments accounted for *** of total shipments during 2017-19 and the January-March interim periods. U.S. producers' unit values for commercial shipments, transfers to related firms, total U.S. shipments, export shipments, and total shipments all increased during 2017-19, but the unit values for total shipments were lower during interim 2020 than in interim 2019.

Table III-6
Silicon metal: U.S. producers' U.S. shipments, exports shipments, and total shipments, 2017-19, January-March 2019, January-March 2020

Item	Calendar year			January to March	
	2017	2018	2019	2019	2020
	Quantity (short tons contained silicon)				
Commercial U.S. shipments	***	***	***	***	***
Transfers to related firms	***	***	***	***	***
U.S. shipments	188,981	185,493	145,692	42,786	43,737
Export shipments	***	***	***	***	***
Total shipments	***	***	***	***	***
	Value (1,000 dollars)				
Commercial U.S. shipments	***	***	***	***	***
Transfers to related firms	***	***	***	***	***
U.S. shipments	426,195	489,533	346,753	105,538	99,700
Export shipments	***	***	***	***	***
Total shipments	***	***	***	***	***
	Unit value (dollars per STCS)				
Commercial U.S. shipments	***	***	***	***	***
Transfers to related firms	***	***	***	***	***
U.S. shipments	2,255	2,639	2,380	2,467	2,280
Export shipments	***	***	***	***	***
Total shipments	***	***	***	***	***
	Share of quantity (percent)				
Commercial U.S. shipments	***	***	***	***	***
Transfers to related firms	***	***	***	***	***
U.S. shipments	99.9	100.0	99.9	99.9	100.0
Export shipments	***	***	***	***	***
Total shipments	***	***	***	***	***
	Share of value (percent)				
Commercial U.S. shipments	***	***	***	***	***
Transfers to related firms	***	***	***	***	***
U.S. shipments	100.0	100.0	100.0	100.0	100.0
Export shipments	***	***	***	***	***
Total shipments	***	***	***	***	***
	Narrative				
*** description of transfers	***				

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

U.S. producers' inventories

Table III-7 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 2017-19, January to March 2019, and January to March 2020**.** During 2017-19, end-of-period inventories decreased by *** percent, and were lower by *** percent during interim 2020 than in interim 2019. *** maintained the highest inventories during each year and during the interim periods.

Table III-7
Silicon metal: U.S. producers' inventories, 2017-19, January-March 2019 and January-March 2020

* * * * * * *

U.S. producers' imports and purchases

U.S. producers' imports and purchases of silicon metal are presented in table III-8. As presented in table III-8, one U.S. producer *** directly imports nonsubject merchandise and one U.S. producer (***) purchased nonsubject merchandise from U.S. importers. *** imported silicon metal exclusively from nonsubject sources, while ***. *** imports of silicon metal were greater than its production from 2017-19 and during the interim periods January-March 2019 and 2020. *** imported silicon metal from nonsubject sources, almost exclusively from Brazil. *** ratio of imports to production decreased during 2017-19, and it was lower during interim 2020 compared to interim 2019. During interim 2020, *** imports to production ratio was ***.

Table III-8
Silicon metal: U.S. producers' U.S. production, imports and purchases, 2017-19, January-March 2019, and January-March 2020

* * * * * * *

U.S. employment, wages, and productivity

Table III-9 shows U.S. producers' employment-related data. U.S. producers' employment measured by production and related workers (PRWs) decreased by 16.6 percent during 2017-19, but was higher by 7.7 percent during interim 2020 than in interim 2019. U.S. producers' total hours worked decreased by 17.6 percent during 2017-19, but were higher by 9.5 percent during interim 2020 than during interim 2019. U.S. producers' hourly wages increased by 2.4 percent during 2017-19, but were lower by 1.1 percent during interim 2020 than during interim 2019. U.S. producers' productivity decreased by 12.7 percent during 2017-19, but was 2.0 percent higher during interim 2020 than in interim 2019. Unit labor costs increased by 17.3 percent during 2017-19, but were 3.0 percent lower in interim 2020 than in interim 2019.

Table III-9
Silicon metal: Average number of production and related workers, hours worked, wages paid to such employees, hourly wages, productivity, and unit labor costs, 2017-19, January-March 2019, January-March 2020

Item	Calendar year			January to March	
	2017	2018	2019	2019	2020
Production and related workers (PRWs) (number)	664	739	554	549	591
Total hours worked (1,000 hours)	1,448	1,632	1,193	295	323
Hours worked per PRW (hours)	2,181	2,208	2,153	537	547
Wages paid ($1,000)	41,007	46,193	34,590	8,417	9,119
Hourly wages (dollars per hour)	$28.32	$28.30	$28.99	$28.53	$28.23
Productivity (short tons contained silicon per 1,000 hours)	134.0	115.2	116.9	127.3	129.9
Unit labor costs (dollars per short tons contained silicon)	$211	$246	$248	$224	$217

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

Part IV: U.S. imports, apparent U.S. consumption, and market shares

U.S. importers

The Commission issued importer questionnaires to 35 firms believed to be importers of subject silicon metal, as well as to all U.S. producers of silicon metal.[1] Usable questionnaire responses were received from 17 companies, representing *** of U.S. imports from Bosnia and Herzegovina, *** percent of U.S. imports from Iceland, *** percent of U.S. imports from Kazakhstan, and *** percent of U.S. imports from Malaysia for 2019 under HTS statistical reporting numbers 2804.69.1000 and 2804.69.5000.[2] That is, the 17 questionnaire responses represented *** percent of U.S. imports from the combined subject sources, *** percent of U.S. imports from nonsubject sources, and *** percent from all import sources, during 2019. As is generally consistent across previous and related Commission silicon proceedings, public official Commerce statistics are presented throughout this report (as opposed to country-specific confidential questionnaire responses), unless specifically indicated otherwise.[3] Table IV-1 lists all responding U.S. importers of silicon metal from Bosnia and Herzegovina, Iceland, Kazakhstan, Malaysia, and other sources, their locations, and their shares of U.S. imports, in 2019.

[1] The Commission issued questionnaires to those firms identified in the petitions, may have accounted for more than one percent of total imports under HTS statistical reporting numbers 2804.69.1000 and 2804.69.5000 in 2019.

[2] The coverage estimates presented are calculated from official U.S. import statistics based on General Imports. General Imports measure 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.

[3] U.S. import statistics presented in this report are based on General U.S. imports (as opposed to imports for consumption) due to issues with country of origin reporting and product classification reporting that result from certain U.S. importers' use of foreign trade zones (FTZs) for their importation of silicon metal. Since U.S. import statistics are presented on the basis of General U.S. Imports, values are reported on a CIF basis as opposed to a LDPV basis.

Table IV-1
Silicon metal: U.S. importers, their headquarters, and share of total imports by source, 2019

Firm	Headquarters	Share of imports by source (percent)			
		Bosnia-Herzegovina	Iceland	Kazakhstan	Malaysia
BIT Metals	Amstelveen, Netherlands	***	***	***	***
CCMA	Amherst, NY	***	***	***	***
Dow	Midland, MI	***	***	***	***
Elkem	Moon Township, PA	***	***	***	***
Greenwich	Greenwich, CT	***	***	***	***
Grupo FerroAtlántica	Madrid, Spain	***	***	***	***
Laurand	Boca Raton, FL	***	***	***	***
Momentive Performance Materials	Waterford, NY	***	***	***	***
MPSAC	Theodore, AL	***	***	***	***
MTALX	London, England	***	***	***	***
NI-MET Metals	West Palm Beach, FL	***	***	***	***
Polymet	Birmingham, AL	***	***	***	***
REC	Moses Lake, WA	***	***	***	***
Simcoa	Wellesley, Western Australia	***	***	***	***
Standard Resources	Cherry Hill, NJ	***	***	***	***
Tennant	Chesterfield U.K.	***	***	***	***
WPNA	Charleston, TN	***	***	***	***
All firms		***	***	***	***

Table continued on next page.

Table IV-1--Continued
Silicon metal: U.S. importers, their headquarters, and share of total imports by source, 2019

Firm	Headquarters	Share of imports by source (percent)		
		Subject sources	Nonsubject sources	All import sources
BIT Metals	Amstelveen, Netherlands	***	***	***
CCMA	Amherst, NY	***	***	***
Dow	Midland, MI	***	***	***
Elkem	Moon Township, PA	***	***	***
Greenwich	Greenwich, CT	***	***	***
Grupo FerroAtlántica	Madrid, Spain,	***	***	***
Laurand	Boca Raton, FL	***	***	***
Momentive Performance Materials	Waterford, NY	***	***	***
MPSAC	Theodore, AL	***	***	***
MTALX	London, N/	***	***	***
NI-MET Metals	West Palm Beach, FL	***	***	***
Polymet	Birmingham, AL	***	***	***
REC	Moses Lake, WA	***	***	***
Simcoa	Wellesley, Western Australia, WA	***	***	***
Standard Resources	Cherry Hill, NJ	***	***	***
Tennant	Chesterfield Uk,	***	***	***
WPNA	Charleston, TN	***	***	***
All firms		***	***	***

Note.--Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent.

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

U.S. imports

Table IV-2 and figure IV-1 present data for U.S. imports of silicon metal from Bosnia and Herzegovina, Iceland, Kazakhstan, Malaysia and all other sources. The quantity of silicon metal imports from the subject countries decreased by 28.8 percent from 2017 to 2018, but increased by 118.7 percent from 2018 to 2019. The quantity of silicon metal imports from the subject countries increased overall by 55.8 percent during 2017-19, but was lower in January to March ("interim") 2020 than in interim 2019 by 11.1 percent. The value of silicon metal imports from the subject countries increased by 53.2 percent from 2017 to 2019, but was lower in interim 2020 than in interim 2019 by 31.1 percent. As a share of total imports, subject imports (based on quantity) decreased from 11.2 percent in 2017 to 10.3 percent in 2018, but increased to 19.1 percent in 2019. The average unit values of silicon metal imports from the subject countries, which were lower than those reported for nonsubject imports in 2017-19 but

decreased by 1.6 percent during the same period (2017-19). The average unit values of silicon metal imports from the subject countries were lower by 22.5 percent in interim 2020 than in interim 2019.

The quantity of silicon metal imports from all nonsubject countries decreased by 17.2 percent from 2017 to 2019, and was 35.0 percent lower in interim 2020 than in interim 2019. The CIF value of silicon metal imports from all nonsubject countries followed a similar trend, decreasing by 10.2 percent from 2017 to 2019, and was 44.4 percent lower in interim 2020 than in interim 2019. The average unit value of silicon metal imports from nonsubject countries increased by 8.4 percent during 2017-19, but was 14.5 percent lower in interim 2020 than in interim 2020.

The ratio of subject import volume to U.S. production increased from *** percent in 2017 to *** percent in 2019. The ratio was *** percent in interim 2019 and *** percent in interim 2019.

The ratio of nonsubject import volume to U.S. production increased from *** percent in 2017 to *** in 2019, but was lower at *** percent in interim 2020 than it was in interim 2019 at *** percent.

The ratio of total import volume to U.S. production increased from *** percent in 2017 to *** in 2019, but was lower at *** percent in interim 2020 than it was in interim 2019 at *** percent.

Table IV-2
Silicon metal: U.S. imports by source, 2017-19, January-March 2019, and January-March 2020

Item	Calendar year			January to March	
	2017	2018	2019	2019	2020
	Quantity (short tons contained silicon)				
U.S. imports from.--					
Bosnia-Herzegovina	7,211	9,350	10,493	3,237	2,818
Iceland	1,471	1,259	6,947	1,798	1,519
Kazakhstan	10,360	3,045	8,522	2,378	345
Malaysia	125	---	3,894	---	1,905
Subject sources	19,166	13,654	29,857	7,413	6,586
Nonsubject sources	152,344	118,966	126,190	37,937	24,671
All import sources	171,511	132,620	156,047	45,350	31,257
	Value (1,000 dollars)				
U.S. imports from.--					
Bosnia-Herzegovina	14,897	21,653	20,079	6,655	4,447
Iceland	2,413	2,369	11,711	3,278	2,221
Kazakhstan	17,466	6,064	15,171	4,487	518
Malaysia	179	---	6,595	---	2,743
Subject sources	34,955	30,086	53,556	14,420	9,930
Nonsubject sources	335,793	315,333	301,596	94,360	52,438
All import sources	370,748	345,419	355,152	108,781	62,368
	Unit value (dollars per STCS)				
U.S. imports from.--					
Bosnia-Herzegovina	2,066	2,316	1,913	2,056	1,578
Iceland	1,641	1,882	1,686	1,824	1,463
Kazakhstan	1,686	1,991	1,780	1,887	1,504
Malaysia	1,430	---	1,693	---	1,440
Subject sources	1,824	2,203	1,794	1,945	1,508
Nonsubject sources	2,204	2,651	2,390	2,487	2,126
All import sources	2,162	2,605	2,276	2,399	1,995

Table continued on next page.

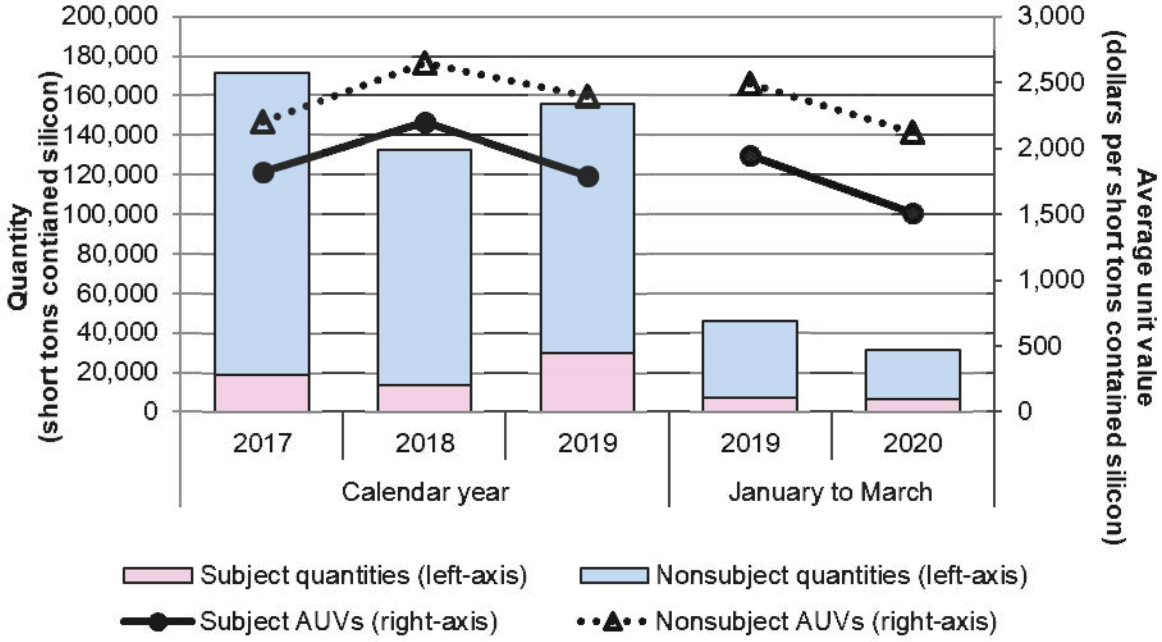
Table IV-2--Continued
Silicon metal: U.S. imports by source, 2017-19, January-March 2019, and January-March 2020

Item	Calendar year			January to March	
	2017	2018	2019	2019	2020
	Share of quantity (percent)				
U.S. imports from.--					
Bosnia-Herzegovina	4.2	7.0	6.7	7.1	9.0
Iceland	0.9	0.9	4.5	4.0	4.9
Kazakhstan	6.0	2.3	5.5	5.2	1.1
Malaysia	0.1	---	2.5	---	6.1
Subject sources	11.2	10.3	19.1	16.3	21.1
Nonsubject sources	88.8	89.7	80.9	83.7	78.9
All import sources	100.0	100.0	100.0	100.0	100.0
	Share of value (percent)				
U.S. imports from.--					
Bosnia-Herzegovina	4.0	6.3	5.7	6.1	7.1
Iceland	0.7	0.7	3.3	3.0	3.6
Kazakhstan	4.7	1.8	4.3	4.1	0.8
Malaysia	0.0	---	1.9	---	4.4
Subject sources	9.4	8.7	15.1	13.3	15.9
Nonsubject sources	90.6	91.3	84.9	86.7	84.1
All import sources	100.0	100.0	100.0	100.0	100.0
	Ratio to U.S. production				
U.S. imports from.--					
Bosnia-Herzegovina	***	***	***	***	***
Iceland	***	***	***	***	***
Kazakhstan	***	***	***	***	***
Malaysia	***	***	***	***	***
Subject sources	***	***	***	***	***
Nonsubject sources	***	***	***	***	***
All import sources	***	***	***	***	***

Note.--Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. STCS-Short tons contained silicon. U.S. imports based on general imports. Value of imports based on CIF value (customs value plus insurance and freight).

Source: Compiled from data submitted in response to Commission questionnaires and official U.S. import statistics based on General Imports using HTS statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed July 21, 2020.

Figure IV-1
Silicon metal: U.S. imports by source, 2017-19, January-March 2019, and January-March 2020



Source: Compiled from data submitted in response to Commission questionnaires and official U.S. import statistics based on General Imports using HTS statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed July 21, 2020.

Nonsubject imports

Table IV-3 presents data for U.S. imports of silicon metal from nonsubject sources and from all sources that were previously investigated, that were more recently investigated, and that are currently under order. Imports of silicon metal from Argentina were previously investigated (along with Brazil and China) in 1990. Imports of silicon metal from China and Russia are currently under, and the full, five-year reviews were completed in 2018 and 2020, respectively. In 2019, the combined total imports of silicon metal from China and Russia were 207 short tons. Based on official import statistics, the imports of silicon metal from Australia, Brazil, and Norway were recently investigated and their combined imports accounted for 83,211 short tons of silicon metal during 2019. As a share of quantity, the combined imports from Australia, Brazil, and Norway accounted for 53.3 percent of all imports of silicon metal during 2019. Canada, Laos, and Thailand additionally are nonsubject sources of imports of silicon metal, and they accounted for a combined 26.1 percent of all imports of silicon metal during 2019.

The quantity of silicon metal imports from previously investigated all sources of silicon metal imports decreased by 30.6 percent from 2017 to 2018, but increased by 18.6 percent

from 2018 to 2019. The quantity of silicon metal imports from all sources that were previously investigated decreased overall by 17.6 percent during 2017-19, but was lower in January to March ("interim") 2020 than in interim 2019 by 30.3 percent. The value of silicon metal imports from all sources that were previously investigated decreased by 11.2 percent from 2017 to 2019, and were lower in interim 2020 than in interim 2019 by 40.7 percent. As a share of total imports, imports of all sources that were previously investigated, based on quantity, decreased by 7.7 percentage points during 2017-19, but was higher by 0.9 percentage points during interim 2020 than in interim 2019. The average unit values of silicon metal imports from all sources that were previously investigated increased by 7.8 percent during 2017-19 but were lower by 14.9 percent during interim 2020 than in interim 2019. As a share of total imports, imports of all sources that were previously investigated, based on value, decreased by 6.1 percentage points during 2017-19.

Table IV-3
Silicon metal: U.S. imports by nonsubject source, 2017-19, January-March 2019, and January-March 2020

Item	Calendar year			January to March	
	2017	2018	2019	2019	2020
	Quantity (short tons contained silicon)				
U.S. imports from nonsubject sources.--					
Argentina	---	---	---	---	---
Australia	20,780	4,344	7,405	2,879	1,839
Brazil	77,579	40,764	57,067	17,071	14,161
China	259	221	207	25	87
Norway	15,292	21,358	18,532	6,239	3,456
Russia	---	---	---	---	---
All sources previously investigated	113,909	66,687	83,211	26,214	19,543
Of which, recently previously investigated	113,650	66,466	83,004	26,189	19,455
Of which, currently under order	259	221	207	25	87
Canada	25,188	29,914	31,371	7,847	4,197
Laos	808	2,712	3,226	1,200	393
Thailand	8,656	18,439	6,125	2,235	---
All other sources	3,783	1,213	2,256	440	538
Nonsubject sources	152,344	118,966	126,190	37,937	24,671
	Value (1,000 dollars)				
U.S. imports from nonsubject sources.--					
Argentina	---	---	---	---	---
Australia	41,366	11,163	17,208	7,419	3,717
Brazil	177,842	107,071	137,708	43,328	30,689
China	378	334	275	34	96
Norway	29,146	55,104	41,340	13,959	6,877
Russia	---	---	---	---	---
All sources previously investigated	248,732	173,672	196,531	64,741	41,380
Of which, recently previously investigated	248,354	173,338	196,257	64,706	41,284
Of which, currently under order	378	334	275	34	96
Canada	60,356	82,733	78,039	20,729	9,343
Laos	1,756	6,484	8,207	2,797	820
Thailand	18,397	50,536	14,329	5,176	---
All other sources	6,553	1,907	4,490	918	895
Nonsubject sources	335,793	315,333	301,596	94,360	52,438

Table continued on next page.

Table IV-3--Continued
Silicon metal: U.S. imports by nonsubject source, 2017-19, January-March 2019, and January-March 2020

Item	Calendar year			January to March	
	2017	2018	2019	2019	2020
	Unit value (dollars per STCS)				
U.S. imports from nonsubject sources.--					
Argentina	---	---	---	---	---
Australia	1,991	2,570	2,324	2,577	2,021
Brazil	2,292	2,627	2,413	2,538	2,167
China	1,460	1,514	1,325	1,370	1,093
Norway	1,906	2,580	2,231	2,238	1,990
Russia	---	---	---	---	---
All sources previously investigated	2,184	2,604	2,362	2,470	2,117
Of which, recently previously investigated	2,185	2,608	2,364	2,471	2,122
Of which, currently under order	1,460	1,514	1,325	1,370	1,093
Canada	2,396	2,766	2,488	2,642	2,226
Laos	2,173	2,391	2,544	2,330	2,088
Thailand	2,125	2,741	2,339	2,316	---
All other sources	1,732	1,572	1,990	2,087	1,664
Nonsubject sources	2,204	2,651	2,390	2,487	2,126
	Share of quantity (percent)				
U.S. imports from nonsubject sources.--					
Argentina	---	---	---	---	---
Australia	12.1	3.3	4.7	6.3	5.9
Brazil	45.2	30.7	36.6	37.6	45.3
China	0.2	0.2	0.1	0.1	0.3
Norway	8.9	16.1	11.9	13.8	11.1
Russia	---	---	---	---	---
All sources previously investigated	66.4	50.3	53.3	57.8	62.5
Of which, recently previously investigated	66.3	50.1	53.2	57.7	62.2
Of which, currently under order	0.2	0.2	0.1	0.1	0.3
Canada	14.7	22.6	20.1	17.3	13.4
Laos	0.5	2.0	2.1	2.6	1.3
Thailand	5.0	13.9	3.9	4.9	---
All other sources	2.2	0.9	1.4	1.0	1.7
Nonsubject sources	88.8	89.7	80.9	83.7	78.9

Table continued on the next page.

Table IV-3--Continued
Silicon metal: U.S. imports by nonsubject source, 2017-19, January-March 2019, and January-March 2020

Item	Calendar year			January to March	
	2017	2018	2019	2019	2020
	Share of value (percent)				
U.S. imports from nonsubject sources.--					
Argentina	---	---	---	---	---
Australia	11.2	3.2	4.8	6.8	6.0
Brazil	48.0	31.0	38.8	39.8	49.2
China	0.1	0.1	0.1	0.0	0.2
Norway	7.9	16.0	11.6	12.8	11.0
Russia	---	---	---	---	---
All sources previously investigated	67.1	50.3	55.3	59.5	66.3
Of which, recently previously investigated	67.0	50.2	55.3	59.5	66.2
Of which, currently under order	0.1	0.1	0.1	0.0	0.2
Canada	16.3	24.0	22.0	19.1	15.0
Laos	0.5	1.9	2.3	2.6	1.3
Thailand	5.0	14.6	4.0	4.8	---
All other sources	1.8	0.6	1.3	0.8	1.4
Nonsubject sources	90.6	91.3	84.9	86.7	84.1

Note.--Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. STCS-Short tons contained silicon. U.S. imports based on general imports.

Source: Official U.S. import statistics based on General Imports using HTS statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed July 21, 2020.

Negligibility

The statute requires that an investigation be terminated without an injury determination if imports of the subject merchandise are found to be negligible.[4] Negligible imports are generally defined in the Act, as amended, as imports from a country of merchandise corresponding to a domestic like product where such imports account for less than 3 percent of the volume of all such merchandise imported into the United States in the most recent 12-month period for which data are available that precedes the filing of the petition or the initiation of the investigation. However, if there are imports of such merchandise from a number of countries subject to investigations initiated on the same day that individually account for less than 3 percent of the total volume of the subject merchandise, and if the imports from those countries collectively account for more than 7 percent of the volume of all such merchandise imported into the United States during the applicable 12-month period, then

[4] 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 such countries are deemed not to be negligible.[5] Table IV-4 presents data on U.S. imports of silicon metal in the twelve months preceding the filing of the petitions (June 2019-May 2020). Imports from Bosnia and Herzegovina, Iceland, Kazakhstan, and Malaysia collectively accounted for 20.3 percent of total imports by quantity during June 2019 through May 2020.

Table IV-4
Silicon metal: U.S. imports in the twelve-month period preceding the filing of the petition, June 2019 through May 2020

Item	June 2019 through May 2020	
	Quantity (short tons contained silicon)	Share quantity (percent)
U.S. imports from.--		
Bosnia-Herzegovina	9,609	7.3
Iceland	5,455	4.2
Kazakhstan	3,966	3.03
Malaysia	7,577	5.8
Subject sources	26,607	20.3
Nonsubject sources	104,188	79.7
All import sources	130,796	100.0

Note.--Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent.

Source: Official U.S. import statistics based on General Imports using HTS statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed July 21, 2020.

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 distribution, and (4) simultaneous presence in the market. Information regarding channels of distribution, market areas, and interchangeability appear in Part II. Additional information concerning fungibility, geographical markets, and simultaneous presence in the market is presented below.

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

Fungibility

The Commission requested information concerning U.S. producers' and U.S. importers' U.S. shipments of silicon metal, by grade, for calendar year 2019. These data are presented in table IV-5 and figure IV-2.

U.S. producers' U.S. shipments of metallurgical grade silicon metal accounted for *** percent of total U.S. producer commercial shipments. Metallurgical silicon metal accounted for the largest share of reported U.S. shipments for U.S. producers and for U.S. importers' U.S. shipments from both subject and nonsubject sources (which combined accounted for *** percent of total U.S. commercial shipments). In 2019, ***.[6]

[6] *** U.S. importer questionnaire, section II-4.

Table IV-5
Silicon metal: U.S. producers' and U.S. importers' U.S. shipments by grade, 2019

Source	High purity grade	Metallurgical grade	All grades
	Quantity (short tons contained silicon)		
U.S. producers' U.S. shipments	***	***	***
U.S. importers' U.S. shipments.-- Bosnia-Herzegovina	***	***	***
Iceland	***	***	***
Kazakhstan	***	***	***
Malaysia	***	***	***
Subject sources	***	***	***
Nonsubject sources	***	***	***
All import sources	***	***	***
U.S. producers' and U.S. importers' U.S. shipments	***	***	***
	Ratio across (percent)		
U.S. producers' U.S. shipments	***	***	***
U.S. importers' U.S. shipments.-- Bosnia-Herzegovina	***	***	***
Iceland	***	***	***
Kazakhstan	***	***	***
Malaysia	***	***	***
Subject sources	***	***	***
Nonsubject sources	***	***	***
All import sources	***	***	***
U.S. producers' and U.S. importers' U.S. shipments	***	***	***
	Ratio down (percent)		
U.S. producers' U.S. shipments	***	***	***
U.S. importers' U.S. shipments.-- Bosnia-Herzegovina	***	***	***
Iceland	***	***	***
Kazakhstan	***	***	***
Malaysia	***	***	***
Subject sources	***	***	***
Nonsubject sources	***	***	***
All import sources	***	***	***
U.S. producers' and U.S. importers' U.S. shipments	***	***	***

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

Figure IV-2
Silicon metal: U.S. producers' and U.S. importers' U.S. shipments by grade, 2019

* * * * * * *

Geographical markets

Silicon metal produced in the United States is shipped nationwide.[7] In 2019, official import statistics show that 94.4 percent of subject imports entered through the Eastern border of entry of the United States, followed by the Western, Southern, and Northern borders of entry with 4.9, 0.7, and 0.0 percent, respectively. In 2019, nonsubject imports accounted for 40.0 percent of imports of silicon metal that entered the United States through the Eastern border with the largest amount of silicon metal by quantity at 50,000 short tons. Table IV-6 presents U.S. import quantities of silicon metal sources and border of entry during 2019.[8]

[7] See Part II for additional information on geographic markets.

[8] The "East" border of entry includes the following Customs entry districts for silicon metal: Baltimore, MD; Charleston, SC; Charlotte, NC; New York, NY; Norfolk, VA; Ogdensburg, NY; Philadelphia, PA; Savannah, GA; and St. Albans, VT. The "North" border of entry includes the following Customs entry districts for silicon metal: Chicago, IL; Cleveland, OH; Detroit, MI; Great Falls, MT; Minneapolis, MN; and St. Louis, MO. The "South" border of entry includes the following Customs entry districts for silicon metal: Dallas-Fort Worth, TX; Houston-Galveston, TX; Miami, FL; New Orleans, LA; and Tampa, FL. The "West" border of entry includes the following Customs entry districts for silicon metal: Los Angeles, CA; San Francisco, CA; and Seattle, WA.

Table IV-6
Silicon metal: U.S. imports by border of entry, 2019

Item	Border of entry				
	East	North	South	West	All borders
	Quantity (short tons contained silicon)				
U.S. imports from.--					
Bosnia-Herzegovina	9,746	---	---	748	10,493
Iceland	6,662	---	---	284	6,947
Kazakhstan	8,304	---	219	---	8,522
Malaysia	3,459	---	---	435	3,894
Subject sources	28,171	---	219	1,467	29,857
Nonsubject sources	50,457	35,808	28,522	11,403	126,190
All import sources	78,628	35,808	28,741	12,870	156,047
	Share across (percent)				
U.S. imports from.--					
Bosnia-Herzegovina	92.9	---	---	7.1	100.0
Iceland	95.9	---	---	4.1	100.0
Kazakhstan	97.4	---	2.6	---	100.0
Malaysia	88.8	---	---	11.2	100.0
Subject sources	94.4	---	0.7	4.9	100.0
Nonsubject sources	40.0	28.4	22.6	9.0	100.0
All import sources	50.4	22.9	18.4	8.2	100.0
	Share down (percent)				
U.S. imports from.--					
Bosnia-Herzegovina	12.4	---	---	5.8	6.7
Iceland	8.5	---	---	2.2	4.5
Kazakhstan	10.6	---	0.8	---	5.5
Malaysia	4.4	---	---	3.4	2.5
Subject sources	35.8	---	0.8	11.4	19.1
Nonsubject sources	64.2	100.0	99.2	88.6	80.9
All import sources	100.0	100.0	100.0	100.0	100.0

Note.--Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent.

Source: Official U.S. import statistics based on General Imports using HTS statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed July 21, 2020.

Presence in the market

Table IV-7 and figures IV-3 and IV-4 present monthly official U.S. import statistics for subject countries and nonsubject sources. The monthly import statistics indicate that U.S. imports of silicon metal from two of the subject countries, Bosnia and Herzegovina and Iceland, were present in nearly each month during January 2017 to March 2020. Imports from Bosnia and Herzegovina were present for 37 months of the 39 month period. Imports from Iceland were present for 30 months of the 39 month period, while imports from Kazakhstan were present for 28 months of the 39 month period.

Table IV-7
Silicon metal: U.S. imports by month, January 2017 through March 2020

U.S. imports	Bosnia-Herzegovina	Iceland	Kazakhstan	Malaysia	Subject sources	Non subject sources	All import sources
	Quantity (short tons contained silicon)						
2017.--							
January	331	---	925	125	1,381	12,375	13,756
February	222	104	1,358	---	1,683	11,061	12,745
March	210	---	858	---	1,068	13,563	14,631
April	---	52	285	---	337	13,311	13,648
May	315	261	1,277	---	1,852	12,547	14,399
June	---	340	2,985	---	3,326	11,690	15,016
July	157	---	1,912	---	2,070	16,169	18,239
August	307	---	759	---	1,066	18,292	19,358
September	153	229	---	---	382	10,890	11,272
October	1,207	314	---	---	1,521	7,496	9,017
November	1,916	105	---	---	2,021	14,570	16,591
December	2,394	65	---	---	2,459	10,380	12,839
2018.--							
January	920	106	---	---	1,026	8,339	9,365
February	1,472	22	---	---	1,494	9,642	11,136
March	1,146	---	---	---	1,146	11,512	12,659
April	450	---	---	---	450	10,090	10,540
May	645	---	130	---	775	18,522	19,297
June	1,483	109	424	---	2,017	7,474	9,491
July	294	---	553	---	847	9,012	9,859
August	536	---	692	---	1,228	8,398	9,626
September	154	324	279	---	757	8,358	9,115
October	702	128	74	---	905	9,681	10,585
November	144	241	455	---	840	7,217	8,058
December	1,403	329	437	---	2,169	10,720	12,889

Table continued on next page.

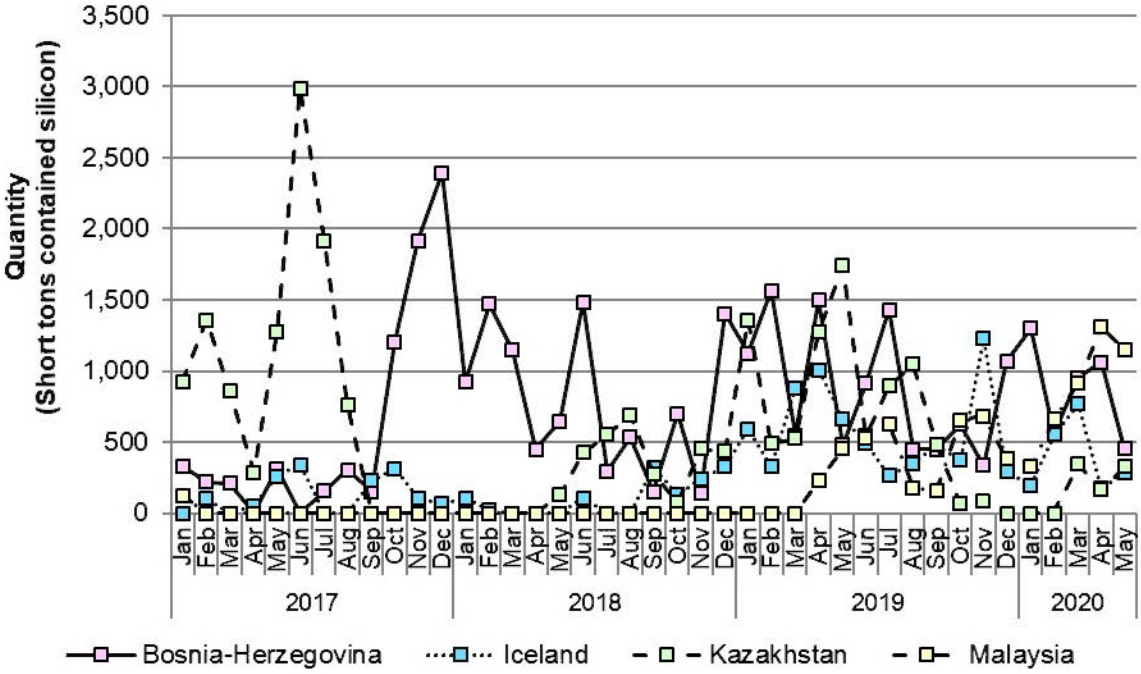
Table IV-7--Continued
Silicon metal: U.S. imports by month, January 2017 through March 2020

U.S. imports	Bosnia-Herzegovina	Iceland	Kazakhstan	Malaysia	Subject sources	Nonsubject sources	All import sources
	Quantity (short tons contained silicon)						
2019.--							
January	1,124	591	1,360	---	3,075	12,156	15,230
February	1,564	328	491	---	2,383	8,515	10,898
March	549	879	527	---	1,955	17,266	19,221
April	1,499	1,007	1,273	230	4,009	13,710	17,719
May	481	667	1,742	455	3,345	9,972	13,318
June	913	494	546	524	2,476	10,100	12,576
July	1,430	263	895	630	3,217	9,706	12,923
August	451	348	1,048	179	2,026	8,100	10,126
September	449	480	487	156	1,573	9,526	11,099
October	624	372	66	657	1,719	10,039	11,758
November	337	1,228	87	682	2,335	8,043	10,378
December	1,072	290	---	382	1,744	9,058	10,801
2020.--							
January	1,301	197	---	330	1,828	10,732	12,560
February	563	551	---	659	1,773	5,989	7,761
March	954	770	345	917	2,985	7,951	10,936
April	1,059	176	164	1,310	2,709	7,624	10,333
May	455	285	329	1,152	2,222	7,323	9,545

Note.--Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent.

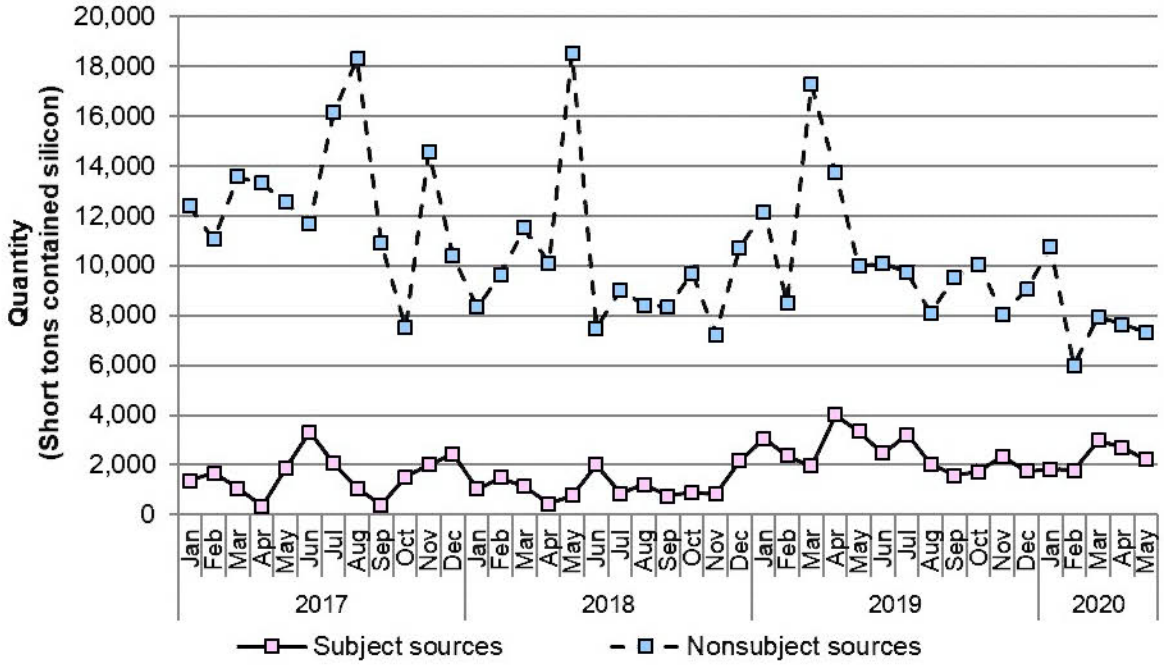
Source: Official U.S. import statistics based on General Imports using HTS statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed July 21, 2020.

Figure IV-3
Silicon metal: U.S. imports from individual subject sources, January 2017 through March 2020



Source: Official U.S. import statistics based on General Imports using HTS statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed July 21, 2020.

Figure IV-4
Silicon metal: U.S. imports from aggregated subject and nonsubject sources, January 2017 through March 2020



Source: Official U.S. import statistics based on General Imports using HTS statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed July 21, 2020.

Apparent U.S. consumption

Table IV-8 and figure IV-5 present data on apparent U.S. consumption for silicon metal during 2017-19, January-March 2019, and January-March 2020 ("interim periods"). During 2017-19, U.S. apparent consumption, based on quantity decreased by 16.3 percent, and was lower by 14.9 percent during interim 2020 than in interim 2019. During 2017-19, U.S. apparent consumption, based on value, decreased by 11.9 percent, and was lower by 24.4 percent during interim 2020 than in interim 2019.

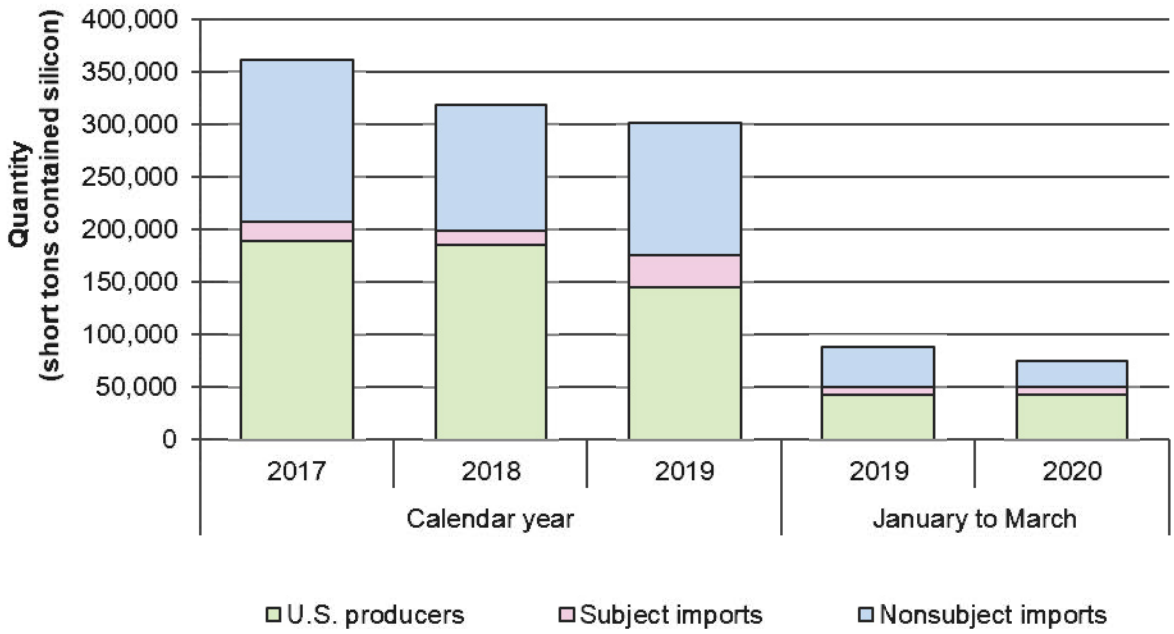
Table IV-8
Silicon metal: Apparent U.S. consumption, 2017-19, January-March 2019, and January-March 2020

Item	Calendar year			January to March	
	2017	2018	2019	2019	2020
	Quantity (short tons contained silicon)				
U.S. producers' U.S. shipments	188,981	185,493	145,692	42,786	43,737
U.S. importers' U.S. imports from.--					
Bosnia-Herzegovina	7,211	9,350	10,493	3,237	2,818
Iceland	1,471	1,259	6,947	1,798	1,519
Kazakhstan	10,360	3,045	8,522	2,378	345
Malaysia	125	---	3,894	---	1,905
Subject sources	19,166	13,654	29,857	7,413	6,586
Nonsubject sources	152,344	118,966	126,190	37,937	24,671
All import sources	171,511	132,620	156,047	45,350	31,257
Apparent U.S. consumption	360,492	318,113	301,739	88,136	74,994
	Value (1,000 dollars)				
U.S. producers' U.S. shipments	426,195	489,533	346,753	105,538	99,700
U.S. importers' U.S. imports from.--					
Bosnia-Herzegovina	14,897	21,653	20,079	6,655	4,447
Iceland	2,413	2,369	11,711	3,278	2,221
Kazakhstan	17,466	6,064	15,171	4,487	518
Malaysia	179	---	6,595	---	2,743
Subject sources	34,955	30,086	53,556	14,420	9,930
Nonsubject sources	335,793	315,333	301,596	94,360	52,438
All import sources	370,748	345,419	355,152	108,781	62,368
Apparent U.S. consumption	796,943	834,952	701,905	214,319	162,068

Note.--Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent.

Source: Compiled from data submitted in response to Commission questionnaires and official U.S. import statistics based on General Imports using HTS statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed July 21, 2020.

Figure IV-5
Silicon metal: Apparent U.S. consumption, 2017-19, January-March 2019, and January-March 2020



Source: Compiled from data submitted in response to Commission questionnaires and official U.S. import statistics based on General Imports using HTS statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed July 21, 2020.

U.S. market shares

U.S. market share data are presented in table IV-10. U.S. producers' share of apparent U.S. consumption by quantity, increased from 52.4 percent in 2017 to 58.3 percent in 2018 before decreasing to 48.3 percent in 2019 with an overall decrease of 4.1 percentage points during 2017-19, but was higher by 9.8 percentage points during interim 2020 than in interim 2019. U.S. producers' share of apparent U.S. consumption by value, increased from 53.5 percent in 2017 to 58.6 percent in 2018, but decreased to 49.4 percent in 2019, with an overall decrease of 4.1 percentage points during 2017-19, but was higher by 12.3 percentage points during interim 2020 than in interim 2019. Subject imports' share of the U.S. market by quantity increased from 5.3 percent in 2017 to 9.9 percent in 2019, and was higher by 0.4 percentage points during interim 2020 than in interim 2019. Subject imports' share of the U.S. market by value, increased from 4.4 percent in 2017 to 7.6 percent in 2019, but was lower by 0.6 percentage points during interim 2020 than in interim 2019. Meanwhile, the share of nonsubject imports based on quantity, decreased by 0.5 percentage points from 2017 to 2019,

and was lower by 10.1 percentage points during interim 2020 than in interim 2019. The share of nonsubject imports based on value increased by 0.9 percentage points during 2017-19, but were lower by 11.6 percentage points during interim 2020 than in interim 2019.

Table IV-10
Silicon metal: Market shares, 2017-19, January-March 2019, and January-March 2020

Item	Calendar year			January to March	
	2017	2018	2019	2019	2020
	Quantity (short tons contained silicon)				
Apparent U.S. consumption	360,492	318,113	301,739	88,136	74,994
	Share of quantity (percent)				
U.S. producers' U.S. shipments	52.4	58.3	48.3	48.5	58.3
U.S. importers' U.S. imports from.--					
Bosnia-Herzegovina	2.0	2.9	3.5	3.7	3.8
Iceland	0.4	0.4	2.3	2.0	2.0
Kazakhstan	2.9	1.0	2.8	2.7	0.5
Malaysia	0.0	---	1.3	---	2.5
Subject sources	5.3	4.3	9.9	8.4	8.8
Nonsubject sources	42.3	37.4	41.8	43.0	32.9
All import sources	47.6	41.7	51.7	51.5	41.7
	Value (1,000 dollars)				
Apparent U.S. consumption	796,943	834,952	701,905	214,319	162,068
	Share of value (percent)				
U.S. producers' U.S. shipments	53.5	58.6	49.4	49.2	61.5
U.S. importers' U.S. imports from.--					
Bosnia-Herzegovina	1.9	2.6	2.9	3.1	2.7
Iceland	0.3	0.3	1.7	1.5	1.4
Kazakhstan	2.2	0.7	2.2	2.1	0.3
Malaysia	0.0	---	0.9	---	1.7
Subject sources	4.4	3.6	7.6	6.7	6.1
Nonsubject sources	42.1	37.8	43.0	44.0	32.4
All import sources	46.5	41.4	50.6	50.8	38.5

Note.--Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent.

Source: Compiled from data submitted in response to Commission questionnaires and official U.S. import statistics based on General Imports using HTS statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed July 21, 2020.

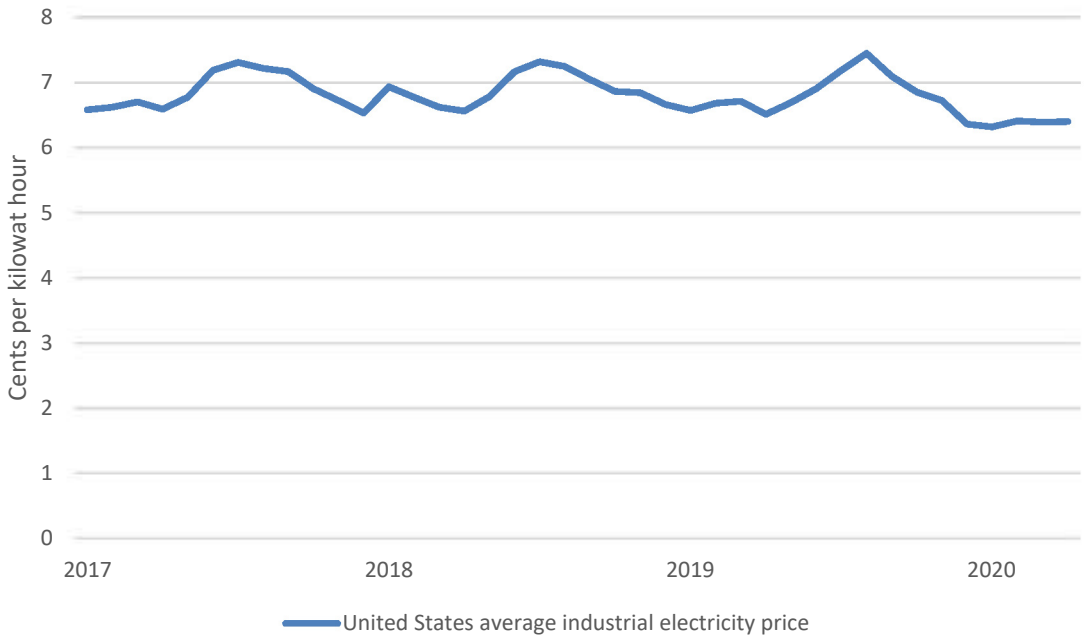
Part V: Pricing data

Factors affecting prices

Raw material costs

Silicon metal is produced from mined quartzite and consists almost entirely of elemental silicon with very small amounts of impurities (such as iron, calcium, and aluminum). U.S. producers reported that raw materials as a share of cost of goods sold decreased from *** percent in 2017 to *** percent in 2019. However, during January-March 2020, raw materials as a share of cost of goods sold accounted for *** percent of the cost of goods sold. Electricity prices typically fluctuate over the year, typically reaching their peak in July; however, the price in August 2019 was the highest for the whole period while the January 2020 price was the lowest reported for the period (figure V-1).

Figure V-1
U.S. average retail price of electricity, Industrial, monthly, January 2017-April 2020



Source: U.S. Energy Information Administration
https://www.eia.gov/electricity/data/browser/#/topic/7, retrieved June 29, 2020

Transportation costs to the U.S. market

Transportation costs for silicon metal shipped from subject countries to the United States averaged 1.0 percent for Bosnia and Herzegovina, 1.5 percent for Iceland, 4.2 percent for Kazakhstan, and 1.9 percent for Malaysia during 2019. These estimates were derived from official import data and represent the transportation and other charges on imports.[1]

U.S. inland transportation costs

Two of three responding U.S. producers and all nine responding importers reported that they typically arrange transportation to their customers. Most U.S. producers reported that their U.S. inland transportation costs ranged from 1 to 3 percent while most importers reported costs of 2 to 6 percent.

Pricing practices

Pricing methods

U.S. producers and importers reported setting prices mainly using transaction-by-transaction negotiations and contracts for determining their sales prices for silicon metal (table V-1). ***[2]

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

Method	U.S. producers	Importers
Transaction-by-transaction	3	10
Contract	2	11
Set price list	---	---
Other	1	2
Responding firms	3	12

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.

[1] The estimated transportation costs were obtained by subtracting the customs value from the c.i.f. value of the imports for 2019 and then dividing by the customs value based on the HTS subheading 2804.69.1000 and 2804.69.5000.

[2] One of the importers reported that it used the published price, "less an agreed discount."

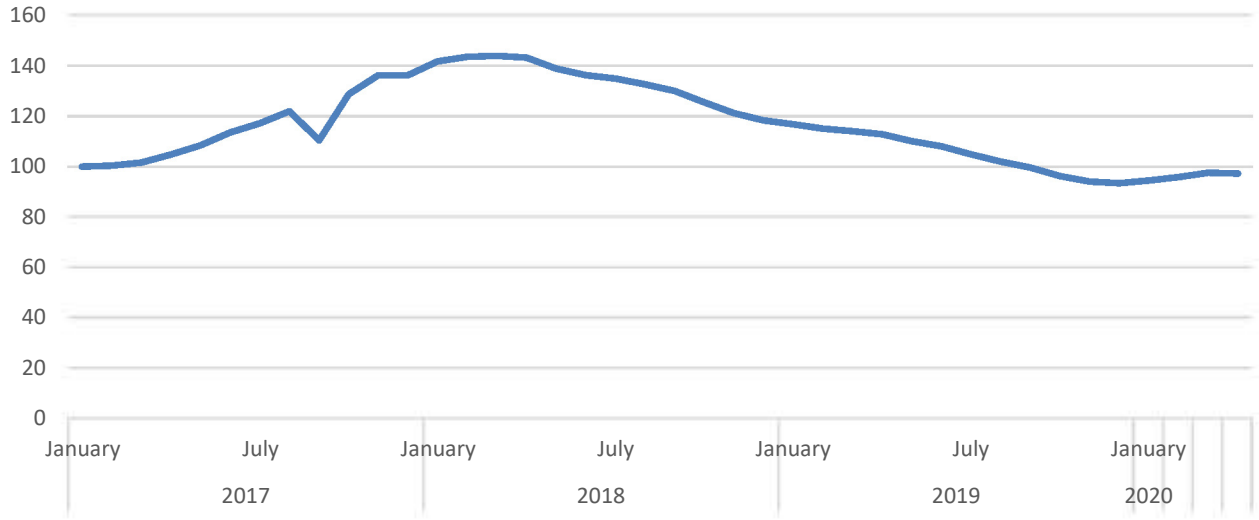
U.S. producers and importers reported selling most of their silicon metal under annual contracts (table V-2). Published price indices are readily available to purchasers, and form part of contract negotiations with suppliers (figure V-2). All producer and most importer contracts are reported to be indexed to the published price of silicon metal. There are no published price series data for chemical or polysilicon grade silicon metal, but purchasers in all sectors reference indices based on sales to the aluminum purchasers.[3] The reported average price of silicon metal increased irregularly from January 2017 to March 2018, fell until January 2020, and increased slightly through April 2020. The price in September 2019 to April 2020 was below the price in January 2017.

Table V-2
Silicon metal: U.S. producers' and importers' shares of U.S. commercial shipments by type of sale, 2019

Type of sale	U.S. producers	Importers
Long-term contracts	***	***
Annual contracts	***	***
Short-term contracts	***	***
Spot sales	***	***

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

Figure V-2
Silicon metal: Published price index of silicon metal, *, average price reported, cents per pound, for all transactions during the month, January 2017-April 2020**



Source: USGS Mineral Industry Surveys, *** and USGS. https://www.usgs.gov/centers/nmic/mineral-industry-surveys#S

[3] *Silicon Metal From Australia, Brazil, Kazakhstan, and Norway*, 83 FR 16382, April 16, 2018, p. V-1.

Sales terms and discounts

U.S. producers and importers typically quote prices on a delivered basis. All responding producers and 10 of 11 responding importers reported no discount policy.[4]

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 January 2017 to March 2020.

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 and/or polysilicon 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.

Three U.S. producers and five importers provided usable pricing data for sales of the requested products, although not all firms reported pricing for all products for all quarters.[5] Pricing data reported by these firms accounted for approximately 88 percent of U.S. producers' commercial U.S. shipments of silicon metal, *** percent of U.S. shipments of subject imports from Bosnia and Herzegovina, *** percent for Iceland, *** percent for Kazakhstan, and *** percent for Malaysia in 2019.

Price data for products 1-3 are presented in tables V-3 to V-5 and figures V-3 to V-5. Nearly all pricing data reported by importers was for product 2, product sold to secondary aluminum producers. Data for product 1 were only reported in two quarters for imports from one country, Kazakhstan.

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[4] One of the importers reported that it used the published price, "less an agreed discount." One importer reported quantity and volume discounts.

[5] 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 and margins of underselling/(overselling), by quarter, January 2017 to March 2020

Period	United States		Kazakhstan		
	Price (per short ton contained silicon)	Quantity (short tons contained silicon)	Price (per short ton contained silicon)	Quantity (short tons contained silicon)	Margin (percent)
2017: Jan.-Mar.	***	***	***	***	***
Apr.-June	***	***	***	***	***
July-Sept.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***
2018: Jan.-Mar.	***	***	***	***	***
Apr.-June	***	***	***	***	***
July-Sept.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***
2019: Jan.-Mar.	***	***	***	***	***
Apr.-June	***	***	***	***	***
July-Sept.	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***
2020: Jan.-Mar.	***	***	***	***	***

Note: 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.

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

Figure V-3
Silicon metal: Weighted-average prices and quantities of domestic and imported product 1, by quarter, January 2017 to March 2020

* * * * * * *

Table V-4
Silicon metal: Weighted-average f.o.b. prices and quantities of domestic and imported product 2 and margins of underselling/(overselling), by quarter, January 2017 to March 2020

Period	United States		Bosnia and Herzegovina			Iceland		
	Price (per short ton contained silicon)	Quantity (short tons contained silicon)	Price (per short ton contained silicon)	Quantity (short tons contained silicon)	Margin (percent)	Price (per short ton contained silicon)	Quantity (short tons contained silicon)	Margin (percent)
2017: Jan.-Mar.	***	***	***	***	***	***	***	***
Apr.-June	***	***	***	***	***	***	***	***
July-Sept.	***	***	***	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***	***	***	***
2018: Jan.-Mar.	***	***	***	***	***	***	***	***
Apr.-June	***	***	***	***	***	***	***	***
July-Sept.	***	***	***	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***	***	***	***
2019: Jan.-Mar.	***	***	***	***	***	***	***	***
Apr.-June	***	***	***	***	***	***	***	***
July-Sept.	***	***	***	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***	***	***	***
2020: Jan.-Mar.	***	***	***	***	***	***	***	***

Period	Kazakhstan			Malaysia		
	Price (per short ton contained silicon)	Quantity (short tons contained silicon)	Margin (percent)	Price (per short ton contained silicon)	Quantity (short tons contained silicon)	Margin (percent)
2017: Jan.-Mar.	***	***	***	***	***	***
Apr.-June	***	***	***	***	***	***
July-Sept.	***	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***	***
2018: Jan.-Mar.	***	***	***	***	***	***
Apr.-June	***	***	***	***	***	***
July-Sept.	***	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***	***
2019: Jan.-Mar.	***	***	***	***	***	***
Apr.-June	***	***	***	***	***	***
July-Sept.	***	***	***	***	***	***
Oct.-Dec.	***	***	***	***	***	***
2020: Jan.-Mar.	***	***	***	***	***	***

Note: 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.

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

Figure V-4
Silicon metal: Weighted-average prices and quantities of domestic and imported product 2, by quarter, January 2017 to March 2020

* * * * * * *

Table V-5
Silicon metal: Weighted-average f.o.b. prices and quantities of domestic product 3 and margins of underselling/(overselling), by quarter, January 2017 to March 2020

Period	United States	
	Price (per short ton contained silicon)	Quantity (short tons contained silicon)
2017: Jan.-Mar.	***	***
Apr.-June	***	***
July-Sept.	***	***
Oct.-Dec.	***	***
2018: Jan.-Mar.	***	***
Apr.-June	***	***
July-Sept.	***	***
Oct.-Dec.	***	***
2019: Jan.-Mar.	***	***
Apr.-June	***	***
July-Sept.	***	***
Oct.-Dec.	***	***
2020: Jan.-Mar.	***	***

Note: Product 3: Sold to chemical and/or polysilicon 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.

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

Figure V-5
Silicon metal: Weighted-average prices and quantities of domestic and imported product 3, by quarter, January 2017 to March 2020

* * * * * * *

Price trends

In general, prices increased during January 2017 to March 2020. Table V-6 summarizes the price trends, by country and by product. As shown in the table, domestic price increases were *** and *** percent for products 1 and 3, respectively, during January 2017 to March 2020 and decreased *** percent for product 2 during January 2017 to March 2020. Import prices increased *** percent for Kazakhstan during January 2017 to March 2020 and decreased *** percent for Bosnia and Herzegovina during April 2017 to March 2020. U.S. and import prices tended to follow similar patterns, with pricing reaching their highest levels in 2018 (figures V-6 and V-7).

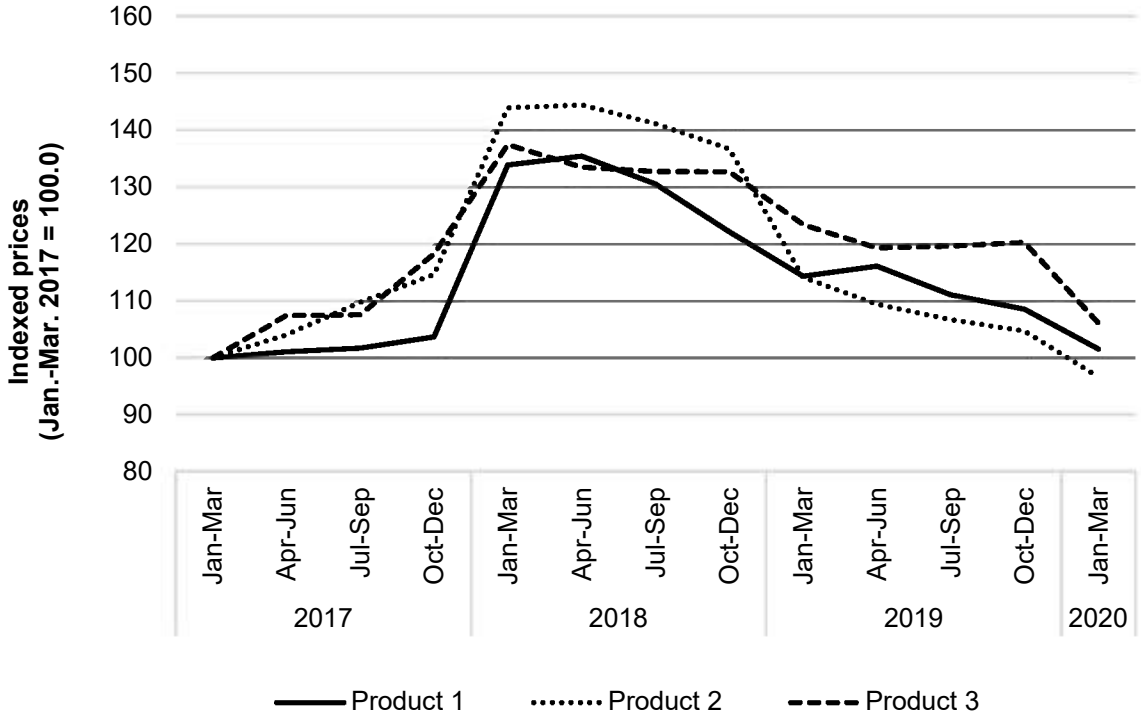
Table V-6
Silicon metal: Summary of weighted-average f.o.b. prices for products 1-3 from the United States and Bosnia and Herzegovina, Iceland, Kazakhstan, and Malaysia

Item	Number of quarters	Low price (per short ton contained silicon)	High price (per short ton contained silicon)	Change in price (percent)
Product 1				
United States	***	***	***	***
Kazakhstan	***	***	***	***
Product 2				
United States	***	***	***	***
Bosnia and Herzegovina	***	***	***	***
Iceland	***	***	***	***
Kazakhstan	***	***	***	***
Malaysia	***	***	***	***
Product 3				
United States	***	***	***	***

Note: Percentage change from the first or second quarter of 2017 in which data were available to the first quarter in 2020. Only countries for which prices were available are listed in this table.

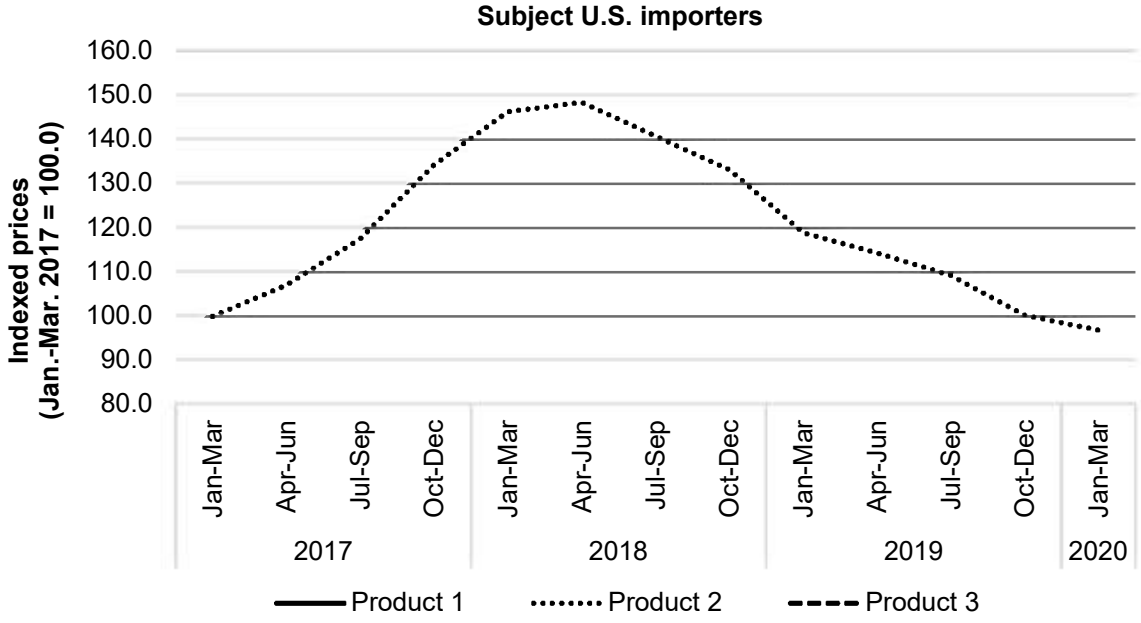
Source: Compiled from data submitted in response to Commission questionnaires.

Figure V-6
Silicon metal: Indexed U.S. producer prices, January 2017 to March 2020



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

Figure V-7
Silicon metal: Indexed subject U.S. importer prices, January 2017 to March 2020



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

Price comparisons

As shown in table V-7, imports undersold U.S. product in 21 of the 38 instances, (*** short tons of contained silicon) and oversold in the remaining 17 instances (*** short tons of contained silicon). Prices for product imported from Bosnia and Herzegovina were below those for U.S.-produced product in 7 of 12 instances (*** short tons contained silicon); margins of underselling ranged from 0.1 to 7.8 percent. In the remaining five instances (*** short tons contained silicon), prices for product from Bosnia and Herzegovina were between 0.1 and 14.4 percent above prices for the domestic product. Prices for product imported from Iceland were below those for U.S.-produced product in four of seven instances (*** short tons contained silicon); margins of underselling ranged from 3.1 to 9.9 percent. In the remaining three instances (*** short tons contained silicon), prices for product from Iceland were between 2.5 and 3.6 percent above prices for the domestic product. Prices for product imported from Kazakhstan were below those for U.S.-produced product in 8 of 13 instances (*** short tons contained silicon); margins of underselling ranged from 0.8 to 10.0 percent. In the remaining seven instances (*** short tons contained silicon), prices for product from Kazakhstan were between 0.1 and 4.4 percent above prices for the domestic product. Prices for product imported from Malaysia were below those for U.S.-produced product in two of four instances (*** short tons contained silicon); margins of underselling ranged from 1.3 to 11.3 percent. In the remaining two instances (*** short tons contained silicon), prices for product from Malaysia were between 1.2 and 1.4 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 2017 to December 2020

Source	Underselling				
	Number of quarters	Quantity (short tons contained silicon)	Average margin (percent)	Margin range (percent)	
				Min	Max
Product 1	2	***	***	***	***
Product 2	19	***	***	***	***
Total, underselling	21	***	***	***	***
Bosnia and Herzegovina	7	***	***	***	***
Iceland	4	***	***	***	***
Kazakhstan	8	***	***	***	***
Malaysia	2	***	***	***	***
Total, underselling	21	***	***	***	***
Source	**(Overselling)**				
	Number of quarters	**Quantity (short tons contained silicon)**	**Average margin (percent)**	**Margin range (percent)**	
				Min	**Max**
Product 2	17	***	***	***	***
Total, overselling	17	***	***	***	***
Bosnia and Herzegovina	5	***	***	***	***
Iceland	3	***	***	***	***
Kazakhstan	7	***	***	***	***
Malaysia	2	***	***	***	***
Total, overselling	17	***	***	***	***

Note: These data include only quarters in which there is a comparison between the U.S. and subject product. Only products for which prices were available are listed in this table.

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

Lost sales and lost revenue

Two of the three responding U.S. producers reported that they had to either reduce prices or roll back announced price increases, and two firms reported that they had lost sales. Two U.S. producers submitted lost sales and lost revenue allegations. The two responding U.S. producers identified 24 firms with which they lost sales or revenue (eight consisting lost sales allegations, 7 consisting of lost revenue allegations, and nine consisting of both types of allegations). The producers were unable to specify the countries in most allegations. "Malaysia and other suppliers" were reported in one allegation. Allegations were reported for all three full years and 2020.

Staff contacted 24 purchasers and received responses from 14 purchasers. Responding purchasers reported purchasing and importing 635,532 short tons of silicon metal during 2017-19 (table V-8). During 2019, responding purchasers purchased or imported 43.5 percent of their silicon metal from U.S. producers, 3.5 percent from Bosnia and Herzegovina, 0.7 percent from Iceland, 3.0 percent from Kazakhstan, and 0.2 percent from Malaysia, 48.0 percent from all other sources (table V-9).

Table V-8
Silicon metal: Purchasers' amount of purchases and changes in share of purchases by firm

Purchaser	Purchases in 2017 to 2019 (short tons contained silicon)			Change in domestic share (pp, 2017-19)	Change in subject country share (pp, 2017-19)
	Domestic	Subject	All other		
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
All purchasers	318,725	35,005	281,802	(5.0)	2.7

Note: All other includes all other sources and unknown sources.
Note: Percentage points (pp) change: Change in the share of the firm's total purchases of domestic and/or subject country imports between first and last years.

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

Table V-9
Silicon metal: Purchasers' amount of purchases and changes in share of purchases by country

	Quantity (short tons contained silicon)			Share of total		
Country	2017	2018	2019	2017	2018	2019
United States	110,870	124,735	83,120	48.5	57.8	43.5
Bosnia and Herzegovina	***	***	***	***	***	***
Iceland	***	***	***	***	***	***
Kazakhstan	***	***	***	***	***	***
Malaysia	***	***	***	***	***	***
Subject sources	10,834	9,897	14,274	4.7	4.6	7.5
All other sources	107,106	76,200	91,686	46.8	35.3	48.0
All sources	228,810	215,663	191,059	100.0	100.0	100.0

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

Purchasers were also asked about changes in their purchasing patterns from different sources since 2017 (table V-10). Of the responding purchasers, all purchasers reported that they purchased some domestic product: six reported decreasing purchases from domestic producers, two reported increasing purchases, two reported no change, and four reported fluctuating purchases. Seven of 14 purchasers reported purchasing or importing from Bosnia and Herzegovina, 5 from Iceland, 6 from Kazakhstan, 6 from Malaysia, and 12 from nonsubject sources.[6] Explanations for increasing purchases of domestic product included market turbulence and price, proximity, and delivery. Three of the five purchasers listed price as at least one of the reasons for reducing purchases from U.S. producers.[7] Other explanations for decreasing purchases of domestic product included: a shift in material supplied by Globe from its domestic production to material from its plant in Canada; reduced demand combined with limited credit from U.S. suppliers; and ***. Five purchasers reported increased purchases of silicon metal from nonsubject countries. Reasons included price, specifications, and terms; increased material from Brazil and Laos; and most of this increase was driven by Globe supplying from Canada rather than the United States.[8] Eight purchasers reported increased purchases from one or more subject

[6] Of the 14 responding purchasers, 6 purchasers indicated that they did not know the source of the silicon metal they purchased.

[7] One purchaser *** did not report its reason for reduced purchases of U.S. product in this question. Elsewhere in its survey response it reported that it reduced U.S. purchases because of price and because the shutting of domestic plants reduced supply security.

[8] Five purchasers reported reasons for reduced purchases for product from nonsubject sources including: increased domestic purchase for price and convenience; eliminated purchases for Brazil and Australia because of the 2017 trade case; eliminated purchases from Australia; market turbulence; and reduced demand.

country. Four of these purchasers reported they were testing material from a new source, approving a new supplier or just having a new supplier; three reported price/cost motivated purchases; one reported increased purchases were due to the sales terms that were offered; and one did not explain the increase in its response to this question but reported elsewhere that it increased imports mainly because of delivery and reduced purchases from the U.S. producers ***.

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

Source of purchases	Did not purchase	Decreased	Increased	Constant	Fluctuated
United States	---	6	2	2	4
Bosnia and Herzegovina	6	1	4	1	1
Iceland	6	1	4	---	---
Kazakhstan	6	2	1	---	3
Malaysia	6	---	5	---	2
All other sources	---	5	5	---	2
Sources unknown	5	1	---	1	3

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

Of the 13 responding purchasers, 11 reported that, since 2017, they had purchased imported silicon metal from Bosnia and Herzegovina, Iceland, Kazakhstan, or Malaysia instead of U.S.-produced product. Seven purchasers reported buying product from Bosnia and Herzegovina instead of U.S.-produced product, five purchasers reported buying product from Iceland instead of U.S.-produced product, seven purchasers reported buying product from Kazakhstan instead of U.S.-produced product, and seven purchasers reported buying product from Malaysia instead of U.S. produced product.

Eight of these 11 purchasers reported that subject import prices were lower than U.S.-produced product; all eight of these purchasers reported that price was a primary reason for the decision to purchase subject imports rather than U.S.-produced product. The number of purchasers reporting price was the primary reason to purchase imported product rather than U.S.-produced product was four for Bosnia and Herzegovina, four for Iceland, five for Kazakhstan, and three for Malaysia. Seven purchasers estimated the quantity of silicon metal purchased from subject countries instead of domestic product; quantities ranged from *** short tons contained silicon to *** short tons contained silicon (table V-11, summary of responses by country in table V-12). A number of these purchasers reported purchases of imported silicon metal because price but also reported other factors including the closing of domestic plants (reducing supply security), source used by primary supplier with good delivery, quality, and sizing.

Table V-11
Silicon metal: Purchasers' responses to purchasing subject imports instead of domestic product

Purchaser	Purchased imports instead of domestic	Import price was lower	If purchased imports instead of domestic, was price a primary reason		
			Yes no	If Yes, quantity purchased instead of domestic (short tons)	If No, non-price reason
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
***	***	***	***	***	***
All purchasers	Yes--11; No--2	Yes--8; No--3	Yes--8; No--1	14,170	

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

Table V-12
Silicon metal: Purchasers' responses to purchasing subject imports instead of domestic product by country

Source	Count of purchasers reporting subject instead of domestic	Count of purchasers reported that imports were priced lower	Count of purchasers reporting that price was a primary reason for shift	Quantity subject purchased (short tons contained silicon)
Bosnia and Herzegovina	7	5	4	***
Iceland	5	4	4	***
Kazakhstan	7	5	5	***
Malaysia	7	4	3	***
Any subject source	11	8	8	***

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

Of the 14 responding purchasers, three reported that U.S. producers had reduced prices in order to compete with lower-priced imports from Bosnia and Herzegovina, Iceland, Kazakhstan, and Malaysia; one reported U.S. producers had not reduced prices in order to compete with lower-priced imports from subject countries[9] (table V-13, summary of responses by country in table V-14). The reported estimated price reduction was 2 percent for each of the countries for which a price reduction was estimated including 2 percent for Iceland and Kazakhstan. For the other countries, one purchaser reported that price was reduced but it was not able to estimate the size of the reductions.

In responding to the lost sales lost revenue survey, some purchasers provided additional information on purchases and market dynamics. Purchasers reported that domestic producers use Platts 5-5-3 index and an added price floor and ceiling; domestic quotes are in line with other suppliers; and GSM typically sets initial RFQ pricing about 5 percent above published pricing and "MS Silicon does what GSM does."

[9] Ten reported that they did not know if U.S. producers reduced prices to compete with subject imports.

Table V-13
Silicon metal: Purchasers' responses to U.S. producer price reductions

Purchaser	U.S. producers reduced priced to compete with subject imports (Y/N)	If U.S. producers reduced prices	
		Estimated U.S. price reduction (percent)	Additional information, if available
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
***	***	***	***
Totals /average	Yes--3; No--1	***	

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

Table V-14
Silicon metal: Purchasers' responses to purchasing subject imports instead of domestic product by country

Source	Count of purchasers reporting U.S. producers reduced prices	Simple average of estimated U.S. price reduction (percent)	Range of estimated U.S. price reductions (percent)
Bosnia and Herzegovina	1	***	***
Iceland	2	***	***
Kazakhstan	3	***	***
Malaysia	1	***	***
All subject sources	3	***	***

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

PART VI: FINANCIAL EXPERIENCE OF U.S. PRODUCERS

Background

Three firms, DC Alabama, Globe, and Mississippi Silicon, reported financial results on their U.S. silicon metal operations.[1] [2] For the period as a whole and with regard to total operations reflecting both commercial sales and transfers of silicon metal, Globe accounted for *** percent of total silicon metal sales quantity, DC Alabama accounted for *** percent, and Mississippi Silicon accounted for *** percent in 2019.

Events or activities impacting the silicon metal operations of U.S. producers include ***.[3] The manner in which these events or activities impacted the financial results of the industry is described below. When considering open market silicon metal operations (i.e., operations reflecting only commercial sales), *** accounted for *** percent of commercial silicon metal sales quantity, *** accounted for *** percent, and *** accounted for *** percent from January 1, 2017 through March 31, 2020.[4]

Operations on Silicon Metal

Income-and-loss data for the U.S. producers' total operations on silicon metal are presented

[1] All 3 U.S. producers reported silicon metal financial results on a GAAP basis and for calendar-year periods.

[2] Globe's silicon metal operations are part of parent company Ferroglobe's Electrometallurgy—North America segment. Ferroglobe 2018 20-F, p. 70. Ferroglobe itself was created pursuant to the merger of Globe Specialty Metals and FerroAtlantica on December 23, 2015. Ferroglobe 2018 20-F, p. 36. Dow Silicones, which owns/operates DC Alabama, is the successor company to Dow Corning and is part of Dow's Performance Materials & Coatings segment. Dow 2019 10-Q, p. 64. Mississippi Silicon is a privately-held company, whose holding company *** is owned by ***. Submission from Petitioners' Counsel to USITC staff, July 31 and August 3, 2020.

[3] *** U.S. producer questionnaires, responses to II-2. *** U.S. producer questionnaire, response to III-10. ***.

[4] While the underlying production process is essentially the same, U.S. producers vary in terms of their focus on commercial sales versus transfers. ***. U.S. Producer questionnaire, response III-9a.

in table VI-1. Table VI-2 presents corresponding changes in average per short ton values. Table VI-3 presents company-specific financial information for total operations.

Table VI-1
Silicon metal: Results of overall operations of U.S. producers, 2017-19, January-March 2019, and January-March 2020

Item	Calendar year			January to March	
	2017	2018	2019	2019	2020
	Quantity (short tons contained silicon "SCTS")				
Commercial sales	***	***	***	***	***
Transfers to related firms	***	***	***	***	***
Total net sales	189,083	185,575	145,779	42,808	43,740
	Value (1,000 dollars)				
Commercial sales	***	***	***	***	***
Transfers to related firms	***	***	***	***	***
Total net sales	426,300	489,700	346,879	105,569	99,709
Cost of goods sold.-- Raw materials	194,829	202,755	153,429	42,946	47,797
Electricity	100,490	101,119	69,869	20,035	19,201
Direct labor	48,373	57,661	45,311	11,800	11,343
Other factory costs	99,550	108,661	154,567	32,743	24,592
Less: byproduct revenue	25,050	27,532	20,832	5,459	5,765
Total COGS	418,192	442,664	402,344	102,065	97,168
Gross profit or (loss)	8,108	47,036	(55,465)	3,504	2,541
SG&A expense	25,238	29,932	21,989	5,316	5,290
Operating income or (loss)	(17,130)	17,104	(77,454)	(1,812)	(2,749)
Interest expense	***	***	***	***	***
All other expenses	***	***	***	***	***
All other income	***	***	***	***	***
Net income or (loss)	(23,742)	10,172	(85,672)	(3,978)	(5,530)
Depreciation/amortization	41,709	42,803	42,339	11,075	10,956
Cash flow	17,967	52,975	(43,333)	7,097	5,426
	Ratio to net sales (percent)				
Cost of goods sold.-- Raw materials	45.7	41.4	44.2	40.7	47.9
Electricity	23.6	20.6	20.1	19.0	19.3
Direct labor	11.3	11.8	13.1	11.2	11.4
Other factory costs	23.4	22.2	44.6	31.0	24.7
Less: byproduct revenue	5.9	5.6	6.0	5.2	5.8
Average COGS	98.1	90.4	116.0	96.7	97.5
Gross profit or (loss)	1.9	9.6	(16.0)	3.3	2.5
SG&A expense	5.9	6.1	6.3	5.0	5.3
Operating income or (loss)	(4.0)	3.5	(22.3)	(1.7)	(2.8)
Net income or (loss)	(5.6)	2.1	(24.7)	(3.8)	(5.5)

Table continued on next page.

Table VI-1—Continued
Silicon metal: Results of overall operations of U.S. producers, 2017-19, January-March 2019, and January-March 2020

Item	Calendar year			January to March	
	2017	2018	2019	2019	2020
	Ratio to total COGS (percent)				
Cost of goods sold before offset.-- Raw materials	44.0	43.1	36.3	39.9	46.4
Electricity	22.7	21.5	16.5	18.6	18.7
Direct labor	10.9	12.3	10.7	11.0	11.0
Other factory costs	22.5	23.1	36.5	30.5	23.9
Average COGS	100.0	100.0	100.0	100.0	100.0
	Unit value (dollars per STCS)				
Commercial sales	***	***	***	***	***
Transfers to related firms	***	***	***	***	***
Total net sales	2,255	2,639	2,379	2,466	2,280
Cost of goods sold.-- Raw materials	1,030	1,093	1,052	1,003	1,093
Electricity	531	545	479	468	439
Direct labor	256	311	311	276	259
Other factory costs	526	586	1,060	765	562
Less: byproduct revenue	132	148	143	128	132
Average COGS	2,212	2,385	2,760	2,384	2,221
Gross profit or (loss)	43	253	(380)	82	58
SG&A expense	133	161	151	124	121
Operating income or (loss)	(91)	92	(531)	(42)	(63)
Net income or (loss)	(126)	55	(588)	(93)	(126)
	Number of firms reporting				
Operating losses	***	***	***	***	***
Net losses	***	***	***	***	***
Data	3	3	3	3	3

Note.—***.

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

Table VI-2
Silicon metal: Changes in the U.S. producers' average per short ton contained silicon values reported for overall operations 2017-19, January-March 2019, and January-March 2020

Item	Between calendar years			Between partial year period
	2017-19	2017-18	2018-19	2019-20
	Change in AUVs (percent)			
Commercial sales	▲***	▲***	▼***	▼***
Transfers to related firms	▲***	▲***	▼***	▼***
Total net sales	▲5.5	▲17.0	▼(9.8)	▼(7.6)
Cost of goods sold.-- Raw materials	▲2.1	▲6.0	▼(3.7)	▲8.9
Electricity	▼(9.8)	▲2.5	▼(12.0)	▼(6.2)
Direct labor	▲21.5	▲21.5	▲0.0	▼(5.9)
Other factory costs	▲101.4	▲11.2	▲81.1	▼(26.5)
Less: byproduct revenue	▲7.9	▲12.0	▼(3.7)	▲3.4
Average COGS	▲24.8	▲7.9	▲15.7	▼(6.8)
	Change in AUVs (dollars per STCS)			
Commercial sales	▲***	▲***	▼(***)	▼(***)
Transfers to related firms	▲***	▲***	▼(***)	▼(***)
Total net sales	▲125	▲384	▼(259)	▼(187)
Cost of goods sold.-- Raw materials	▲22	▲62	▼(40)	▲90
Electricity	▼(52)	▲13	▼(66)	▼(29)
Direct labor	▲55	▲55	▲0	▼(16)
Other factory costs	▲534	▲59	▲475	▼(203)
Less: byproduct revenue	▲10	▲16	▼(5)	▲4
Average COGS	▲548	▲174	▲375	▼(163)
Gross profit or (loss)	▼(423)	▲211	▼(634)	▼(24)
SG&A expense	▲17	▲28	▼(10)	▼(3)
Operating income or (loss)	▼(441)	▲183	▼(623)	▼(21)
Net income or (loss)	▼(462)	▲180	▼(642)	▼(34)

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

Table VI-3
Silicon metal: Results of operations of U.S. producers' overall operations, by firm, 2017-19, January-March 2019, and January-March 2020

Item	Calendar year			January to March	
	2017	2018	2019	2019	2020
	Total net sales (STCS)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	189,083	185,575	145,779	42,808	43,740
	Total net sales (1,000 dollars)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	426,300	489,700	346,879	105,569	99,709
	Cost of goods sold (1,000 dollars)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	418,192	442,664	402,344	102,065	97,168
	Gross profit or (loss) (1,000 dollars)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	8,108	47,036	(55,465)	3,504	2,541
	SG&A expenses (1,000 dollars)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	25,238	29,932	21,989	5,316	5,290
	Operating income or (loss) (1,000 dollars)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	(17,130)	17,104	(77,454)	(1,812)	(2,749)

Table continued on next page.

Table VI-3—Continued
Silicon metal: Results of operations of U.S. producers' overall operations, by firm, 2017-19, January-March 2019, and January-March 2020

Item	Calendar year			January to March	
	2017	2018	2019	2019	2020
	Net income or (loss) (1,000 dollars)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	(23,742)	10,172	(85,672)	(3,978)	(5,530)
	COGS to net sales ratio (percent)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	98.1	90.4	116.0	96.7	97.5
	Gross profit or (loss) to net sales ratio (percent)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	1.9	9.6	(16.0)	3.3	2.5
	SG&A expense to net sales ratio (percent)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	5.9	6.1	6.3	5.0	5.3
	Operating income or (loss) to net sales ratio (percent)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	(4.0)	3.5	(22.3)	(1.7)	(2.8)
	Net income or (loss) to net sales ratio (percent)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	(5.6)	2.1	(24.7)	(3.8)	(5.5)

Table continued on next page.

Table VI-3—Continued
Silicon metal: Results of operations of U.S. producers' overall operations, by firm, 2017-19, January-March 2019, and January-March 2020

Item	Calendar year			January to March	
	2017	2018	2019	2019	2020
	Unit net sales value (dollars per STCS)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	2,255	2,639	2,379	2,466	2,280
	Unit raw materials (dollars per STCS)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	1,030	1,093	1,052	1,003	1,093
	Unit electricity (dollars per STCS)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	531	545	479	468	439
	Unit direct labor (dollars per STCS)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	256	311	311	276	259
	Unit other factory costs (dollars per STCS)				
DC Alabama	***	***	***[1]	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	526	586	1,060	765	562
	Unit byproduct revenue (dollars per STCS)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	132	148	143	128	132

Table continued on next page.

Table VI-3—Continued
Silicon metal: Results of operations of U.S. producers' overall operations, by firm, 2017-19, January-March 2019, and January-March 2020

Item	Calendar year			January to March	
	2017	2018	2019	2019	2020
	Unit COGS (dollars per STCS)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	2,212	2,385	2,760	2,384	2,221
	Unit gross profit or (loss) (dollars per STCS)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	43	253	(380)	82	58
	Unit SG&A expenses (dollars per STCS)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	133	161	151	124	121
	Unit operating income or (loss) (dollars per STCS)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	(91)	92	(531)	(42)	(63)
	Unit net income or (loss) (dollars per STCS)				
DC Alabama	***	***	***	***	***
Globe	***	***	***	***	***
Mississippi Silicon	***	***	***	***	***
All firms	(126)	55	(588)	(93)	(126)

Note.—***.

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

Net sales

Commercial sales represent the majority of the U.S. industry's overall silicon metal revenue during 2017 through interim 2020 (*** percent of total sales value). Transfers, which were reported by *** and ***, accounted for *** percent total of sales value.

Quantity

Total silicon metal sales quantities for overall operations decreased in each full year from 2017 to 2019 and were slightly higher in interim 2020 compared to interim 2019 (see table VI-1). The decrease in the U.S. industry's total sales quantity primarily reflects the large decrease in commercial sales from 2018 to 2019.[5] *** had a decrease in net sales quantity from 2017 to 2018, then an increase from 2018 to 2019. *** had a slightly higher net sales quantity from interim 2020 than in interim 2019. *** total net sales quantity increased from full-year 2017 to 2018, but then drastically decreased from full-year 2018 to 2019. In the interim period, Globe's quantity was slightly higher in 2020 than in 2019 (see table VI-3).

Value

According to U.S. producers, silicon metal pricing/sales values are not directly tied to underlying material input or other manufacturing costs. ***, however, noted an indirect connection between silicon metal sales values and production costs inasmuch as the cost of material inputs can be influenced, to some extent, by demand for silicon metal.[6]

On an overall basis, average unit sales values (AUVs) (dollars per short ton of contained silicon) (see table VI-1) increased irregularly from 2017 to 2019.[7] The industry's average unit sales value was lower in interim 2020 than in interim 2019. To the extent that company-specific product

[5] *** accounted for the majority of the large decrease in net sales volume between 2018 and 2019.

[6] *** U.S. Producer questionnaire, response II-10.

[7] The average unit value of sales increased from 2017 to 2018 and then decreased in 2019. The petitioners give the explanation that from 2017 to 2018, the U.S. producers gained market share, in large part as a result of the Commission's investigation on silicon metal imports from Brazil, Canada, Kazakhstan, and Norway, and a consequent decline in silicon metal imports from those countries in 2018 during the pendency of those investigations and following the Commission's affirmative preliminary determination. From 2017 to 2018, U.S. producers also experienced increases in average prices for their U.S. shipments, and a return to positive gross and operating profits. Although the Commission issued its negative determinations on March 23, 2018, contracts to many customers for 2018 delivery would have been placed in late 2017. The pending investigations therefore would have affected total imports from those countries for full-year 2018. Petitioners' postconference brief, p. 14.

mix did not change substantially during the period, overall declines in average sales value were primarily a function of declines in silicon metal prices. Table VI-3 shows that U.S. producers differed in terms of the magnitude of changes in average sales value; however, the directional trends among the U.S. producers were ***, with *** of the producers reporting an increase in their net sales AUVs between 2017 and 2018, and *** U.S. producers reporting a decrease in their net sales AUVs in 2019. *** U.S. producers reported lower net sales AUVs in interim 2020 compared to interim 2019. *** reported the lowest company-specific average unit net sales value during the majority of the period. *** reported slightly higher AUVs in 2019 compared to 2017, with very similar AUVs in interim 2020 and interim 2019. For ***, the average unit value of sales increased from 2017 to 2018 and then decreased in 2019. The AUVs were lower in January to March 2020 than in January to March 2019.[8]

Transfer Valuation

Transfers reported by *** represent sales to related downstream affiliates, while the transfers reported by *** primarily represent *** sales to ***. Reflecting different reporting structures and operations, the underlying transfer valuations adopted by *** were based on somewhat different assumptions.[9]

Cost of goods sold and gross profit or loss

U.S producers vary in terms of the number and age of their facilities. Mississippi Silicon, whose facility began operations in 2015, has the newest silicon metal facility. In terms of vertical integration, *** U.S. producer that reported input purchases from related suppliers.[10]

[8] See the previous footnote for petitioners' explanation of trends.

[9] ***. U.S. producer questionnaires, response II-7. As described by Globe, ***. Submission with attachment from *** to USITC staff, August 3, 2020. ***. ***. U.S. producer questionnaires, response II-7.

[10] ***. *** U.S. producer questionnaire, response to III-7. *** and *** reported that neither purchased inputs from related suppliers. *** U.S. producer questionnaire, response to III-7. *** U.S. producer questionnaire, response to III-7.

In addition to facility restart and idling reported by ***, *** converted two furnaces to ferrosilicon production.[11] As described by ***, furnace conversion ***.[12]

The impact of idling on the financial results of *** is described further below. In 2019, *** recognized ***.[13]

Raw Materials

Raw material cost was the largest component of COGS during the majority of the period, ranging from 36.3 percent of COGS (prior to byproduct deduction) (2019) to 46.4 percent (January-March 2020) (see table Vl-1). In addition to other identified inputs (e.g., energy, labor, services), total raw material cost represents several primary items, which were common to all U.S. producers: quartz, carbonaceous reductants (e.g., coal, charcoal, petroleum coke, other), bulking agents (e.g., woodchips), and other materials (e.g., electrodes). For the U.S. industry as a whole, carbonaceous reductants (e.g., coal) accounts for the largest share of raw material costs, followed by electrodes (other materials), quartz, and bulking agents (e.g., woodchips), as shown in table VI-4.[14]

While reporting some variability, *** average per short ton raw material costs remained within relatively narrow ranges during the full-year periods and were higher

[11] *** U.S. producer questionnaire, response to II-2, II-10; *** U.S. producer questionnaire, response to II-2, ll-4b, ll-10.

[12] *** U.S. producer questionnaire, response to II-2, ll-4b, ll-10. ***. *** U.S. producer questionnaire, response to ll-4b.

[13] *** U.S. producer questionnaire, response to III-10. Notes to table VI-1 in this section of the report present calculated pro forma 2019 gross and operating results excluding ***.

[14] U.S. producers identified *** of the "other material" to be electrodes. *** U.S. producer questionnaire, response to III-9c

in January-March 2020 than in January-March 2019.[15] In contrast, *** average raw material cost, which was lowest on a company-specific basis throughout the period, increased *** in 2018 and was somewhat higher in January-March 2020 than in January-March 2019. *** noted that its raw material costs increased in the full years for 2017 and 2018, in particular ***. The cost of those materials ***.[16]

Table VI-4
Silicon metal: Raw material costs, calendar year 2019

Raw materials	Calendar year 2019		
	Value (1,000 dollars)	Unit value (dollars per STCS)	Share of value (percent)
Quartz	***	***	***
Carbonaceous reductants	***	***	***
Bulking agents	***	***	***
Other materials	***	***	***
Total, raw materials	153,857	1,055	100.0

Note.— The total raw material value for 2019 has a $428K difference from the total raw material value for 2019 shown in Table VI-1 due to rounding, ***.

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

Electricity

As a share of total COGS, electricity cost remained within a narrow range during the full-year period but declined somewhat at the end of the period. For the period as whole, electricity ranged from 16.5 percent of COGS (prior to byproduct deduction) (2019) to 22.7 percent (2017) (see table VI-1).

Direct labor and other factory costs

Direct labor as a share of COGS fluctuated somewhat but remained within a relatively narrow range throughout the period (10.7 percent of COGS (prior to byproduct deduction) (2019) and

[15] *** reports *** *** has *** U.S. producer questionnaire, response to IV-18. *** reports ***. *** U.S. producer questionnaire, response to IV-18.

[16] *** U.S. producer questionnaire, response to IV-18.

12.3 percent (2018)). The per-short ton cost of direct labor increased from $256 in 2017 to $311 in 2019 and was lower in interim 2020 than in interim 2019.[17]

The share of overall other factory costs (22.5 percent of COGS (prior to byproduct deduction) (2017) and 36.5 percent (2019)) varied more notably. In addition to the *** and included in other factory costs, the higher share of COGS accounted for by other factory costs in 2019 also reflects somewhat lower average raw material costs.

On a company-specific basis, ***, whose average per short ton other factory costs increased each year from 2017 through 2019, reported a large increase in other factory costs in 2019 compared to 2017 and 2018. Its other factory costs were *** lower in interim 2020 than in interim 2019. The majority of this 2019 increase was attributed to ***.[18]

*** average other factory costs per short ton were the lowest of the industry throughout the POI.[19] *** reported higher other factory costs in the full-year period for 2019 than in full-year 2017 and 2018, which reflects the net effect of the ***.[20] Its other factory

[17] *** had the largest company-specific impact on the industry's increase in the per-short ton cost of direct labor between 2017 and 2019. In actual dollars, *** and *** reported similar increases in their direct labor costs between 2017 and 2019. However, as seen in table VI-3, *** per-short ton cost of direct labor increased more than *** because of the decrease in *** sales volume.

[18] *** *** U.S. producer questionnaire, response III-10.

[19] ***. *** U.S. producer questionnaire, response to III-10.

[20] *** Petitioners' postconference brief, p. 9. According to Globe, ***. Submission with attachment from *** to USITC staff, August 3, 2020.

costs were lower in interim 2020 than in interim 2019, and the difference in those periods was that ***.[21]

In contrast, *** average other factory costs increased between 2017 and 2018, decreased from 2018 to 2019, and then were lower in January-March 2020 than in January-March 2019. Changes in *** other factory costs were attributed to increased ***, related to the company's *** as well as ***.[22]

Byproducts

Byproducts of the silicon metal process include silica fume, silicon dross/slag, silicon fines/silicon particles, crusher dust, and heavies.[23] [24] *** reported revenue for the byproducts of ***. *** reported revenue for the byproducts of ***, and *** reported revenue for the byproducts of ***.[25] As a ratio to net sales, the deduction for net

[21] *** *** U.S. producer questionnaire, response II-4b.

[22] According to Mississippi Silicon, the ***. Submission from *** to USITC staff, August 4, 2020.

[23] Petitioners' postconference brief, pp. 11-13.

[24] Wacker Polysilicon North America LLC (WPNA), Wacker Chemical Corporation, and Wacker Chemie AG state that the byproduct of the highest value and volume resulting from the production of silicon metal is Microsilica, also known as 'silica fume.' This product is used extensively in the construction industry to produce high performance concrete that is required for building bridges, bridge decks, and parking structures. Besides the already high demand for this material, the infrastructure funding initiatives currently in place and expected to be further increased as part of stimulus packages both in the U.S. as well as abroad will likely increase demand for this byproduct. Silicon dross, dust/particles, slag, and heavies are usually sold to the ferrosilicon industry where they are blended into additives that usually sell at prices comparable to ferrosilicon. Fines of silicon metal, generated during the crushing and handling of the finished product, if not contaminated, are often sold at higher prices than the byproducts but lower than the price of silicon metal as these can be used by consumers in their processes to the extent their processes permit the necessary adaptations. Respondent Wacker's postconference brief, p. 8.

[25] In general, the distinction between joint products, also called main products, and byproducts is largely dependent on the market value of the products in question and their contribution to overall revenue. As such, a product's designation as a byproduct or a main product can change over time given market conditions. For cost accounting purposes the market value of a byproduct is generally treated as a deduction to arrive at the cost of the main product. *Cost Accounting: Using a Cost Management Approach*, L. Gayle Rayburn, Irwin, 1993, pp. 258-259. Given differences in the way byproduct revenue can be recognized and in order to maintain consistency, the Commission's income statement format classified net byproduct revenue as a separate line item deduction to determine total COGS.

byproduct revenue did not change substantially during the period, fluctuating between 5.2 and 6 percent over the POI (see table VI-1).[26]

Cost of goods sold

Average unit COGS (dollars per short ton contained silicon) for the industry increased each year from 2017 to 2019, and then was lower in January-March 2020 than in January-March 2019. *** average unit COGS increased throughout the full-year periods and reached its highest level in 2019 in conjunction with ***. *** per-short ton COGS was lower in interim 2020 compared to interim 2019.

*** average unit COGS remained within a relatively narrow range throughout the period.[27] *** reported an increase in its average unit COGS in 2018, a decrease in 2019, and it was slightly lower in January-March 2020 than in January-March 2019.[28]

[26] *** U.S. Producer Questionnaire, response III-8a and III-8b. Byproduct revenue is being reported as an offset to COGS in the financial results presented in this section of the report.

[27] ***.

[28] Mississippi Silicon reported that raw material costs ***. *** U.S. Producer questionnaire, response IV-18.

Gross profit or loss

The U.S. industry's gross profit increased from 2017 to 2018, before worsening to a gross loss in 2019. There was a lower gross profit in interim 2020 than in interim 2019. The relatively large increase in gross profit in 2018 corresponded with a higher average per short ton sales value, which was partially offset by higher average COGS.

While *** reported gross losses in 2017, the gross loss reported by *** was higher than the gross loss reported by ***. In 2018, *** companies transitioned to a gross profit. In contrast, *** reported positive but declining gross profit during the full-year period from 2017 to 2018. Between 2018 and 2019, *** reported declines in their gross results, with ***.[29]

SG&A expenses and operating income or loss

On a company-specific basis, U.S. producers reported a range of SG&A expense ratios (total SG&A expenses divided by total revenue) with ***, which reported ***, reporting the lowest SG&A expense ratios throughout the period. ***, whose SG&A expense ratios were the highest throughout the period, reported its highest SG&A expense ratio in 2018. It had a higher SG&A expense ratio in January-March 2020 compared to January-March

[29] The level of gross loss by *** *** U.S. producer questionnaire, response III-10.

2019.[30] *** SG&A expense ratio increased irregularly between 2017 and 2019 and then was higher in in January-March 2020 than in January-March 2019.[31]

The U.S. industry as a whole had operating losses for all periods examined, except 2018.[32] Operating income improved from a loss of $17.1 million in 2017 to an income of $17.1 million in 2018, but worsened substantially to a loss of $77.5 million in 2019.[33] The industry's operating income was worse in interim 2020 (a loss of $2.7 million) than during interim 2019 (a loss of $1.8 million).

Interest expense, other expenses, and net income or loss

For the U.S. industry as a whole, interest expense did not vary greatly throughout the POI (see table VI-1). Other expenses were reported by *** throughout the period.

[30] According to Mississippi Silicon, ***. Submission from *** to USITC staff, August 4, 2020.

[31] According to Globe, ***. Submission with attachment from *** to USITC staff, August 3, 2020.

[32] The petitioners give the explanation that from 2017 to 2018, the U.S. producers gained market share, in large part the result of the Commission's investigation on silicon metal imports from Brazil, Canada, Kazakhstan, and Norway, and a consequent decline in silicon metal imports from those countries in 2018 during the pendency of those investigations and the Commission's affirmative preliminary determination. Petitioners' postconference brief, p. 14.

[33] ***. *** U.S. Producer Questionnaire, response III-10.

*** reported no other expenses.[34] While *** reported other income, the majority was reported by ***.[35]

While absolute amounts differed between operating income and net income due to the presence of interest expense and all other income and expenses, the overall and company-specific directional trends of net income were generally the same as operating income throughout the period.[36]

[34] *** U.S. producer questionnaire, response to III-9a.

[35] ***. *** U.S. producer questionnaire, response to III-10.

[36] The exception was that *** had an operating *** and net *** for interim 2019.

Variance analysis

A variance analysis is shown in table VI-5 and is based on the data in table VI-1.[37]

Table VI-5
Silicon metal: Variance analysis for U.S. producers, between calendar years and between partial year periods

Item	Between calendar years			Between partial year period
	2017-19	2017-18	2018-19	2019-20
	Value (1,000 dollars)			
Net sales:				
Price variance	18,211	71,309	(37,806)	(8,158)
Volume variance	(97,632)	(7,909)	(105,015)	2,298
Net sales variance	(79,421)	63,400	(142,821)	(5,860)
COGS:				
Cost variance	(79,927)	(32,231)	(54,608)	7,119
Volume variance	95,775	7,759	94,928	(2,222)
COGS variance	15,848	(24,472)	40,320	4,897
Gross profit or (loss) variance	(63,573)	38,928	(102,501)	(963)
SG&A expenses:				
Cost/expense variance	(2,531)	(5,162)	1,524	142
Volume variance	5,780	468	6,419	(116)
Total SG&A expense variance	3,249	(4,694)	7,943	26
Operating income variance	(60,324)	34,234	(94,558)	(937)
Summarized (at the operating income level) as:				
Price variance	18,211	71,309	(37,806)	(8,158)
Net cost/expense variance	(82,458)	(37,393)	(53,084)	7,261
Net volume variance	3,923	318	(3,668)	(39)

Note.—Unfavorable variances are shown in parentheses; all others are favorable

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

[37] 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 variance (in the case of the COGS and SG&A expense variance), and a volume variance. The sales or cost variance is calculated as the change in unit price or unit cost/expense times the new volume, while the volume variance is calculated as the change in volume times the old unit price or unit cost. 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 expense variances, respectively, and the volume variance is the sum of the volume components of the net sales, COGS, and SG&A expense variances.

Capital expenditures and research and development expenses

Table VI-6 presents U.S. producers' capital expenditures and research and development (R&D) expenses related to their silicon metal operations and table VI-7 presents corresponding narrative descriptions. There was an increase in capital expenditures from 2017 to 2018, then a decrease from 2018 to 2019. Capital expenditures were higher in interim 2020 compared to interim 2019. R&D expenses were stable throughout the POI ***.

Table VI-6
Silicon metal: Capital expenditures and research and development (R&D) expenses for U.S. producers, by firm, 2017-19, January-March 2019, and January-March 2020

Item	Calendar year			January to March	
	2017	2018	2019	2019	2020
	Capital expenditures (1,000 dollars)				
All firms	***	***	***	***	***
	Research and development expenses (1,000 dollars)				
All firms	***	***	***	***	***

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

Table VI-7
Silicon metal: Narrative descriptions of U.S. producers' capital expenditures and R&D expenses, by firm, 2017-19, January-March 2019, and January-March 2020

* * * * * * *

Assets and return on assets

Table VI-8 presents data on the U.S. producers' total assets and their operating return on assets.[38] The U.S. industry's total assets remained relatively stable throughout the POI, while the operating return on assets was positive in 2018 but negative in 2017 and 2019.

Table VI-8
Silicon metal: Value of assets used in production, warehousing, and sales, and return on investment for U.S. producers, by firm, 2017-19

Firm	Calendar years		
	2017	2018	2019
	Total net assets (1,000 dollars)		
All firms	573,625	583,498	532,168
	Operating return on assets (percent)		
All firms	(3.0)	2.9	(14.6)

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

Capital and investment

The Commission requested the U.S. producers of silicon metal describe any actual or potential negative effects on their return on investment or their growth, investment, ability to raise capital, existing development and production efforts (including efforts to develop a derivative or more advanced version of the product), or the scale of capital investments as a result of silicon metal imports from Bosnia-Herzegovina, Iceland, Kazakhstan, and Malaysia. Table VI-9 tabulates the U.S. producers' responses regarding actual negative effects on investment, growth and development, as well as anticipated negative effects. Table VI-10 presents U.S. producers' narrative responses regarding actual and anticipated negative effects on investment, growth and development.

[38] With respect to a company's overall operations, staff notes that a total asset value (i.e., the bottom line value on the asset side of a company's balance sheet) reflects an aggregation of a number of current and non-current assets, which, in many instances, are not product specific. Allocation factors were presumably necessary to report total asset values specific to U.S. producers' silicon metal operations. The ability of U.S. producers to assign total asset values to discrete product lines affects the meaningfulness of operating return on net assets.

Table VI-9
Silicon metal: Actual and anticipated negative effects of imports on investment and growth and development

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

Note.—***.

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

Table VI-10
Silicon metal: Narratives relating to actual and anticipated negative effects of imports on investment and growth and development since January 1, 2017

*	*	*	*	*	*	*

Table VI-10—Continued
Silicon metal: Narratives relating to actual and anticipated negative effects of imports on investment and growth and development since January 1, 2017

*	*	*	*	*	*	*

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 Bosnia and Herzegovina

The Commission issued foreign producers' or exporters' questionnaires to one firm believed to produce and/or export silicon metal from Bosnia and Herzegovina.[3] The Commission received a usable questionnaire response from one firm: R-S Silicon D.O.O. Mrkonjic Grad/B.S.I. D.O.O. Jajce ("RS Silicon").[4] This firm's exports to the United States accounted for approximately *** percent of U.S. imports of silicon metal from Bosnia and Herzegovina in 2019. According to estimates requested of the responding producer (RS Silicon), its production of silicon metal in Bosnia and Herzegovina reported in its questionnaire response accounts for *** production of silicon metal in Bosnia and Herzegovina in 2019.[5] Table VII- 1 presents information on the silicon metal operations of RS Silicon.

Table VII-1
Silicon metal: Summary data for RS Silicon, 2019

Firm	Production (short tons contained silicon)	Share of reported production (percent)	Exports to the United States (short tons contained silicon)	Share of reported exports to the United States (percent)	Total shipments (short tons contained silicon)	Share of firm's total shipments exported to the United States (percent)
RS Silicon	***	***	***	***	***	***
Total	***	***	***	***	***	***

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

Changes in operations

RS Silicon reported *** since January 1, 2017.

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

[4] According to its website, RS Silicon has the capacity to produce 16,000 tons of silicon metal per year. https://rssilicon.com/about-us/.

[5] According to RS Silicon, ***. Email correspondence with ***, July 28, 2020.

Operations on silicon metal

Table VII-2 presents information on the silicon metal operations of RS Silicon for 2017-19, January-March 2019, January-March 2020, and projections for 2020 and 2021.[6]

RS Silicon's capacity *** from 2017 to 2019, but it was lower in interim 2020 than in interim 2019. The overall production increased by *** percent from 2017 to 2019 while capacity utilization also increased by *** percentage points from 2017 to 2019 and was higher in interim 2020 than during interim 2019. In addition, end-of-period inventories increased by *** percent during 2017-19, while end-of-period inventories were higher during interim 2020 than in interim 2019. Total home market shipments were less than *** during 2017-19.[7]

Total shipments of silicon metal, based on quantity, for RS Silicon decreased by *** percent from 2017 to 2019. Exports of silicon metal to the United States increased from *** percent and were lower by *** percent during interim 2020 than in interim 2019. Exports of silicon metal to all other markets decreased by *** percent during 2017-19, but were higher by *** percent during interim 2020 than in interim 2019. As a share of total shipments, exports to the United States increase by *** percentage points from 2017 to 2019, but were lower by *** percentage points during interim 2020 than during interim 2019. Exports to all other markets as a share of total shipments decreased by *** percentage points from 2017 to 2019, but were *** percentage points higher during interim 2020 than in interim 2019. Other export markets during 2019 identified by RS Silicon included ***.[8] [9]

---

[6] RS Silicon ***.

[7] Projections indicate that capacity, production, total shipments, export shipments, and most other indicators ***.

[8] RS Silicon foreign producer questionnaire response, section II-8.

[9] The primary export markets outside the United States during 2019 for RS Silicon, which include percentages of exports to each country, are ***. Email Message from *** July 28, 2020.

Table VII-2
Silicon metal: Data for RS Silicon, 2017-19, January-March 2019, January-March 2020, and projections for 2020 and 2021

Item	Actual experience					Projections	
	Calendar year			January to March		Calendar year	
	2017	2018	2019	2019	2020	2020	2021
	Quantity (short tons contained silicon)						
Capacity	***	***	***	***	***	***	***
Production	***	***	***	***	***	***	***
End-of-period inventories	***	***	***	***	***	***	***
Shipments:							
Home market shipments:							
Internal consumption/ transfers	***	***	***	***	***	***	***
Commercial home market shipments	***	***	***	***	***	***	***
Total home market shipments	***	***	***	***	***	***	***
Export shipments to:							
United States	***	***	***	***	***	***	***
All other markets	***	***	***	***	***	***	***
Total exports	***	***	***	***	***	***	***
Total shipments	***	***	***	***	***	***	***
	Ratios and shares (percent)						
Capacity utilization	***	***	***	***	***	***	***
Inventories/production	***	***	***	***	***	***	***
Inventories/total shipments	***	***	***	***	***	***	***
Share of shipments:							
Home market shipments:							
Internal consumption/ transfers	***	***	***	***	***	***	***
Commercial home market shipments	***	***	***	***	***	***	***
Total home market shipments	***	***	***	***	***	***	***
Export shipments to:							
United States	***	***	***	***	***	***	***
All other markets	***	***	***	***	***	***	***
Total exports	***	***	***	***	***	***	***
Total shipments	***	***	***	***	***	***	***
	Quantity (short tons contained silicon)						
Resales exported to the United States	***	***	***	***	***	***	***
Total export to the United States	***	***	***	***	***	***	***
	Ratios and shares (percent)						
Share of total exports to the United States:							
Exported by producers	***	***	***	***	***	***	***
Exported by resellers	***	***	***	***	***	***	***
Adjusted share of total shipments to the							
United States	***	***	***	***	***	***	***

Note.--Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent.

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

Alternative products

RS Silicon reported ***.

Exports

According to GTA, the leading export markets for silicon metal from Bosnia and Herzegovina are the United Kingdom, Italy, and Germany (table VII-3). Table VII-3 indicates no available data for exports of silicon metal to the United States during 2017-19. During 2019, the United Kingdom was the top export market for silicon metal, based on quantity, from Bosnia and Herzegovina, accounting for 34.7 percent, followed by Italy, accounting for 29.4 percent.

Table VII-3
Silicon metal: Bosnia and Herzegovina exports by destination market, 2017-19

Destination market	Calendar year		
	2017	2018	2019
	Quantity (short tons contained silicon)		
United States	---	---	---
United Kingdom	7,136	9,733	10,342
Italy	17,862	11,633	8,757
Germany	4,959	4,236	5,088
Slovakia	3,860	2,589	2,463
Slovenia	1,755	1,358	1,166
Czech Republic	240	506	877
Romania	965	480	397
France	212	---	318
All other destination markets	899	1,508	423
Total exports	37,888	32,044	29,831
	Value (1,000 dollars)		
United States	---	---	---
United Kingdom	14,528	21,690	17,959
Italy	31,212	25,854	15,793
Germany	8,595	9,347	9,005
Slovakia	6,984	5,656	4,310
Slovenia	3,316	2,874	2,211
Czech Republic	439	1,008	1,389
Romania	1,739	1,054	713
France	407	---	663
All other destination markets	1,542	3,342	723
Total exports	68,762	70,825	52,766

Table continued on next page.

Table VII-3--Continued
Silicon metal: Bosnia and Herzegovina exports by destination market, 2017-19

Destination market	Calendar year		
	2017	2018	2019
	Unit value (dollars per STCS)		
United States	---	---	---
United Kingdom	2,036	2,228	1,737
Italy	1,747	2,222	1,803
Germany	1,733	2,206	1,770
Slovakia	1,810	2,185	1,750
Slovenia	1,890	2,115	1,896
Czech Republic	1,827	1,995	1,583
Romania	1,802	2,194	1,795
France	1,922	---	2,086
All other destination markets	1,714	2,217	1,707
Total exports	1,815	2,210	1,769
	Share of quantity (percent)		
United States	---	---	---
United Kingdom	18.8	30.4	34.7
Italy	47.1	36.3	29.4
Germany	13.1	13.2	17.1
Slovakia	10.2	8.1	8.3
Slovenia	4.6	4.2	3.9
Czech Republic	0.6	1.6	2.9
Romania	2.5	1.5	1.3
France	0.6	---	1.1
All other destination markets	2.4	4.7	1.4
Total exports	100.0	100.0	100.0

Note.--Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. United States is shown at the top, all remaining top export destinations shown in descending order of 2019 data.

Source: Official exports statistics under HS subheading 2804.69 reported by UN comtrade in the Global Trade Atlas database, accessed July 16, 2020.

The industry in Iceland

The Commission issued foreign producers' or exporters' questionnaires to one firm believed to produce and/or export silicon metal from Iceland.[10] The Commission received a usable questionnaire response from one firm: PCC BakkiSilicon hf ("PCC").[11] This firm's exports to the United States accounted for approximately *** percent of U.S. imports of silicon metal

[10] This firm was identified through a review of information submitted in the petition and contained in *** records.

[11] According to its website, PCC has the capacity to produce 32,000 metric tons (35,274 short tons) annually at its Husavik (island) state-of-the-art facility. http://www.pcc.is/.

from Iceland in 2019. According to estimates requested of the responding producer (PCC), its production of silicon metal in Iceland reported in its questionnaire response accounts for *** production of silicon metal in Iceland in 2019.[12] Table VII-4 presents information on the silicon metal operations of PCC.

Table VII-4
Silicon metal: Summary data for PCC, 2019

Firm	Production (short tons contained silicon)	Share of reported production (percent)	Exports to the United States (short tons contained silicon)	Share of reported exports to the United States (percent)	Total shipments (short tons contained silicon)	Share of firm's total shipments exported to the United States (percent)
PCC BakkiSilicon	***	***	***	***	***	***
Total	***	***	***	***	***	***

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

Changes in operations

As presented in table VII-5 PCC reported *** operational and organizational changes since January 1, 2017.

[12] According to PCC's website, silicon metal production started in April 2018 at its Husavik (island) facility. http://www.pcc.is/.

Table VII-5
Silicon metal: PCCs' reported changes in operations, since January 1, 2017

Item / Firm	Reported changed in operations
Plant openings:	
***	***
Prolonged shutdowns or curtailments:	
***	***
Revised labor agreements:	
***	***

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

Operations on silicon metal

Table VII-6 presents information on the silicon metal operations for PCC in Iceland during 2017-19, January-March 2019, January-March 2020, and projections for 2020 and 2021.

PCC's capacity increased from *** in 2017 to *** short tons in 2018, and was *** percent higher in 2019 than 2018, while it *** in interim 2020 and interim 2019. The overall production increased from *** during 2017 to *** short tons of silicon metal during 2018 and increased to *** short tons in 2019. Capacity utilization increased from *** percent in 2018 to *** percent in 2019 and was *** percentage points higher in interim 2020 than during interim 2019. During 2017-19, end-of-period inventories increased from *** during 2017 to *** short tons during 2018 and increased by *** percent from 2018 to 2019, while end-of-period inventories were lower by *** percent during interim 2020 compared to interim 2019. Internal consumption/transfers increased by *** percent from 2018 to 2019, and were lower by *** during interim 2020 than in interim 2019.[13]

Total shipments of silicon metal, based on quantity, for PCC increased from *** during 2017 to *** short tons in 2018 to *** short tons during 2019, and total shipments were higher by *** percent during interim 2020 than in interim 2019. Exports of silicon metal to the United States increased from *** during 2017 to *** short tons during 2018 and increased to *** short tons during 2019, but were lower by *** percent during interim 2020 than in interim 2019. Exports of silicon metal to all other markets increased from *** during 2017 to *** short tons during 2018 to *** short tons during 2019. Export shipments to all other markets were higher by *** percent during interim 2020 than in interim 2019. As a share of total shipments, exports to the United States accounted for *** percent during 2018 and *** percent during 2019, but were lower by *** percentage points during interim 2020 than in interim 2019.

[13] Projections indicate that capacity ***, production is projected to ***, total shipments and export shipments are both projected to ***, and most other indicators ***.

Exports to all other markets as a share of total shipments accounted for *** percent during 2018 and decreased by *** percentage points during 2019, but were *** percentage points higher during interim 2020 than in interim 2019. Other export markets during 2019 identified by PCC included ***.[14]

[14] PCC foreign producer questionnaire response, section II-8.

Table VII-6
Silicon metal: Data for PCC, 2017-19, January-March 2019, January-March 2020, and projections for 2020 and 2021

Item	Actual experience					Projections	
	Calendar year			January to March		Calendar year	
	2017	2018	2019	2019	2020	2020	2021
	Quantity (short tons contained silicon)						
Capacity	***	***	***	***	***	***	***
Production	***	***	***	***	***	***	***
End-of-period inventories	***	***	***	***	***	***	***
Shipments:							
Home market shipments:							
Internal consumption/ transfers	***	***	***	***	***	***	***
Commercial home market shipments	***	***	***	***	***	***	***
Total home market shipments	***	***	***	***	***	***	***
Export shipments to:							
United States	***	***	***	***	***	***	***
All other markets	***	***	***	***	***	***	***
Total exports	***	***	***	***	***	***	***
Total shipments	***	***	***	***	***	***	***
	Ratios and shares (percent)						
Capacity utilization	***	***	***	***	***	***	***
Inventories/production	***	***	***	***	***	***	***
Inventories/total shipments	***	***	***	***	***	***	***
Share of shipments:							
Home market shipments:							
Internal consumption/ transfers	***	***	***	***	***	***	***
Commercial home market shipments	***	***	***	***	***	***	***
Total home market shipments	***	***	***	***	***	***	***
Export shipments to:							
United States	***	***	***	***	***	***	***
All other markets	***	***	***	***	***	***	***
Total exports	***	***	***	***	***	***	***
Total shipments	***	***	***	***	***	***	***
	Quantity (short tons contained silicon)						
Resales exported to the United States	***	***	***	***	***	***	***
Total export to the United States	***	***	***	***	***	***	***
	Ratios and shares (percent)						
Share of total exports to the United States:							
Exported by producers	***	***	***	***	***	***	***
Exported by resellers	***	***	***	***	***	***	***
Adjusted share of total shipments to the United States	***	***	***	***	***	***	***

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

Alternative products

As shown in table VII-7, PCC ***.[15]

Exports

According to GTA, the leading export markets for silicon metal from Iceland are the Netherlands, United States, and Germany (table VII-8). During 2019, the United States was the second largest export market for silicon metal from Iceland, accounting for 18.9 percent, preceded by the Netherlands, accounting for 35.4 percent, and followed by Germany, accounting for 16.1 percent.

[15] PCC indicated ***." PCC foreign producer questionnaire response, II-10.

Table VII-8
Silicon metal: Iceland's exports by destination market, 2017-19

Destination market	Calendar year		
	2017	2018	2019
	Quantity (short tons contained silicon)		
United States	---	816	5,931
Netherlands	6,799	5,115	11,068
Germany	572	332	5,027
Norway	---	1,119	2,313
Poland	---	---	1,753
Switzerland	---	308	1,722
United Kingdom	---	---	1,406
Egypt	---	---	1,177
United Arab Emirates	---	---	523
All other destination markets	522	66	381
Total exports	7,893	7,756	31,302
	Value (1,000 dollars)		
United States	---	1,749	12,188
Netherlands	12,930	2,657	4,193
Germany	64	757	6,354
Norway	---	29	1,291
Poland	---	---	2,419
Switzerland	---	555	2,380
United Kingdom	---	---	1,712
Egypt	---	---	25
United Arab Emirates	---	---	11
All other destination markets	983	128	600
Total exports	13,977	5,875	31,174

Table continued on next page.

Table VII-8--Continued
Silicon metal: Iceland's exports by destination market, 2017-19

Destination market	Calendar year		
	2017	2018	2019
	Unit value (dollars per STCS)		
United States	---	2,143	2,055
Netherlands	1,902	519	379
Germany	111	2,281	1,264
Norway	---	26	558
Poland	---	---	1,380
Switzerland	---	1,803	1,382
United Kingdom	---	---	1,217
Egypt	---	---	22
United Arab Emirates	---	---	22
All other destination markets	1,884	1,934	1,575
Total exports	1,771	757	996
	Share of quantity (percent)		
United States	---	10.5	18.9
Netherlands	86.1	65.9	35.4
Germany	7.2	4.3	16.1
Norway	---	14.4	7.4
Poland	---	---	5.6
Switzerland	---	4.0	5.5
United Kingdom	---	---	4.5
Egypt	---	---	3.8
United Arab Emirates	---	---	1.7
All other destination markets	6.6	0.9	1.2
Total exports	100.0	100.0	100.0

Note.--Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. United States is shown at the top, all remaining top export destinations shown in descending order of 2019 data.

Source: Official exports statistics under HS subheading 2804.69 as reported by Statistics Iceland in the Global Trade Atlas database, accessed July 16, 2020.

The industry in Kazakhstan

The Commission issued foreign producers' or exporters' questionnaires to one firm believed to produce and/or export silicon metal from Kazakhstan.[16] [17]The Commission received

[16] This firm was identified through a review of information submitted in the petition and contained in *** records.

[17] In its written submission to the Commission, the Ministry of Trade and Integration of the Republic of Kazakhstan indicated that MK KazSilicon stopped silicon metal production on October 20, 2015, and that its final sales were sold domestically on July 19, 2016. *Conference opening statement, Ministry of Trade and Integration of the Republic of Kazakhstan*, p. 1.

a usable questionnaire response from one firm: Tau-Ken Temir LLP ("Tau-Ken").[18] This firm's exports to the United States accounted for approximately *** percent of U.S. imports of silicon metal from Kazakhstan in 2019. According to estimates requested of the responding producer (Tau-Ken), its production of silicon metal in Kazakhstan reported in its questionnaire response accounts for *** production of silicon metal in Kazakhstan in 2019. Table VII-9 presents information on the silicon metal operations of Tau-Ken.

Table VII-9
Silicon metal: Summary data for Tau-Ken, 2019

Firm	Production (short tons contained silicon)	Share of reported production (percent)	Exports to the United States (short tons contained silicon)	Share of reported exports to the United States (percent)	Total shipments (short tons contained silicon)	Share of firm's total shipments exported to the United States (percent)
Tau-Ken Temir	***	***	***	***	***	***
Total	***	***	***	***	***	***

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

Changes in operations

As presented in table VII-10 Tau-Ken reported *** operational and organizational changes since January 1, 2017.

Table VII-10
Silicon metal: Tau-Ken's reported changes in operations, since January 1, 2017

Item / Firm	Reported changed in operations
Prolonged shutdowns or curtailments:	
***	***
Revised labor agreements:	
***	***

Note.—Tau-Ken indicated that its silicon metal production ***. Email message from *** July 21, 2020.

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

Operations on silicon metal

Table VII-11 presents information on the silicon metal operations of Tau-Ken in Kazakhstan during 2017-19, January-March 2019, January-March 2020, and projections for

[18] According to its website, Tau-Ken has the capacity to produce 25,000 tons of metallurgical grade silicon metal annually and it has reached total production capacity. http://tks.kz/en/tau-ken-temir-silicon-plant-started-full-capacity-operation/.

2020 and 2021. Tau-Ken's capacity *** during 2017-19, and *** in interim 2020. The overall production decreased by *** percent from 2017 to 2019, and *** in interim 2020. Capacity utilization decreased by *** percentage points but was *** in interim 2020. During 2017-19, end-of-period inventories increased by *** percent from 2017 to 2019, while end-of-period inventories were lower *** during interim 2020 than in interim 2019. Internal consumption/transfers and commercial home market shipments accounted for *** percent of all shipments during 2017-19, and *** in interim 2020 and interim 2019.[19]

Total shipments of silicon metal, based on quantity, for Tau-Ken decreased by *** percent during 2017-19, and total shipments were lower by *** percent during interim 2020 than in interim 2019. Exports of silicon metal to the United States decreased by *** percent during 2017-19, and were lower by *** percent during interim 2020 than in interim 2019. Exports of silicon metal to all other markets decreased by *** percent during 2017-19. Export shipments to all other markets were higher by *** percent during interim 2020 than in interim 2019. As a share of total shipments, exports to the United States fluctuated but increased by *** percentage points during 2017-19, but were lower by *** percentage points during interim 2020 than in interim 2019. Exports to all other markets as a share of total shipments decreased by *** percentage points during 2017-19, but were *** percentage points higher during interim 2020 than in interim 2019. Other export markets during 2019 identified by Tau-Ken included ***.[20] [21] According to its website, Tau-Ken exports silicon metal to the United States, Russia, Germany, Denmark, Netherlands, Norway, and other countries.[22]

[19] Projections indicate that ***.

[20] Tau-Ken foreign producer questionnaire response, section II-8.

[21] The primary export markets outside the United States during 2019 for Tau-Ken, which include percentages of exports to each country, are ***. Email Message from *** July 21, 2020.

[22] http://tks.kz/en/tau-ken-temir-silicon-plant-started-full-capacity-operation/.

Table VII-11
Silicon metal: Data for Tau-Ken in Kazakhstan, 2017-19, January-March 2019, January-March 2020, and projections for 2020 and 2021

Item	Actual experience					Projections	
	Calendar year			January to March		Calendar year	
	2017	2018	2019	2019	2020	2020	2021
	Quantity (short tons contained silicon)						
Capacity	***	***	***	***	***	***	***
Production	***	***	***	***	***	***	***
End-of-period inventories	***	***	***	***	***	***	***
Shipments:							
Home market shipments:							
Internal consumption/ transfers	***	***	***	***	***	***	***
Commercial home market shipments	***	***	***	***	***	***	***
Total home market shipments	***	***	***	***	***	***	***
Export shipments to:							
United States	***	***	***	***	***	***	***
All other markets	***	***	***	***	***	***	***
Total exports	***	***	***	***	***	***	***
Total shipments	***	***	***	***	***	***	***
	Ratios and shares (percent)						
Capacity utilization	***	***	***	***	***	***	***
Inventories/production	***	***	***	***	N/A	***	***
Inventories/total shipments	***	***	***	***	***	***	***
Share of shipments:							
Home market shipments:							
Internal consumption/ transfers	***	***	***	***	***	***	***
Commercial home market shipments	***	***	***	***	***	***	***
Total home market shipments	***	***	***	***	***	***	***
Export shipments to:							
United States	***	***	***	***	***	***	***
All other markets	***	***	***	***	***	***	***
Total exports	***	***	***	***	***	***	***
Total shipments	***	***	***	***	***	***	***
	Quantity (short tons contained silicon)						
Resales exported to the United States	***	***	***	***	***	***	***
Total export to the United States	***	***	***	***	***	***	***
	Ratios and shares (percent)						
Share of total exports to the United States:							
Exported by producers	***	***	***	***	***	***	***
Exported by resellers	***	***	***	***	***	***	***
Adjusted share of total shipments to the							
United States	***	***	***	***	***	***	***

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

Alternative products

Tau-Ken reported ***.

Exports

According to GTA, the leading export markets for silicon metal from Kazakhstan are the United States, Netherlands, and Poland (table VII-12). During 2019, the United States was the top export market for silicon metal from Kazakhstan, accounting for 42.4 percent, followed by the Netherlands, accounting for 19.3 percent, and Poland, accounting for 16.7 percent.

Table VII-12
Silicon metal: Kazakhstan exports by destination market, 2017-19

Destination market	Calendar year		
	2017	2018	2019
	Quantity (short tons contained silicon)		
United States	5,512	1,676	6,041
Netherlands	7,023	6,043	2,746
Poland	207	2,034	2,378
United Kingdom	1,327	1,867	1,261
Germany	662	1,002	747
Spain	---	106	717
Estonia	---	---	255
Canada	---	44	65
Czech Republic	741	369	23
All other destination markets	834	334	23
Total exports	16,306	13,475	14,255
	Value (1,000 dollars)		
United States	9,452	3,303	10,504
Netherlands	12,039	11,382	3,468
Poland	340	3,847	2,971
United Kingdom	2,060	3,317	1,663
Germany	625	1,478	697
Spain	---	204	918
Estonia	---	---	377
Canada	---	97	123
Czech Republic	1,180	706	30
All other destination markets	1,468	588	28
Total exports	27,166	24,921	20,779

Table continued on next page.

Table VII-12—Continued
Silicon metal: Kazakhstan exports by destination market, 2017-19

Destination market	Calendar year		
	2017	2018	2019
	Unit value (dollars per STCS)		
United States	1,715	1,971	1,739
Netherlands	1,714	1,883	1,263
Poland	1,641	1,892	1,249
United Kingdom	1,552	1,776	1,318
Germany	944	1,475	932
Spain	---	1,930	1,282
Estonia	---	---	1,481
Canada	---	2,191	1,896
Czech Republic	1,594	1,911	1,283
All other destination markets	1,759	1,762	1,227
Total exports	1,666	1,850	1,458
	Share of quantity (percent)		
United States	33.8	12.4	42.4
Netherlands	43.1	44.8	19.3
Poland	1.3	15.1	16.7
United Kingdom	8.1	13.9	8.8
Germany	4.1	7.4	5.2
Spain	---	0.8	5.0
Estonia	---	---	1.8
Canada	---	0.3	0.5
Czech Republic	4.5	2.7	0.2
All other destination markets	5.1	2.5	0.2
Total exports	100.0	100.0	100.0

Note.--Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. United States is shown at the top, all remaining top export destinations shown in descending order of 2019 data.

Source: Official exports statistics under HS subheading 2804.69 as reported by Customs Control Committee of the Ministry of Finance in the Global Trade Atlas database, accessed July 16, 2020.

The industry in Malaysia

The Commission issued foreign producers' or exporters' questionnaires to one firm believed to produce and/or export silicon metal from Malaysia.[23] The Commission received a usable questionnaire response from one firm: PMB Silicon Sdn Bhd ("PMB").[24] This firm's

[23] This firm was identified through a review of information submitted in the petition and contained in *** records.

[24] According to its website, PMB intends to have 72,000 metric tons of production capacity by the end of financial year 2020. http://www.pmbtechnology.com/pmbsilicon/.

exports to the United States accounted for *** U.S. imports of silicon metal from Malaysia in 2019.[25] According to estimates requested of the responding producer (PMB), its production of silicon metal in Malaysia reported in its questionnaire response accounts for *** production of silicon metal in Malaysia during 2019. Table VII-13 presents information on the silicon metal operations of PMB.

Table VII-13
Silicon metal: Summary data for PMB, 2019

Firm	Production (short tons contained silicon)	Share of reported production (percent)	Exports to the United States (short tons contained silicon)	Share of reported exports to the United States (percent)	Total shipments (short tons contained silicon)	Share of firm's total shipments exported to the United States (percent)
PMB	***	***	***	***	***	***
Total	***	***	***	***	***	***

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

Changes in operations

As presented in table VII-14, PMB reported operational and organizational changes since January 1, 2017.

Table VII-14
Silicon metal: PMB's reported changes in operations, since January 1, 2017

Item / Firm	Reported changed in operations
Plant openings:	
***	***.

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

Operations on silicon metal

Table VII-15 presents information on the silicon metal operations for PMB in Malaysia during 2017-19, January-March 2019, January-March 2020, and projections for 2020 and 2021.

PMB's capacity increased from *** in 2017 and 2018 to *** short tons in 2019, and was *** percent higher in interim 2020 than in interim 2019. The overall production increased from *** during 2017 and 2018 to *** short tons of silicon metal during 2019, and was *** percent higher during interim 2020 than in interim 2019. Capacity utilization was*** during 2017-18

[25] Based on official import statistics, imports of silicon metal from Malaysia totaled 3,894 short tons during 2019. PMB indicated ***.

and *** percent during 2019, while it was *** percentage points lower in interim 2020 than during interim 2019. During 2017-19, end-of-period inventories increased from *** during 2017 to *** short tons during 2019, while end-of-period inventories were higher by *** percent during interim 2020 than in interim 2019. Internal consumption/transfers were *** short tons during 2019 and were *** short tons during interim 2020 compared to *** during interim 2019.[26]

Total shipments of silicon metal, based on quantity, for PMB increased from *** during 2017-18 to *** short tons in 2019, and total shipments were higher during interim 2020 compared to interim 2019. Exports of silicon metal to the United States increased from *** during 2017-18 to *** short tons during 2019, and were higher by *** percent during interim 2020 than in interim 2019. Exports of silicon metal to all other markets increased from *** during 2017-18 to *** short tons during 2019. Export shipments to all other markets were higher during interim 2020 than in interim 2019. As a share of total shipments, exports to the United States accounted for *** percent during 2019, but were lower by *** percentage points during interim 2020 compared to interim 2019. Exports to all other markets as a share of total shipments accounted for *** percent during 2019, but were *** percentage points higher during interim 2020 than in interim 2019. Other export markets during 2019 identified by PMB included ***.[27] [28]

[26] Projections indicate that capacity and production ***, total shipments are projected to ***, export shipments to the United States are projected to *** and most other indicators ***.

[27] PMB foreign producer questionnaire response, section II-8.

[28] The primary export markets outside the United States during 2019 for PMB, which include percentages of exports to each country, are ***. Email Message from *** July 22, 2020.

Table VII-15
Silicon metal: Data for PMB, 2017-19, January-March 2019, January-March 2020, and projections for 2020 and 2021

Item	Actual experience					Projections	
	Calendar year			January to March		Calendar year	
	2017	2018	2019	2019	2020	2020	2021
	Quantity (short tons contained silicon)						
Capacity	***	***	***	***	***	***	***
Production	***	***	***	***	***	***	***
End-of-period inventories	***	***	***	***	***	***	***
Shipments:							
Home market shipments:							
Internal consumption/ transfers	***	***	***	***	***	***	***
Commercial home market shipments	***	***	***	***	***	***	***
Total home market shipments	***	***	***	***	***	***	***
Export shipments to:							
United States	***	***	***	***	***	***	***
All other markets	***	***	***	***	***	***	***
Total exports	***	***	***	***	***	***	***
Total shipments	***	***	***	***	***	***	***
	Ratios and shares (percent)						
Capacity utilization	***	***	***	***	***	***	***
Inventories/production	***	***	***	***	***	***	***
Inventories/total shipments	***	***	***	***	***	***	***
Share of shipments:							
Home market shipments:							
Internal consumption/ transfers	***	***	***	***	***	***	***
Commercial home market shipments	***	***	***	***	***	***	***
Total home market shipments	***	***	***	***	***	***	***
Export shipments to:							
United States	***	***	***	***	***	***	***
All other markets	***	***	***	***	***	***	***
Total exports	***	***	***	***	***	***	***
Total shipments	***	***	***	***	***	***	***
	Quantity (short tons contained silicon)						
Resales exported to the United States	***	***	***	***	***	***	***
Total export to the United States	***	***	***	***	***	***	***
	Ratios and shares (percent)						
Share of total exports to the United States:							
Exported by producers	***	***	***	***	***	***	***
Exported by resellers	***	***	***	***	***	***	***
Adjusted share of total shipments to the							
United States	***	***	***	***	***	***	***

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

Alternative products

PMB reported ***.

Exports

According to GTA, the leading export markets for silicon metal from Malaysia are the United States, Poland, and Japan (table VII-16). During 2019, the United States was the top export market for silicon metal from Malaysia, accounting for 51.7 percent, followed by Poland, accounting for 13.0 percent, and Japan, accounting for 12.3 percent.

Table VII-16
Silicon metal: Exports by destination market for Malaysia, 2017-19

Destination market	Calendar year		
	2017	2018	2019
	Quantity (short tons contained silicon)		
United States	---	0	5,040
Poland	---	---	1,270
Japan	19	1	1,201
Netherlands	---	---	754
Singapore	492	403	335
Slovenia	---	---	296
Spain	---	---	261
Germany	0	---	165
China	462	520	118
All other destination markets	748	742	304
Total exports	1,721	1,665	9,745
	Value (1,000 dollars)		
United States	---	8	7,803
Poland	---	---	1,742
Japan	101	3	1,660
Netherlands	---	---	1,112
Singapore	3,803	4,027	5,736
Slovenia	---	---	443
Spain	---	---	425
Germany	6	---	272
China	4,996	5,955	889
All other destination markets	1,749	1,619	632
Total exports	10,654	11,611	20,714

Table continued on next page.

Table VII-16--Continued
Silicon metal: Exports by destination market for Malaysia, 2017-19

Destination market	Calendar year		
	2017	2018	2019
	Unit value (dollars per STCS)		
United States	---	138,056	1,548
Poland	---	---	1,372
Japan	5,360	3,355	1,382
Netherlands	---	---	1,474
Singapore	7,726	10,005	17,109
Slovenia	---	---	1,497
Spain	---	---	1,631
Germany	55,187	---	1,645
China	10,824	11,456	7,501
All other destination markets	2,338	2,183	2,078
Total exports	6,192	6,974	2,126
	Share of quantity (percent)		
United States	---	0.0	51.7
Poland	---	---	13.0
Japan	1.1	0.0	12.3
Netherlands	---	---	7.7
Singapore	28.6	24.2	3.4
Slovenia	---	---	3.0
Spain	---	---	2.7
Germany	0.0	---	1.7
China	26.8	31.2	1.2
All other destination markets	43.5	44.5	3.1
Total exports	100.0	100.0	100.0

Note.--Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. United States is shown at the top, all remaining top export destinations shown in descending order of 2019 data.

Source: Official exports statistics under HS subheading 2804.69 as reported by Department of Statistics Malaysia in the Global Trade Atlas database, accessed July 16, 2020.

Subject countries combined

Table VII-17 presents summary data on silicon metal operations of the reporting subject producers in the subject countries during 2017-19, January-March 2019, January-March 2020, and projections for 2020 and 2021. During 2017-19, total capacity and total production for the combined subject producers more than doubled, but they were lower during interim 2020 than during interim 2019. End-of-period inventories for the combined subject producers increased by nearly 600 percent during 2017-19, and were higher by 12.8 percent during interim 2020 than in interim 2019. Exports to the United States increased by 79.9 percent during 2017-19, and were lower by 1.5 percent during interim 2020 than in interim 2019. Exports to all other markets and total exports for the combined subject producers both fluctuated, but increased

by 15.7 percent and 32.6 percent, respectively during 2017-19. Internal consumption/transfers, commercial home market shipments and total home market shipments all increased during 2017-19 and were higher during interim 2020 than in interim 2019. Combined capacity utilization fluctuated but decreased by 4.0 percentage points during 2017-19, but was higher by 13.0 percentage points during interim 2020 than in interim 2019. Export shipments to the United States as a share of total shipments increased by 5.4 percentage points during 2017-19, but were lower by 17.9 percentage points (to 23.3 percent) during interim 2020 than in interim 2019. Exports to all other markets as a share of total shipments decreased by 16.6 percentage points during 2017-19, but were higher by 15.3 percentage points during interim 2020 than in interim 2019. Total exports as a share of total shipments decreased by 11.2 percentage points during 2017-19, and were lower by 2.6 percentage points during interim 2020 than in interim 2019.

Table VII-17
Silicon metal: Data on the industry in subject countries, 2017-19, January-March 2019, January-March 2020, and projections for 2020 and 2021

Item	Actual experience					Projections	
	Calendar year			January to March		Calendar year	
	2017	2018	2019	2019	2020	2020	2021
	Quantity (short tons contained silicon)						
Capacity	58,604	79,180	124,657	26,894	20,193	89,822	70,128
Production	48,839	54,543	98,956	20,221	17,805	53,156	52,494
End-of-period inventories	3,478	6,845	24,086	8,611	9,717	14,870	2,090
Shipments:							
Home market shipments:							
Internal consumption/ transfers	---	827	8,371	539	719	9,204	15,196
Commercial home market shipments	20	335	829	10	1,071	4,440	13,224
Total home market shipments	20	1,162	9,200	549	1,790	13,644	28,420
Export shipments to:							
United States	14,421	10,787	25,947	7,605	7,493	14,331	3,747
All other markets	40,262	39,227	46,569	10,302	22,891	34,407	31,096
Total exports	54,683	50,014	72,516	17,907	30,384	48,738	34,843
Total shipments	54,703	51,176	81,716	18,456	32,174	62,382	63,263
	Ratios and shares (percent)						
Capacity utilization	83.3	68.9	79.4	75.2	88.2	59.2	74.9
Inventories/production	7.1	12.5	24.3	10.6	13.6	28.0	4.0
Inventories/total shipments	6.4	13.4	29.5	11.7	7.6	23.8	3.3
Share of shipments:							
Home market shipments:							
Internal consumption/ transfers	---	1.6	10.2	2.9	2.2	14.8	24.0
Commercial home market shipments	0.0	0.7	1.0	0.1	3.3	7.1	20.9
Total home market shipments	0.0	2.3	11.3	3.0	5.6	21.9	44.9
Export shipments to:							
United States	26.4	21.1	31.8	41.2	23.3	23.0	5.9
All other markets	73.6	76.7	57.0	55.8	71.1	55.2	49.2
Total exports	100.0	97.7	88.7	97.0	94.4	78.1	55.1
Total shipments	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Quantity (short tons contained silicon)						
Resales exported to the United States	---	---	---	---	---	---	---
Total export to the United States	14,421	10,787	25,947	7,605	7,493	14,331	3,747
	Ratios and shares (percent)						
Share of total exports to the United States:							
Exported by producers	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Exported by resellers	---	---	---	---	---	---	---
Adjusted share of total shipments to the							
United States	26.4	21.1	31.8	41.2	23.3	23.0	5.9

Note.--Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent.

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

U.S. inventories of imported merchandise

Table VII-18 presents data on U.S. importers' reported inventories of silicon metal during 2017-19, January-March 2019, and January-March 2020. Inventories of imports of silicon metal from Bosnia and Herzegovina *** during 2017-19, but were lower during interim 2020 than in interim 2019. Inventories of imports of silicon metal from Iceland were *** during 2017, but increased to *** short tons during 2019. Inventories of imports of silicon metal from Kazakhstan decreased by *** percent during 2017-19, but were higher during interim 2020 than in interim 2019. Inventories of imports of silicon metal from Malaysia increased from *** during 2017-18 to *** short tons during 2019, and were higher during interim 2020 than in interim 2019. Inventories of imports of silicon metal from the combined subject sources *** during 2017-19, and were *** during interim 2020 than in interim 2019. Inventories of imports of silicon metal from nonsubject sources decreased by *** percent during 2017-19, and were lower by *** percent during interim 2020 than in interim 2019. Inventories of imports of silicon metal from all import sources increased by *** percent during 2017-19, but were lower by *** percent during interim 2020 than in interim 2019.

Table VII-18
Silicon metal: U.S. importers' inventories, 2017-19, January-March 2019, and January-March 2020

*	*	*	*	*	*	*

U.S. importers' outstanding orders

The Commission requested importers to indicate whether they imported or arranged for the importation of silicon metal from Bosnia and Herzegovina, Iceland, Kazakhstan, and Malaysia after March 31, 2020. Arranged imports from Malaysia accounted for *** percent of total arranged imports from subject sources from April 2020 through March 2021. Nonsubject sources accounted for *** percent of total arranged imports during April 2020 through March 2021. Table VII-19 U.S. importers arranged imports from April 2020 through March 2021.

Table VII-19
Silicon metal: Arranged imports, April 2020 through March 2021

* * * * * * *

Antidumping or countervailing duty orders in third-country markets

There are no known current trade remedy actions on imports of silicon metal from any of the four subject countries in third-country markets. Bosnia and Herzegovina and Kazakhstan were subject countries in recent silicon metal antidumping and countervailing duty investigations in Canada and the European Union, but no duties were issued in either case.[29]

[29] Canadian International Trade Tribunal, *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.; Canadian International Trade Tribunal, *Silicon Metal,* Preliminary Injury Inquiry No. PI-2016-004, https://decisions.citt-tcce.gc.ca/citt-tcce/a/en/item/354761/index.do?q=silicon+metal+from+from+Brazil%2C+Kazakhstan%2C+Laos%2C+Malaysia%2C+Norway%2C+Russia%2C+and+Thailand, July 19, 2017. ; Canada Border Services Agency, *Certain Silicon Metal – Notice of Final Decisions,* https://www.cbsa-asfc.gc.ca/sima-lmsi/i-e/sm22017/sm22017-nf-eng.html, October 3, 2017.;Government of Canada, News Release,"Tribunal Finds no Injury nor Threat of Injury – Silicon Metal from Brazil, Kazakhstan, Laos, Malaysia, Norway, and Thailand" https://www.canada.ca/en/international-trade-tribunal/news/2017/11/tribunal_finds_noinjurynorthreatofinjurysiliconmetalfrombrazilka.html, November 2, 2017. ;European Commission, *Notice of initiation of an anti-dumping proceeding concerning imports of silicon originating in Bosnia and Herzegovina and in Brazil,* December 19, 2017, https://op.europa.eu/en/publication-detail/-/publication/0c3549ad-e498-11e7-9749-01aa75ed71a1/language-en/format-PDF.

Information on nonsubject countries

World Production

World production of silicon metal was estimated by the United States Geological Survey (USGS) to have been 3.33 million short tons in 2018,[30] excluding silicon metal produced in the United States.[31] CRU (a market research firm) estimated that world production of silicon metal was *** short tons in 2017, *** short tons in 2018, and *** short tons in 2019.[32] Table VII-20 presents silicon metal production by country. *** According to Roskill (a market research firm), global silicon metal capacity utilization was estimated at 51 percent in 2016, a marginal increase compared to that in recent years. Reportedly, the low utilization rate primarily reflected overcapacity and underutilization in China's silicon metal industry.[33] ***.[34] ***[35] ***[36]

[30] This is the most recent year that the USGS published world production data for silicon.

[31] USGS, 2018 Minerals Yearbook, Silicon Chapter, Advance data release of the 2018 annual tables, https://prd-wret.s3.us-west-2.amazonaws.com/assets/palladium/production/atoms/files/myb1-2018-simet-adv.xlsx (accessed July 20, 2020).

[32] Petition, Appendix, Exhibit 1-15 p. 65.; Figures have been converted into short tons and rounded to second decimal so may not reflect exact amounts.

[33] *Outlook for silicon metal diverges sharply from that for ferrosilicon*, Roskill Information Services Ltd., https://roskill.com/news/outlook-silicon-metal-diverges-sharply-ferrosilicon/ (accessed July 20, 2020).

[34] Petition, Appendix, Exhibit 1-15 p. 62.

[35] Petition, Appendix, Exhibit 1-15 p. 66.

[36] Petition, Appendix, Exhibit 1-15, pp. 63-64.

Table VII-20
Silicon Metal: Global production, by country, 2015-2019

*	*	*	*	*	*	*

Global exports

Table VII-21 presents the leading exporting countries of silicon metal from 2017 to 2019. Total world exports decreased by 2.7 percent by quantity and 3.8 percent by value from 2017 to 2019. China accounted for the largest share of global exports by quantity in 2019 (46.4 percent), followed by Norway, (13 percent), Brazil (12.6 percent), Netherlands (9.3 percent), and Australia (2.8 percent). In 2019, Brazil, Canada, and Norway were the leading nonsubject exporters of silicon metal to the United States.

Table VII-21
Silicon metal: Global exports by exporter, 2017-19

Exporter	Calendar year		
	2017	2018	2019
	Quantity (short tons contained silicon)		
United States	5,780	5,350	2,434
Bosnia-Herzegovina	---	---	---
Iceland	7,893	7,756	31,302
Kazakhstan	16,306	13,475	14,255
Malaysia	1,721	1,665	9,745
Subject exporters	31,700	28,246	57,735
All other major reporting exporters.-- China	911,887	898,767	765,555
Norway	204,178	199,821	214,456
Brazil	171,331	212,057	208,426
Netherlands	136,336	139,656	152,908
Australia	51,398	45,747	46,621
South Africa	10,400	39,340	32,639
Canada	26,871	32,366	32,563
Germany	20,031	20,898	23,512
Russia	17,155	27,193	17,164
All other exporters	115,812	123,224	98,861
All exporters	1,697,099	1,767,315	1,650,442
	Value (1,000 dollars)		
United States	9,253	8,638	3,752
Bosnia-Herzegovina	---	---	---
Iceland	13,977	5,875	31,174
Kazakhstan	27,166	24,921	20,779
Malaysia	10,654	11,611	20,714
Subject exporters	61,050	51,046	76,418
All other major reporting exporters.-- China	1,515,841	1,619,123	1,212,269
Norway	371,692	427,566	405,413
Brazil	343,766	477,410	435,423
Netherlands	249,270	292,987	297,252
Australia	92,988	102,716	92,601
South Africa	23,115	82,991	53,431
Canada	63,273	87,175	79,317
Germany	32,170	35,384	34,002
Russia	27,044	51,979	26,200
All other exporters	234,490	283,609	188,315
All exporters	3,014,700	3,511,987	2,900,642

Table continued on next page.

Table VII-21—Continued
Silicon metal: Global exports by exporter, 2017-19

Exporter	Calendar year		
	2017	2018	2019
	Unit value (dollars per STCS)		
United States	1,601	1,615	1,542
Bosnia-Herzegovina	---	---	---
Iceland	1,771	757	996
Kazakhstan	1,666	1,850	1,458
Malaysia	6,192	6,974	2,126
Subject exporters	1,926	1,807	1,324
All other major reporting exporters.--China	1,662	1,801	1,584
Norway	1,820	2,140	1,890
Brazil	2,006	2,251	2,089
Netherlands	1,828	2,098	1,944
Australia	1,809	2,245	1,986
South Africa	2,223	2,110	1,637
Canada	2,355	2,693	2,436
Germany	1,606	1,693	1,446
Russia	626	773	729
All other exporters	2,025	2,302	1,905
All exporters	1,776	1,987	1,757
	Share of quantity (percent)		
United States	0.3	0.3	0.1
Bosnia-Herzegovina	---	---	---
Iceland	0.5	0.4	1.9
Kazakhstan	1.0	0.8	0.9
Malaysia	0.1	0.1	0.6
Subject exporters	1.9	1.6	3.5
All other major reporting exporters.--China	53.7	50.9	46.4
Norway	12.0	11.3	13.0
Brazil	10.1	12.0	12.6
Netherlands	8.0	7.9	9.3
Australia	3.0	2.6	2.8
South Africa	0.6	2.2	2.0
Canada	1.6	1.8	2.0
Germany	1.2	1.2	1.4
Russia	1.0	1.5	1.0
All other exporters	6.8	7.0	6.0
All exporters	100.0	100.0	100.0

Note.--Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent.

Source: Official exports statistics under HS subheading 2804.69 reported by various national statistical authorities in the Global Trade Atlas database, accessed July 16, 2020.

The Industry in Brazil

Brazil was the largest nonsubject source of imports of silicon metal to the United States in 2019.[37] The United States was the largest destination market for Brazilian silicon metal in 2019, followed by the United Kingdom, and Germany in both value and volume. Table VII-22 presents data on Brazil's top export markets for silicon metal from 2017 to 2019. During that time, the U.S. share of Brazil's exports, by quantity, decreased by 11 percentage points, from 41.2 percent in 2017 to 30.2 percent in 2019.

Table VII-22
Silicon Metal: Brazil exports by destination market, 2017-19

Destination market	Calendar year		
	2017	2018	2019
	Quantity (short tons contained silicon)		
United States	70,544	40,933	62,989
United Kingdom	27,816	68,861	64,431
Germany	26,740	45,584	25,277
Japan	5,997	11,464	11,680
United Arab Emirates	---	---	11,023
Thailand	4,299	6,118	9,259
Canada	2,261	4,740	7,181
Poland	3,958	3,277	3,478
Netherlands	15,652	17,215	3,464
All other destination markets	14,065	13,866	9,644
Total exports	171,331	212,057	208,426
	Value (1,000 dollars)		
United States	155,676	100,258	139,354
United Kingdom	61,607	164,403	147,293
Germany	47,069	95,008	48,331
Japan	10,293	22,570	22,993
United Arab Emirates	---	---	17,044
Thailand	7,343	12,389	18,379
Canada	3,750	10,543	15,056
Poland	7,220	7,193	4,935
Netherlands	26,797	35,596	5,257
All other destination markets	24,010	29,450	16,782
Total exports	343,766	477,410	435,423

Table continued on next page.

[37] USITC Dataweb, HTS 2804.69.1000 and HTS 2804.69.5000, accessed July 22, 2020.

Table VII-22—Continued
Silicon Metal: Brazil exports by destination market, 2017-19

Destination market	Calendar year		
	2017	2018	2019
	Unit value (dollars per STCS)		
United States	2,207	2,449	2,212
United Kingdom	2,215	2,387	2,286
Germany	1,760	2,084	1,912
Japan	1,717	1,969	1,969
United Arab Emirates	---	---	1,546
Thailand	1,708	2,025	1,985
Canada	1,659	2,224	2,097
Poland	1,824	2,195	1,419
Netherlands	1,712	2,068	1,518
All other destination markets	1,707	2,124	1,740
Total exports	2,006	2,251	2,089
	Share of quantity (percent)		
United States	41.2	19.3	30.2
United Kingdom	16.2	32.5	30.9
Germany	15.6	21.5	12.1
Japan	3.5	5.4	5.6
United Arab Emirates	---	---	5.3
Thailand	2.5	2.9	4.4
Canada	1.3	2.2	3.4
Poland	2.3	1.5	1.7
Netherlands	9.1	8.1	1.7
All other destination markets	8.2	6.5	4.6
Total exports	100.0	100.0	100.0

Note.--Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. United States is shown at the top, all remaining top export destinations shown in descending order of 2019 data.
Source: Official exports statistics under HS subheading 2804.69 as reported by SECEX – Foreign Trade Secretariat in the Global Trade Atlas database, accessed July 16, 2020.

***[38] As of 2019, there were four silicon metal producers ***[39] in Brazil.[40] These firms are Palmyra do Brasil de Silício Metálico (formerly known as Dow Corning Silicio do Brasil), ***[41], Ligas de Aluminio S.A. ("LIASA"), Rima Industrial S.A. ("RIMA") ***, and Companhia Ferroligas Minas Gerais ("Minasligas"). ***[42]

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[38] ***.

[39] Petition, Appendix, Exhibit 1-15 p. 69.

[40] *Silicon Metal from Australia, Brazil, Kazakhstan, and Norway*, *Investigation Nos. 701-TA-567-569 and 731-TA-1343-1345 (Final)*, USITC Pub. 4773, April 2018, pp. VII-6-VII-7.

[41] Company has also been referred to as "Palmyra do Brasil de Silico Metálico" in certain publications.

[42] ***.

The Industry in Canada

Canada was the second largest nonsubject source of imports of silicon metal to the United States in 2019.[43] The United States was the largest destination market by quantity for Canadian silicon metal in 2019, accounting for nearly all of Canada's exports. Table VII-23 presents data on Canada's top export markets for silicon metal from 2017 to 2019. During that time, the U.S. share of Canada's exports, by quantity, increased by 3.4 percentage points, from 94.5 percent in 2017 to 97.9 percent in 2019.

[43] USITC Dataweb, HTS 2804.69.1000 and HTS 2804.69.5000, accessed July 22, 2020.

Table VII-23
Silicon metal: Canadian exports by destination market, 2017-19

Destination market	Calendar year		
	2017	2018	2019
	Quantity (short tons contained silicon)		
United States	25,396	30,157	31,869
Brazil	226	226	269
Germany	---	263	265
China	119	140	157
France	0	18	2
Mexico	1	1	1
Chile	---	---	0
Botswana	---	---	0
United Arab Emirates	---	0	0
All other destination markets	1,129	1,561	---
Total exports	26,871	32,366	32,563
	Value (1,000 dollars)		
United States	60,362	82,782	78,598
Brazil	273	274	313
Germany	---	181	218
China	141	167	183
France	0	21	3
Mexico	2	1	2
Chile	---	---	0
Botswana	---	---	0
United Arab Emirates	---	0	0
All other destination markets	2,495	3,748	---
Total exports	63,273	87,175	79,317

Table continued on next page.

Table VII-23—Continued
Silicon metal: Canadian exports by destination market, 2017-19

Destination market	Calendar year		
	2017	2018	2019
	Unit value (dollars per STCS)		
United States	2,377	2,745	2,466
Brazil	1,209	1,210	1,163
Germany	---	688	826
China	1,184	1,196	1,165
France	1,210	1,184	1,165
Mexico	1,140	1,183	1,160
Chile	---	---	1,170
Botswana	---	---	1,164
United Arab Emirates	---	1,183	1,144
All other destination markets	2,210	2,402	---
Total exports	2,355	2,693	2,436
	Share of quantity (percent)		
United States	94.5	93.2	97.9
Brazil	0.8	0.7	0.8
Germany	---	0.8	0.8
China	0.4	0.4	0.5
France	0.0	0.1	0.0
Mexico	0.0	0.0	0.0
Chile	---	---	0.0
Botswana	---	---	0.0
United Arab Emirates	---	0.0	0.0
All other destination markets	4.2	4.8	---
Total exports	100.0	100.0	100.0

Note.--Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. United States is shown at the top, all remaining top export destinations shown in descending order of 2019 data.
Source: Official exports statistics under HS subheading 2804.69 as reported by Statistics Canada in the Global Trade Atlas database, accessed July 22, 2020.

There is only one silicon metal producer in Canada, Quebec Silicon Limited Partnership ("QSLP"), owned jointly by GSM and Dow Corning, which operates a silicon metal plant in Bécancour, Québec.[44] ***.[45] ***[46] Between August and September 2019, two furnaces were idled at the QSLP plant and they remained in that state as of July 2020. These idlings were part

[44] *Silicon Metal from Australia, Brazil, Kazakhstan, and Norway*, *Investigation Nos. 701-TA-567-569 and 731-TA-1343-1345 (Final)*, USITC Pub. 4773, April 2018, p. VII-32.
[45] ***.
[46] ***.

of more widescale curtailments of silicon and ferrosilicon production made by parent company Ferroglobe in response to market conditions.[47]

[47] *Ferroglobe Provides Corporate Update*, Ferroglobe press release, October 4 ,2019, https://investor.ferroglobe.com/news-releases/news-release-details/ferroglobe-provides-corporate-update, retrieved on July 23, 2020.

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
85 FR 41063, July 8, 2020	*Silicon Metal from Bosnia and Herzegovina, Iceland, Kazakhstan, and Malaysia; Institution of Anti-Dumping and Countervailing Duty Investigations and Scheduling of Preliminary Phase Investigations*	https://www.govinfo.gov/content/pkg/FR-2020-07-08/pdf/2020-14625.pdf
85 FR 45177, July 27, 2020	*Silicon Metal from Bosnia and Herzegovina, Iceland, and Malaysia: Initiation of Less-Than-Fair-Value Investigations*	https://www.govinfo.gov/content/pkg/FR-2020-07-27/pdf/2020-16220.pdf
85 FR 45173, July 27, 2020	*Silicon Metal from the Republic of Kazakhstan: Initiation of Countervailing Duty Investigation*	https://www.govinfo.gov/content/pkg/FR-2020-07-27/pdf/2020-16221.pdf

APPENDIX B

LIST OF STAFF CONFERENCE WITNESSES

CALENDAR OF PRELIMINARY CONFERENCE

Those listed below participated in the United States International Trade Commission's preliminary conference. The Commission conducted its preliminary conference through submissions of written testimony and postconference briefs:

Subject: Silicon Metal from Bosnia and Herzegovina, Iceland, Kazakhstan, and Malaysia

Inv. Nos.: 701-TA-652 and 731-TA-1524-1526 (Preliminary)

Date: July 21, 2020

OPENING REMARKS:

In Support of Imposition (**Adam H. Gordon**, The Bristol Group, PLLC)

In Support of the Imposition of Antidumping and Countervailing Duty Orders:

The Bristol Group, PLLC
Washington, DC
on behalf of

Globe Specialty Metals, Inc.
Mississippi Silicon LLC

Chris Bowes, Sales Manager, North America, Ferroglobe PLC, Globe Specialty Metals, Inc.

Braulio Lage, Director, Mississippi Silicon LLC

Adam H. Gordon) – OF COUNSEL

In Opposition to the Imposition of Antidumping and Countervailing Duty Orders:

deKieffer & Horgan, PLLC
Washington, DC
on behalf of

PCC BakkiSilicon hf

Edwin Antonius Vermulst, Attorney, VVGB Advocaten

Juhi Sud, Attorney, VVGB Advocaten

Tobias Zuber, Attorney, VVGB Advocaten

John J. Kenkel) – OF COUNSEL

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

WACKER
München, Germany

Mary Beth Hudson, Vice President, Wacker Polysilicon North America

Dr. Martina Schulze-Adams, Raw Materials Procurement, WACKER Chemie AG

Gregory J. Brabec, Director Advocacy and Special Projects

Oliver Majumdar, Senior Manager Global Trade Affairs

-END-

APPENDIX C

SUMMARY DATA

Table C-1
Silicon metal: Summary data concerning the U.S. market, 2017-19, January to March 2019, and January to March 2020
(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			January to March		Comparison years			Jan-Mar
	2017	2018	2019	2019	2020	2017-19	2017-18	2018-19	2019-20
U.S. consumption quantity:									
Amount	360,492	318,113	301,739	88,136	74,994	▼(16.3)	▼(11.8)	▼(5.1)	▼(14.9)
Producers' share (fn1)	52.4	58.3	48.3	48.5	58.3	▼(4.1)	▲5.9	▼(10.0)	▲9.8
Importers' share (fn1):									
Bosnia-Hergzegovina	2.0	2.9	3.5	3.7	3.8	▲1.5	▲0.9	▲0.5	▲0.1
Iceland	0.4	0.4	2.3	2.0	2.0	▲1.9	▼(0.0)	▲1.9	▼(0.0)
Kazakhstan	2.9	1.0	2.8	2.7	0.5	▼(0.0)	▼(1.9)	▲1.9	▼(2.2)
Malaysia	0.0	---	1.3	---	2.5	▲1.3	▼(0.0)	▲1.3	▲2.5
Subject sources	5.3	4.3	9.9	8.4	8.8	▲4.6	▼(1.0)	▲5.6	▲0.4
Nonsubject sources	42.3	37.4	41.8	43.0	32.9	▼(0.4)	▼(4.9)	▲4.4	▼(10.1)
All import sources	47.6	41.7	51.7	51.5	41.7	▲4.1	▼(5.9)	▲10.0	▼(9.8)
U.S. consumption value:									
Amount	796,943	834,952	701,905	214,319	162,068	▼(11.9)	▲4.8	▼(15.9)	▼(24.4)
Producers' share (fn1)	53.5	58.6	49.4	49.2	61.5	▼(4.1)	▲5.2	▼(9.2)	▲12.3
Importers' share (fn1):									
Bosnia-Hergzegovina	1.9	2.6	2.9	3.1	2.7	▲1.0	▲0.7	▲0.3	▼(0.4)
Iceland	0.3	0.3	1.7	1.5	1.4	▲1.4	▼(0.0)	▲1.4	▼(0.2)
Kazakhstan	2.2	0.7	2.2	2.1	0.3	▼(0.0)	▼(1.5)	▲1.4	▼(1.8)
Malaysia	0.0	---	0.9	---	1.7	▲0.9	▼(0.0)	▲0.9	▲1.7
Subject sources	4.4	3.6	7.6	6.7	6.1	▲3.2	▼(0.8)	▲4.0	▼(0.6)
Nonsubject sources	42.1	37.8	43.0	44.0	32.4	▲0.8	▼(4.4)	▲5.2	▼(11.7)
All import sources	46.5	41.4	50.6	50.8	38.5	▲4.1	▼(5.2)	▲9.2	▼(12.3)
General U.S. imports (fn3).--:									
Bosnia-Hergzegovina:									
Quantity	7,211	9,350	10,493	3,237	2,818	▲45.5	▲29.7	▲12.2	▼(12.9)
Value	14,897	21,653	20,079	6,655	4,447	▲34.8	▲45.3	▼(7.3)	▼(33.2)
Unit value	$2,066	$2,316	$1,913	$2,056	$1,578	▼(7.4)	▲12.1	▼(17.4)	▼(23.2)
Ending inventory quantity	***	***	***	***	***	▲***	▲***	▲***	▼***
Iceland:									
Quantity	1,471	1,259	6,947	1,798	1,519	▲372.4	▼(14.4)	▲451.7	▼(15.5)
Value	2,413	2,369	11,711	3,278	2,221	▲385.3	▼(1.8)	▲394.3	▼(32.2)
Unit value	$1,641	$1,882	$1,686	$1,824	$1,463	▲2.7	▲14.7	▼(10.4)	▼(19.8)
Ending inventory quantity	***	***	***	***	***	▲***	▲***	▲***	▲***
Kazakhstan:									
Quantity	10,360	3,045	8,522	2,378	345	▼(17.7)	▼(70.6)	▲179.9	▼(85.5)
Value	17,466	6,064	15,171	4,487	518	▼(13.1)	▼(65.3)	▲150.2	▼(88.5)
Unit value	$1,686	$1,991	$1,780	$1,887	$1,504	▲5.6	▲18.1	▼(10.6)	▼(20.3)
Ending inventory quantity	***	***	***	***	***	▼***	▼***	▲***	▲***
Malaysia:									
Quantity	125	---	3,894	---	1,905	▲3,014.1	▼(100.0)	▲---	▲---
Value	179	---	6,595	---	2,743	▲3,588.5	▼(100.0)	▲---	▲---
Unit value	$1,430	---	$1,693	---	$1,440	▲18.4	▼(100.0)	▲---	▲---
Ending inventory quantity	***	***	***	***	***	▲***	***	▲***	▲***
Subject sources:									
Quantity	19,166	13,654	29,857	7,413	6,586	▲55.8	▼(28.8)	▲118.7	▼(11.1)
Value	34,955	30,086	53,556	14,420	9,930	▲53.2	▼(13.9)	▲78.0	▼(31.1)
Unit value	$1,824	$2,203	$1,794	$1,945	$1,508	▼(1.6)	▲20.8	▼(18.6)	▼(22.5)
Ending inventory quantity	***	***	***	***	***	▲***	▲***	▲***	▲***
Nonsubject sources:									
Quantity	152,344	118,966	126,190	37,937	24,671	▼(17.2)	▼(21.9)	▲6.1	▼(35.0)
Value	335,793	315,333	301,596	94,360	52,438	▼(10.2)	▼(6.1)	▼(4.4)	▼(44.4)
Unit value	$2,204	$2,651	$2,390	$2,487	$2,126	▲8.4	▲20.3	▼(9.8)	▼(14.5)
Ending inventory quantity	***	***	***	***	***	▼***	▼***	▲***	▼***
All import sources:									
Quantity	171,511	132,620	156,047	45,350	31,257	▼(9.0)	▼(22.7)	▲17.7	▼(31.1)
Value	370,748	345,419	355,152	108,781	62,368	▼(4.2)	▼(6.8)	▲2.8	▼(42.7)
Unit value	$2,162	$2,605	$2,276	$2,399	$1,995	▲5.3	▲20.5	▼(12.6)	▼(16.8)
Ending inventory quantity	***	***	***	***	***	▲***	▼***	▲***	▼***

Table continued.

Table C-1--Continued
Silicon metal: Summary data concerning the U.S. market, 2017-19, January to March 2019, and January to March 2020
(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			January to March		Comparison years			Jan-Mar
	2017	2018	2019	2019	2020	2017-19	2017-18	2018-19	2019-20
U.S. producers':									
Average capacity quantity	***	***	***	***	***	▼***	▼***	▼***	▲***
Production quantity	***	***	***	***	***	▼***	▼***	▼***	▲***
Capacity utilization (fn1)	***	***	***	***	***	▼***	▼***	▼***	▼***
U.S. shipments:									
Quantity	188,981	185,493	145,692	42,786	43,737	▼(22.9)	▼(1.8)	▼(21.5)	▲2.2
Value	426,195	489,533	346,753	105,538	99,700	▼(18.6)	▲14.9	▼(29.2)	▼(5.5)
Unit value	$2,255	$2,639	$2,380	$2,467	$2,280	▲5.5	▲17.0	▼(9.8)	▼(7.6)
Export shipments:									
Quantity	***	***	***	***	***	▼***	▼***	▲***	▼***
Value	***	***	***	***	***	▲***	▲***	▼***	▼***
Unit value	***	***	***	***	***	▲***	▲***	▼***	▲***
Ending inventory quantity	***	***	***	***	***	▼***	▲***	▼***	▼***
Inventories/total shipments (fn1)	7.1	8.3	6.1	5.9	4.0	▼(1.0)	▲1.2	▼(2.2)	▼(2.0)
Production workers	664	739	554	549	591	▼(16.6)	▲11.3	▼(25.0)	▲7.7
Hours worked (1,000s)	1,448	1,632	1,193	295	323	▼(17.6)	▲12.7	▼(26.9)	▲9.5
Wages paid ($1,000)	41,007	46,193	34,590	8,417	9,119	▼(15.6)	▲12.6	▼(25.1)	▲8.3
Hourly wages	$28.32	$28.30	$28.99	$28.53	$28.23	▲2.4	▼(0.1)	▲2.4	▼(1.1)
Productivity (STCS per 1,000 hours)	134.0	115.2	116.9	127.3	129.9	▼(12.7)	▼(14.0)	▲1.5	▲2.0
Unit labor costs	$211	$246	$248	$224	$217	▲17.3	▲16.3	▲0.9	▼(3.0)
Net sales:									
Quantity	189,083	185,575	145,779	42,808	43,740	▼(22.9)	▼(1.9)	▼(21.4)	▲2.2
Value	426,300	489,700	346,879	105,569	99,709	▼(18.6)	▲14.9	▼(29.2)	▼(5.6)
Unit value	$2,255	$2,639	$2,379	$2,466	$2,280	▲5.5	▲17.0	▼(9.8)	▼(7.6)
Cost of goods sold (COGS)	418,192	442,664	402,344	102,065	97,168	▼(3.8)	▲5.9	▼(9.1)	▼(4.8)
Gross profit or (loss) (fn2)	8,108	47,036	(55,465)	3,504	2,541	▼***	▲480.1	▼***	▼(27.5)
SG&A expenses	25,238	29,932	21,989	5,316	5,290	▼(12.9)	▲18.6	▼(26.5)	▼(0.5)
Operating income or (loss) (fn2)	(17,130)	17,104	(77,454)	(1,812)	(2,749)	▼***	▲***	▼***	▼***
Net income or (loss) (fn2)	(23,742)	10,172	(85,672)	(3,978)	(5,530)	▼***	▲***	▼***	▼***
Capital expenditures	***	***	***	***	***	▼***	▲***	▼***	▲***
Research and development expenses	***	***	***	***	***	***	***	***	***
Net assets	573,625	583,498	532,168	NA	NA	▼(7.2)	▲1.7	▼(8.8)	NA
Unit COGS	$2,212	$2,385	$2,760	$2,384	$2,221	▲24.8	▲7.9	▲15.7	▼(6.8)
Unit SG&A expenses	$133	$161	$151	$124	$121	▲13.0	▲20.8	▼(6.5)	▼(2.6)
Unit operating income or (loss) (fn2)	$(91)	$92	$(531)	$(42)	$(63)	▼---	▲***	▼***	▼***
Unit net income or (loss) (fn2)	$(126)	$55	$(588)	$(93)	$(126)	▼***	▲***	▼***	▼***
COGS/sales (fn1)	98.1	90.4	116.0	96.7	97.5	▲17.9	▼(7.7)	▲25.6	▲0.8
Operating income or (loss)/sales (fn1)	(4.0)	3.5	(22.3)	(1.7)	(2.8)	▼(18.3)	▲7.5	▼(25.8)	▼(1.0)
Net income or (loss)/sales (fn1)	(5.6)	2.1	(24.7)	(3.8)	(5.5)	▼(19.1)	▲7.6	▼(26.8)	▼(1.8)

Notes:

Note.--Shares and ratios shown as "0.0" percent represent non-zero values less than "0.05" percent (if positive) and greater than "(0.05)" percent (if negative). Zeroes, null values, and undefined calculations are suppressed and shown as "---". Period changes preceded by a "▲" represent an increase, while period changes preceded by a "▼" represent a decrease.

fn1.--Reported data are in percent and period changes are in percentage points.
fn2.--Percent changes only calculated when both comparison values represent profits; The directional change in profitability provided when one or both comparison values represent a loss.
fn3.--U.S. imports in this case are based on general U.S. imports, therefore the reported quantities and values include (1) goods immediately imported into consumption/ cleared through Customs upon arrival in the United States and (2) admissions into foreign trade zones (FTZs) and bonded warehouses regardless of whether those admissions were eventually cleared through Customs for consumption in the United States at a later date. General U.S. import values reflect Customs insurance and freight (CIF) values and not the full landed duty-paid value (LDPV) of U.S. imports for consumption. See part IV for further discussion of U.S. imports.

Source: Compiled from data submitted in response to Commission questionnaires and official U.S. import statistics using HTS statistical reporting numbers 2804.69.1000 and 2804.69.5000, accessed July 21, 2020.