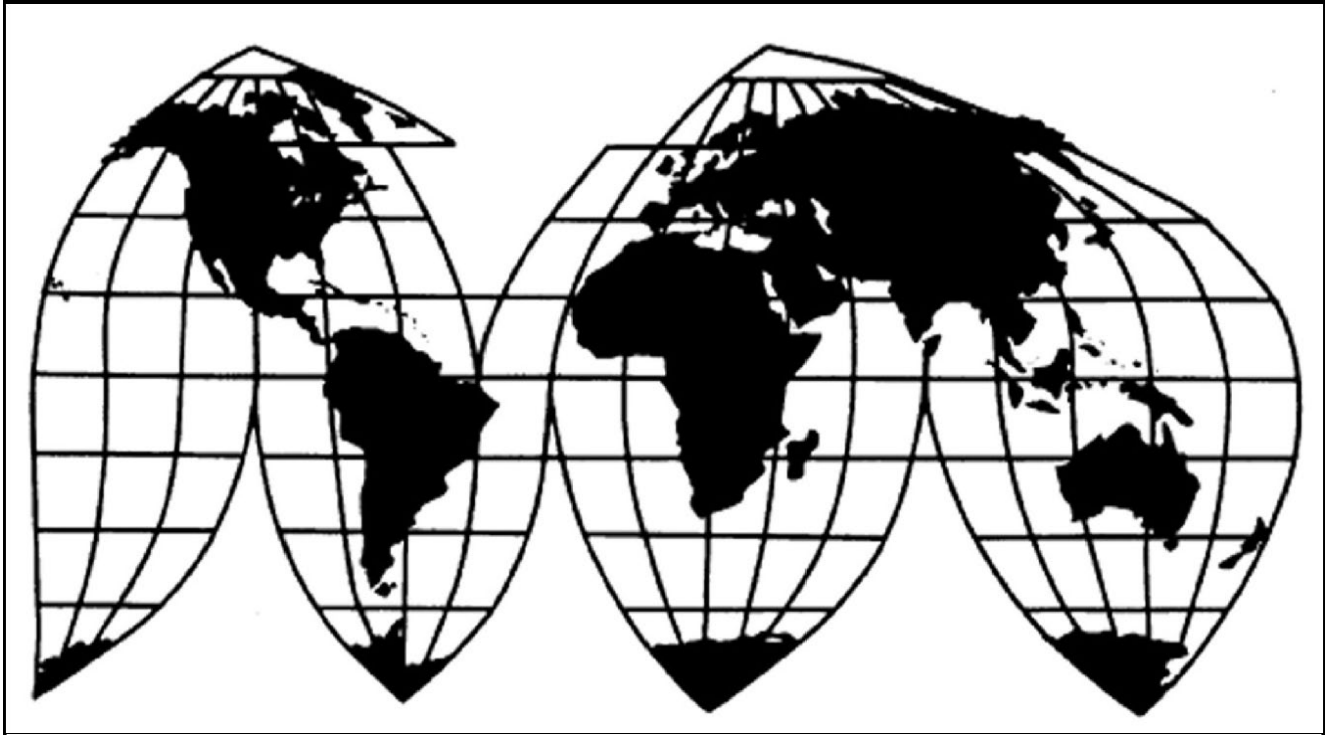
Large Power Transformers from South Korea

Investigation No. 731-TA-1189 (Second Review)

Publication 5531 **August 2024**

U.S. International Trade Commission



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U.S. International Trade Commission

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Additional contributions by Peter Stebbins, Investigator

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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UNITED STATES INTERNATIONAL TRADE COMMISSION

Investigation No. 731-TA-1189 (Second Review)

Large Power Transformers from South Korea

DETERMINATION

On the basis of the record[1] developed in the subject five-year review, the United States International Trade Commission ("Commission") determines, pursuant to the Tariff Act of 1930 ("the Act"), that revocation of the antidumping duty order on large power transformers from South Korea would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.

BACKGROUND

The Commission instituted this review on September 1, 2023 (88 FR 60496) and determined on December 5, 2023 that it would conduct a full review (88 FR 87457, December 18, 2023). Notice of the scheduling of the Commission's review and of a public hearing 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* on February 16, 2024 (89 FR 12379). The Commission conducted its hearing on June 20, 2024. All persons who requested the opportunity were permitted to participate.

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

Views of the Commission

Based on the record in this five-year review, we determine under section 751(c) of the Tariff Act of 1930, as amended ("the Tariff Act"), that revocation of the antidumping duty order on large power transformers ("LPTs") from South Korea would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.

I. Background

Original Investigation. On June 14, 2011, ABB Inc., Delta Star Inc., and Pennsylvania Transformer Technology Inc. filed an antidumping duty petition concerning imports of LPTs from South Korea. On August 24, 2012, the Commission determined that an industry in the United States was materially injured by reason of imports of LPTs from South Korea sold at less than fair value.[1] The Department of Commerce ("Commerce") published the antidumping duty order on LPTs from South Korea on August 31, 2012.[2]

First Five-Year Review. On July 3, 2017, the Commission instituted the first five-year review on LPTs from South Korea.[3] In September 2018, after conducting a full review, the Commission determined that revocation of the antidumping duty order on LPTs from South Korea would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.[4] Commerce issued a notice of continuation of the order on October 16, 2018.[5]

Current Review: On September 1, 2023, the Commission instituted the current five-year review of the order on LPTs from South Korea.[6] A joint response to the notice of institution was submitted by Delta Star Inc., Hitachi Energy USA Inc., Prolec-GE Waukesha, Inc., and

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[1] *Large Power Transformers from Korea*, Inv. No. 731-TA-1189 (Final), USITC Pub. 4346 (August 2012) ("*Original Determination*").

[2] *Large Power Transformers from the Republic of Korea: Antidumping Duty Order*, 77 Fed. Reg. 53177 (August 31, 2012).

[3] *Large Power Transformers from Korea: Institution of a Five-year Review*, 82 Fed. Reg. 30896 (July 3, 2017).

[4] *Large Power Transformers from Korea*, Inv. No. 731-TA-1189 (Review), USITC Pub. 4826 (September 2018) ("*First Five-Year Review*").

[5] *Large Power Transformers From the Republic of Korea: Continuation of Antidumping Duty Order*, 83 Fed. Reg. 52206 (Oct. 16, 2018).

[6] *Large Power Transformers From South Korea; Institution of a Five-Year Review*, 88 Fed. Reg. 60496 (Sept. 1, 2023).

Pennsylvania Transformer Technology, Inc. ("collectively, Domestic Producers"). The Commission received two joint responses from Respondents, one on behalf of HD Hyundai Electric Co., Ltd. ("HDHE") and HD Hyundai Electric America Corporation ("HD HEA"), and the other on behalf of Hyosung Heavy Industries Corp. ("HHIC") and Hyosung HICO, Ltd. ("Hyosung HICO"). On December 5, 2023, the Commission determined that the domestic interested party group response and the respondent interested party group response to its notice of institution were adequate. Accordingly, the Commission determined to conduct a full review.[7]

The Commission received joint prehearing and posthearing submissions, and final comments from Domestic Producers. Domestic Producers also participated in the hearing accompanied by counsel. The Commission received joint prehearing and posthearing submissions from foreign producers HDHE and HHIC, importer HD HEA, and domestic producer Hyosung HICO (collectively, "Respondents"). Respondents and their counsel also participated in the hearing.

In this review, U.S. industry data are based on the questionnaire responses of ten domestic producers, which accounted for the vast majority of domestic LPT production in 2023.[8] U.S. import data and related information are based on the questionnaire responses from 12 U.S. importers of LPTs that are estimated to have accounted for all or virtually all subject imports and a large majority of imports from nonsubject sources in 2023.[9] Foreign industry data and related information are based on the questionnaire responses of four producers of LPTs in South Korea, which accounted for virtually all of U.S. imports of LPTs from South Korea in 2023, as well as information from the original investigation and prior review, available information submitted by parties in this full review, and publicly available information, such as Global Trade Atlas ("GTA") data, gathered by staff.[10]

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[7] *Large Power Transformers From South Korea; Notice of Commission Determination To Conduct a Full Five-Year Review*, 88 Fed. Reg. 87457 (Dec. 18, 2023); *Confidential Staff Report*, Memorandum INV-WW-081 (July 17, 2024) as revised by Memorandum INV-WW-091 (July 30, 2024) ("CR") and *Large Power Transformers from South Korea*, Inv. No. 731-TA-1189 (Second Review), USITC Pub. 5531 (August 2024) ("PR") at I-1 n.4.

[8] CR/PR at I-9.

[9] CR/PR at I-9.

[10] CR/PR at I-9.

II. Domestic Like Product and Industry

A. Domestic Like Product

In making its determination under section 751(c) of the Tariff Act, the Commission defines the "domestic like product" and the "industry."[11] 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 under this subtitle."[12] The Commission's practice in five-year reviews is to examine the domestic like product definition from the original investigations and consider whether the record indicates any reason to revisit the prior findings.[13]

1. The Subject Merchandise

Commerce has defined the scope of the order in this five-year review as follows:

> The scope of this order covers large liquid dielectric power transformers (LPTs) having a top power handling capacity greater than or equal to 60,000 kilovolt amperes (60 megavolt amperes), whether assembled or unassembled, complete or incomplete.
>
> Incomplete LPTs are subassemblies consisting of the active part and any other parts attached to, imported with or invoiced with the active parts of LPTs. The "active part" of the transformer consists of one or more of the following when attached to or otherwise assembled with one another: the steel core or shell, the windings, electrical insulation between the windings, the mechanical frame for an LPT.

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[11] 19 U.S.C. § 1677(4)(A).

[12] 19 U.S.C. § 1677(10); *see*, *e.g.*, *Cleo Inc. v. United States*, 501 F.3d 1291, 1299 (Fed. Cir. 2007); *NEC Corp. v. Department of Commerce*, 36 F. Supp. 2d 380, 383 (Ct. Int'l Trade 1998); *Nippon Steel Corp. v. United States*, 19 CIT 450, 455 (1995); *Timken Co. v. United States*, 913 F. Supp. 580, 584 (Ct. Int'l Trade 1996); *Torrington Co. v. United States*, 747 F. Supp. 744, 748-49 (Ct. Int'l Trade 1990), *aff'd*, 938 F.2d 1278 (Fed. Cir. 1991); *see also* S. Rep. No. 249, 96th Cong., 1st Sess. 90-91 (1979).

[13] *See*, *e.g.*, *Internal Combustion Industrial Forklift Trucks from Japan*, Inv. No. 731-TA-377 (Second Review), USITC Pub. 3831 at 8-9 (Dec. 2005); *Crawfish Tail Meat from China*, Inv. No. 731-TA-752 (Review), USITC Pub. 3614 at 4 (July 2003); *Steel Concrete Reinforcing Bar from Turkey*, Inv. No. 731-TA-745 (Review), USITC Pub. 3577 at 4 (Feb. 2003).

> The product definition encompasses all such LPTs regardless of name designation, including but not limited to step-up transformers, step-down transformers, autotransformers, interconnection transformers, voltage regulator transformers, rectifier transformers, and power rectifier transformers.[14]

LPTs use electromagnetic induction between circuits to increase, decrease, or regulate power.[15] Power, as measured in volt-amperes, is typically transmitted at a high voltage and low current (amperage) because transmission at higher amperages requires more cable, resulting in greater power losses, and is more expensive.[16] Power is typically generated at less than 35 kV, increased for transmission to 69 to 765 kV (and the amperage reduced), then decreased for distribution to 15 to 34.5 kV (and the amperage increased).[17] LPTs are the equipment in the electric power grid that increase or decrease these voltages.[18] The users of LPTs include independent power producers; electric utilities, including investor-owned and public utilities; and industrial customers.[19] LPTs are expensive pieces of capital equipment and are expected to last 15 to 40 years, although their targeted lifespan is around 30 years.[20]

The "active part" of an LPT, where the electromagnetic induction occurs, consists of the core, the windings, and electrical insulation between the windings.[21] The core is made of very thin grain-oriented electrical steel ("GOES") coated with a glass film.[22] Around the core are wrapped thin strands of copper wire insulated with paper known as windings, forming the primary (input) and secondary (output) conductors.[23] As alternating current enters the core through the primary conductor, and then creates a fluctuating magnetic field that generates a

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[14] *Large Power Transformers From the Republic of Korea: Final Results of the Expedited Second Sunset Review of the Antidumping Duty Order*, 89 Fed. Reg. 330 (Jan. 3, 2024) and accompanying *Issues and Decision Memorandum for the Expedited Second Sunset Review of the Antidumping Duty Order on Large Power Transformers from the Republic of Korea*, December 27, 2023 at 2. The scope is substantively the same as the scope in the prior proceedings.

[15] CR/PR at I-17.

[16] CR/PR at I-22.

[17] CR/PR at I-22.

[18] CR/PR at I-22.

[19] CR/PR at I-24.

[20] CR/PR at I-15.

[21] CR/PR at I-18.

[22] CR/PR at I-18.

[23] CR/PR at I-18.

higher or lower voltage in the secondary conductor, which then exits the transformer.[24] The ratio of turns between the primary and secondary windings determines the output voltage, and the output voltage of an LPT can be adjusted by inserting taps into the winding either manually or automatically by a motor, thereby changing the ratio of turns between the primary and secondary windings.[25]

LPTs are produced as "single-phase" or "three-phase" models. A single-phase LPT has one set of primary and secondary windings wound around the core, while a three-phase LPT has three sets of primary and secondary windings wound around three core limbs.[26] Because the voltage of alternating current rises and falls along a sine wave, single-phase LPTs have their output interrupted periodically.[27] Three-phase LPTs provide continuous output because when the current stops in one phase of the transformer it continues to flow through the other two phases.[28]

There are two typical configurations of the core and windings of LPTs: the shell form and the core form.[29] In shell form LPTs, the windings are wound around a central leg of the magnetic core in a rectangular configuration, and the core extends around the windings to enclose them.[30] Shell form LPTs use more GOES than core types.[31] Because shell form LPTs are better able to withstand short circuits, purchasers prefer to use them in industrial applications prone to short circuiting, such as steel mills, and in very high voltage single phase LPTs.[32]

The active part of the transformer is placed inside of a metal tank filled with fluid, such as mineral oil, that dissipates heat generated by the transformer.[33] As the oil heats up, it circulates to a radiator, where it is cooled as the heat dissipates.[34] Fans and sometimes heat exchangers may help to cool the oil.[35] As the oil expands, it may travel to a separate tank, called an oil conservator, that is attached to a frame.[36]

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[24] CR/PR at I-18-19.
[25] CR/PR at I-18.
[26] CR/PR at I-20.
[27] CR/PR at I-20.
[28] CR/PR at I-20.
[29] CR/PR at I-20.
[30] CR/PR at I-20.
[31] CR/PR at I-20.
[32] CR/PR at I-20.
[33] CR/PR at I-21.
[34] CR/PR at I-21.
[35] CR/PR at I-21.
[36] CR/PR at I-21.

LPTs are connected to transmission lines with accordion-like cylinders known as bushings, which also insulate the tank.[37] A single phase transformer has four bushings, and a three phase unit has six bushings.[38] Other parts present in LPTs include tap changers, power cable connectors, gas-operated relays (to detect certain types of problems and minimize subsequent damage within the transformers), thermometers, pressure relief devices, dehydrating breathers, oil level indicators, and other controls.[39] LPTs also incorporate sensors that monitor a range of operating conditions, and related monitoring and control equipment and software that record data, automatically control certain functions, allow for remote monitoring, and perform condition analysis.[40]

The size of an LPT is determined by the load measured by megavolt-amperes ("MVAs"), the secondary output voltage, and the primary input voltage.[41] The MVA rating system is an industry standard, reflecting the maximum load that a transformer can handle without overheating in certain specified conditions.[42] Typically, customer requests for bids will specify the MVA for the transformer at 55 degrees Celsius and then one or two stages of forced cooling.[43] These ratings are displayed as three numbers, such as 115/153/192 MVA.[44] The first rating reflects for performance on an "oil natural, air natural" basis, with no additional cooling from fans, and the second and third ratings reflect performance with progressively more cooling added.[45] LPTs are "top-rated" at their highest MVA rating. Some LPTs that run at full capacity continuously have only a single MVA rating.[46]

2. The Original Investigation and First Five-Year Review

In the original investigation, petitioners urged the Commission to define a single domestic like product consisting of all LPTs within the scope of the investigation.[47] Respondents argued that the Commission should define two domestic like products

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[37] CR/PR at I-21.
[38] CR/PR at I-21.
[39] CR/PR at I-21.
[40] CR/PR at I-21.
[41] CR/PR at I-21.
[42] CR/PR at I-21
[43] CR/PR at I-21.
[44] CR/PR at I-21.
[45] CR/PR at I-22.
[46] CR/PR at I-22.
[47] *Original Determination*, USITC Pub. 4346 at 6.

corresponding to (1) 60-300 MVA top-rated power transformers for 345 kV high line system voltage, plus 60 MVA or more top-rated power transformers with high line voltage of less than 345 kV ("Category A") and (2) 60 MVA and above power transformers with a high line voltage of 500 kV or more plus LPTs above 300 MVA with a 345 kV high line voltage ("Category B").[48]

Based on an analysis of its traditional like product factors, the Commission rejected respondents' arguments and defined a single domestic like product coextensive with the scope. The Commission found that all LPTs within the scope were similar in terms of their physical characteristics and uses, channels of distribution, and manufacturing facilities, production processes, and production employees.[49] Specifically, the Commission found that all LPTs used electromagnetic induction between circuits to increase, decrease, or regulate power, and all possessed similar physical characteristics, including an "active part" consisting of the core, windings, and insulation.[50] While recognizing that larger LPTs may be considered more "critical" than smaller LPTs in that their failure would affect more customers, the Commission found no clear dividing line separating the end uses of small and large LPTs because either type could be considered "critical" in other respects, and used in nuclear power generation.[51] The Commission further found that all LPTs within the scope were sold to independent power producers and electric utilities and that three domestic producers produced Category A and B LPTs in the same facilities using the same production processes and employees.[52]

The Commission found some differences between Category A and Category B LPTs, but concluded that they did not outweigh the similarities.[53] Although customer perceptions of LPTs were mixed, the Commission found that most domestic producers perceived LPTs in Categories A and B to be similar, and that no industry standard or publication drew any distinction between LPTs in the two categories.[54] The Commission also found that a lack of interchangeability characterized the entire continuum of LPT products, not just LPTs in Categories A and B, given that LPTs built to different specifications are not interchangeable.[55]

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[48] *Original Determination*, USITC Pub. 4346 at 6.
[49] *Original Determination*, USITC Pub. 4346 at 6-8.
[50] *Original Determination*, USITC Pub. 4346 at 6-7.
[51] *Original Determination*, USITC Pub. 4346 at 7.
[52] *Original Determination*, USITC Pub. 4346 at 8.
[53] *Original Determination*, USITC Pub. 4346 at 9.
[54] *Original Determination*, USITC Pub. 4346 at 8-9.
[55] *Original Determination*, USITC Pub. 4346 at 8-9.

Similarly, the Commission found that LPT prices varied by specification, as would be expected of a continuum of products.[56]

Having found that the similarities between Category A and B LPTs outweighed their differences, the Commission defined a single domestic like product coextensive with the scope of the investigation.[57]

In the first five-year review, no party argued that the domestic like product definition in the original investigation should be revisited, and the record in that proceeding did not indicate any changes in the relevant facts. Consequently, the Commission again defined the domestic like product as all LPTs, coextensive with the scope of the order.[58]

3. The Current Review

In this second five-year review, Domestic Producers agree with the domestic like product definition adopted by the Commission in the prior proceedings.[59] Respondents took no position on this issue. There is no new information in the record indicating that the pertinent characteristics or uses of LPTs have changed since the prior review that would warrant revisiting the definition of the domestic like product.[60] We therefore again define a single domestic like product consisting of all LPTs, coextensive with the scope of the order.

B. Domestic Industry

Section 771(4)(A) of the Tariff Act defines the relevant industry 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."[61] 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.

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[56] *Original Determination*, USITC Pub. 4346 at 8-9.

[57] *Original Determination*, USITC Pub. 4346 at 9.

[58] *First Five-Year Review*, USITC Pub. 4826 at 8-9.

[59] Domestic Producers' Prehearing Br. at 6; CR/PR at I-32.

[60] *See generally* CR/PR at I-15-32.

[61] 19 U.S.C. § 1677(4)(A). The definitions in 19 U.S.C. § 1677 are applicable to the entire subtitle containing the antidumping and countervailing duty laws, including 19 U.S.C. §§ 1675 and 1675a. *See* 19 U.S.C. § 1677.

1. The Original Investigation and First Five-Year Review

In the original investigation, the Commission defined the domestic industry to include all domestic producers of LPTs.[62] There were no related party issues.[63]

In the first five-year review, the Commission found a domestic producer, HD Hyundai Power Transformers USA ("HD HPT USA"),[64] to be a related party because it was related to *** a South Korean LPT producer and a U.S. importer of subject merchandise.[65] The Commission found that HD HPT USA's primary interest was in domestic production of LPTs rather than importation, and that there was no evidence that it benefited from its status as a related party. Accordingly, the Commission concluded that appropriate circumstances did not exist to exclude it from the domestic industry.[66]

2. The Current Review

In this review, we must determine whether any producer of the domestic like product should be excluded from the domestic industry pursuant to section 771(4)(B) of the Tariff Act. This provision allows the Commission, if appropriate circumstances exist, to exclude from the domestic industry producers that are related to an exporter or importer of subject merchandise or which are themselves importers.[67] Exclusion of such a producer is within the Commission's discretion based upon the facts presented in each investigation.[68]

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[62] *Original Determination*, USITC Pub. 4346 at 9.

[63] *Original Determination*, USITC Pub. 4346 at 9 n.55.

[64] In the first review, HD Hyundai Power Transformers USA was referred to as HYPO. *First Five-Year Review*, USITC Pub. 4826 at 9-11.

[65] *First Five-Year Review*, USITC Pub. 4826 at 9.

[66] *First Five-Year Review*, USITC Pub. 4826 at 10-11.

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

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

(1) the percentage of domestic production attributable to the importing producer;

(2) the reason the U.S. producer has decided to import the product subject to investigation (whether the firm benefits from the LTFV sales or subsidies or whether the firm must import in order to enable it to continue production and compete in the U.S. market);

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

(Continued…)

a) Arguments of the Parties

Domestic Producers argue that the Commission should define the domestic industry as all U.S. producers of LPTs, as it did in the prior proceedings. They argue that HD HPT USA and Hyosung HICO, U.S. affiliates of South Korean producers, ***, and that, therefore, exclusion of either company is not warranted in this case.[69]

Respondents do not support exclusion of Hyosung HICO or HD HPT USA from the domestic industry. They assert that Hyosung HICO and HD HPT USA's primary interest is in U.S. production of LPTs rather than importation, the two companies' domestic production exceeds their affiliate's subject imports, and both companies have invested in expanding their U.S. production capacity during the POR and continue to invest.[70]

b) Analysis

U.S. producer *** qualifies as a related party because it is ***.[71] *** also qualifies as a related party because it is ***.[72]

***. *** was the *** domestic producer in 2023, accounting for *** percent of domestic industry production.[73] It *** the continuation of the order in this review.[74] *** during the period of review ("POR"), ***.[75] The ratio of affiliate *** imports of LPTs from South Korea to *** domestic production of LPTs increased from *** in 2021 to *** percent in 2022 and *** percent in 2023.[76] *** indicated that the reason for importing subject product is that

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(…Continued)

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

(5) whether the primary interest of the importing producer lies in domestic production or importation. *Changzhou Trina Solar Energy Co. v. USITC*, 100 F. Supp.3d 1314, 1326-31 (Ct. Int'l. Trade 2015), *aff'd*, 839 F.3d 1377 (Fed. Cir. 2018); *see also Torrington Co. v. United States*, 790 F. Supp. at 1168.

[69] Domestic Producers' Prehearing Br. at 7-9.

[70] Respondents' Posthearing Br., Exhibit 1 at 67.

[71] CR/PR at Table I-11.

[72] CR/PR at Table I-11; *** U.S. Producer Questionnaire at Question I-5; *** U.S. Importer Questionnaire at Question II-5a. While *** is also related to U.S. importer ***, the latter firm did not import any subject LPTs during the 2021-2023 period. *** U.S. Importer Questionnaire at Question II-5a.

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

[74] CR/PR at Table I-10.

[75] CR/PR at III-23 n.9, Table I-11.

[76] CR/PR at Table III-17.

"***."[77] *** reported significant capital expenditures during the 2021-2023 period, including a ***.[78]

While *** affiliate *** imported increasing volumes of subject merchandise from 2021 to 2023, *** domestic production greatly exceeded the volume of subject imports by *** over the same period. Moreover, *** was the *** domestic producer of LPTs in 2023 and it *** and the ratio of its affiliated importer's subject imports to its domestic production was low throughout the POR.[79] Further, the record does not indicate that *** ownership of *** benefited *** domestic production operations such that its inclusion in the domestic industry would mask injury for the industry as a whole. Indeed, as the *** U.S. producer, *** exclusion would skew the industry data. We therefore determine that appropriate circumstances do not exist to exclude *** from the domestic industry as a related party.

***. *** began operations *** that its parent company, ***.[80] It *** the continuation of the order in this review.[81] *** reported making significant investments to replace and upgrade equipment and convert the facility to ***.[82] *** capacity increased from *** MVA in 2021 to *** MVA in 2023, making it the *** domestic producer in 2023, accounting for *** percent of domestic industry production.[83] *** projects its capacity to increase to *** MVA in 2024 and *** MVA in 2025, and eventually *** MVA by 2027.[84] ***.[85] The ratio of affiliate *** imports of LPTs from South Korea to *** domestic production of LPTs decreased irregularly

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[77] CR/PR at Table III-19.

[78] CR/PR at Table III-2. *** ratios were *** than the domestic industry average in 2021, 2022, and 2023. CR/PR at Table G-1.

[79] Commissioner Kearns finds that the record is mixed as to whether ***'s primary interest lies in domestic production. Between 2022 and 2023, the firm's supply of LPTs to the U.S. market underwent a dramatic shift from U.S. production to its affiliate's subject imports. In 2023, the firm's U.S. production declined as its affiliate's subject imports increased *** from the prior year; the firm's ratio of domestic production to subject imports correspondingly increased from *** percent in 2022 to *** percent in 2023. CR/PR at Table III-17. While the firm explained these imports were due to ***, Commissioner Kearns notes that ***. CR/PR at Table III-19; ***. Notwithstanding this mixed record on the firm's primary interest, Commissioner Kearns finds that the firm's exclusion from the domestic industry would skew the industry's data because the firm is the *** domestic producer. Accordingly, Commissioner Kearns concurs with the majority's finding that there are not appropriate circumstances to exclude this firm.

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

[81] CR/PR at Table I-10.

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

[83] CR/PR at Tables III-5, I-10.

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

[85] CR/PR at III-23 n.9, Table I-11.

from *** percent in 2021 to *** percent in 2022, and *** percent in 2023.[86] *** indicated that the reason *** imported subject merchandise was ***.[87]

*** was the *** largest domestic producer of LPTs in 2023, increased its domestic production relative to its affiliate's subject imports during the POR, and plans significant expansion of its capacity. Although *** continuation of the order, no party has argued that *** should be excluded from the definition of the domestic industry. Nor is there any evidence that *** domestic operations have benefitted from its status as a related party such that its inclusion in the domestic industry would mask injury to the domestic industry as a whole. Indeed, given that the firm is the *** domestic producer, its exclusion from the domestic industry would skew the data. We therefore determine that appropriate circumstances do not exist to exclude *** from the domestic industry as a related party.

Therefore, consistent with our definition of the domestic like product, and absent any argument to the contrary, we again define the domestic industry as all domestic producers of LPTs.

III. Whether Revocation of the Antidumping Duty Order Would Likely Lead to Continuation or Recurrence of Material Injury Within a Reasonably Foreseeable Time

A. Legal Standards

In a five-year review conducted under section 751(c) of the Tariff Act, Commerce will revoke an antidumping or countervailing duty order unless: (1) it makes a determination that dumping or subsidization is likely to continue or recur and (2) the Commission makes a determination that revocation of the antidumping or countervailing duty order "would be likely to lead to continuation or recurrence of material injury within a reasonably foreseeable time."[88] The SAA states that "under the likelihood standard, the Commission will engage in a counterfactual analysis; it must decide the likely impact in the reasonably foreseeable future of an important change in the status quo – the revocation or termination of a proceeding and the

[86] CR/PR at Table III-18.

[87] CR/PR at Table III-19. *** ratios were *** than the domestic industry average in 2021, 2022, and 2023. CR/PR at Table G-1.

[88] 19 U.S.C. § 1675a(a).

elimination of its restraining effects on volumes and prices of imports."[89] Thus, the likelihood standard is prospective in nature.[90] The U.S. Court of International Trade ("CIT") has found that "likely," as used in the five-year review provisions of the Act, means "probable," and the Commission applies that standard in five-year reviews.[91]

The statute states that "the Commission shall consider that the effects of revocation or termination may not be imminent, but may manifest themselves only over a longer period of time."[92] According to the SAA, a "'reasonably foreseeable time' will vary from case-to-case, but normally will exceed the 'imminent' timeframe applicable in a threat of injury analysis in original investigations."[93]

Although the standard in a five-year review is not the same as the standard applied in an original investigation, it contains some of the same fundamental elements. The statute provides that the Commission is to "consider the likely volume, price effect, and impact of imports of the subject merchandise on the industry if the orders are revoked or the suspended

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[89] SAA at 883-84. The SAA states that "{t}he likelihood of injury standard applies regardless of the nature of the Commission's original determination (material injury, threat of material injury, or material retardation of an industry). Likewise, the standard applies to suspended investigations that were never completed." *Id*. at 883.

[90] While the SAA states that "a separate determination regarding current material injury is not necessary," it indicates that "the Commission may consider relevant factors such as current and likely continued depressed shipment levels and current and likely continued {sic} prices for the domestic like product in the U.S. market in making its determination of the likelihood of continuation or recurrence of material injury if the order is revoked." SAA at 884.

[91] *See NMB Singapore Ltd. v. United States*, 288 F. Supp. 2d 1306, 1352 (Ct. Int'l Trade 2003) ("'likely' means probable within the context of 19 U.S.C. § 1675(c) and 19 U.S.C. § 1675a(a)"), *aff'd mem.*, 140 Fed. Appx. 268 (Fed. Cir. 2005); *Nippon Steel Corp. v. United States*, 26 CIT 1416, 1419 (2002) (same); *Usinor Industeel, S.A. v. United States*, 26 CIT 1402, 1404 nn.3, 6 (2002) ("more likely than not" standard is "consistent with the court's opinion;" "the court has not interpreted 'likely' to imply any particular degree of 'certainty'"); *Indorama Chemicals (Thailand) Ltd. v. United States*, 26 CIT 1059, 1070 (2002) ("standard is based on a likelihood of continuation or recurrence of injury, not a certainty"); *Usinor v. United States*, 26 CIT 767, 794 (2002) ("'likely' is tantamount to 'probable,' not merely 'possible'").

[92] 19 U.S.C. § 1675a(a)(5).

[93] SAA at 887. Among the factors that the Commission should consider in this regard are "the fungibility or differentiation within the product in question, the level of substitutability between the imported and domestic products, the channels of distribution used, the methods of contracting (such as spot sales or long-term contracts), and lead times for delivery of goods, as well as other factors that may only manifest themselves in the longer term, such as planned investment and the shifting of production facilities." *Id*.

investigation is terminated."[94] It directs the Commission to take into account its prior injury determination, whether any improvement in the state of the industry is related to the order or the suspension agreement under review, whether the industry is vulnerable to material injury if an order is revoked or a suspension agreement is terminated, and any findings by Commerce regarding duty absorption pursuant to 19 U.S.C. § 1675(a)(4).[95] The statute further provides that the presence or absence of any factor that the Commission is required to consider shall not necessarily give decisive guidance with respect to the Commission's determination.[96]

In evaluating the likely volume of imports of subject merchandise if an order under review is revoked and/or a suspended investigation is terminated, the Commission is directed to consider whether the likely volume of imports would be significant either in absolute terms or relative to production or consumption in the United States.[97] In doing so, the Commission must consider "all relevant economic factors," including four enumerated factors: (1) any likely increase in production capacity or existing unused production capacity in the exporting country; (2) existing inventories of the subject merchandise, or likely increases in inventories; (3) the existence of barriers to the importation of the subject merchandise into countries other than the United States; and (4) 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.[98]

In evaluating the likely price effects of subject imports if an order under review is revoked and/or a suspended investigation is terminated, the Commission is directed to consider whether there is likely to be significant underselling by the subject imports as compared to the domestic like product and whether the subject imports are likely to enter the United States at prices that otherwise would have a significant depressing or suppressing effect on the price of the domestic like product.[99]

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[94] 19 U.S.C. § 1675a(a)(1).

[95] 19 U.S.C. § 1675a(a)(1). Commerce has not made any duty absorption findings concerning LPT from South Korea during the POR. CR/PR at I-10 n.15.

[96] 19 U.S.C. § 1675a(a)(5). Although the Commission must consider all factors, no one factor is necessarily dispositive. SAA at 886.

[97] 19 U.S.C. § 1675a(a)(2).

[98] 19 U.S.C. § 1675a(a)(2)(A-D).

[99] *See* 19 U.S.C. § 1675a(a)(3). The SAA states that "{c}onsistent with its practice in investigations, in considering the likely price effects of imports in the event of revocation and termination, the Commission may rely on circumstantial, as well as direct, evidence of the adverse effects of unfairly traded imports on domestic prices." SAA at 886.

In evaluating the likely impact of imports of subject merchandise if an order under review is revoked and/or a suspended investigation is terminated, the Commission is directed to consider all relevant economic factors that are likely to have a bearing on the state of the industry in the United States, including but not limited to the following: (1) likely declines in output, sales, market share, profits, productivity, return on investments, and utilization of capacity; (2) likely negative effects on cash flow, inventories, employment, wages, growth, ability to raise capital, and investment; and (3) likely negative effects on the existing development and production efforts of the industry, including efforts to develop a derivative or more advanced version of the domestic like product.[100] All relevant economic factors are to be considered within the context of the business cycle and the conditions of competition that are distinctive to the industry. As instructed by the statute, we have considered the extent to which any improvement in the state of the domestic industry is related to the orders under review and whether the industry is vulnerable to material injury upon revocation.[101]

B. Conditions of Competition and the Business Cycle

In evaluating the likely impact of the subject imports on the domestic industry if an order is revoked, the statute directs the Commission to consider all relevant economic factors "within the context of the business cycle and conditions of competition that are distinctive to the affected industry."[102] The following conditions of competition inform our determination.

1. The Original Investigation and First Five-Year Review

a) Demand Conditions

In the original investigation, the Commission found that overall U.S. demand for LPTs varied with the general economic cycle of the United States, driven by demand for electric power, industrial construction and housing starts, and federal incentives for renewable energy

[100] 19 U.S.C. § 1675a(a)(4).

[101] The SAA states that in assessing whether the domestic industry is vulnerable to injury if the order is revoked, the Commission "considers, in addition to imports, other factors that may be contributing to overall injury. While these factors, in some cases, may account for the injury to the domestic industry, they may also demonstrate that an industry is facing difficulties from a variety of sources and is vulnerable to dumped or subsidized imports." SAA at 885.

[102] 19 U.S.C. § 1675a(a)(4).

sources.[103] During the 2009 to 2011 period, apparent U.S. consumption of LPTs increased irregularly, with no clear demand trend.[104]

In the first five-year review, the Commission again found that LPT demand was influenced by U.S. electricity demand, industrial construction, and housing starts, but also driven by the need to replace aging infrastructure and by the construction of new power generation facilities and transmission lines.[105] From 2012 to 2017, apparent U.S. consumption of LPTs increased irregularly.[106] Market participants' responses were mixed regarding future demand for LPTs in the United States.[107] A 2018 report by the U.S. Energy Information Administration projected electricity demand would rise slowly until 2050.[108] The Commission found that LPT demand growth could be potentially restrained by the use of monitoring technology, which could extend the useful life of LPTs by permitting utilities to replace them when necessary instead of at an arbitrary age.[109]

b) Supply Conditions

In the original investigation, the Commission found that the U.S. market was supplied by six domestic producers, subject imports, and nonsubject imports.[110] Of these sources, subject imports were the largest source of LPTs in 2010 and interim 2011, nonsubject imports were the largest source in 2009, 2011, and interim 2012, and domestic producers were the smallest source throughout the original period of investigation.[111] In November 2011, HD HPT USA, a wholly owned subsidiary of HHIC, a South Korean producer, opened a $108 million LPT production facility in Montgomery, Alabama.[112]

In the first five-year review, the Commission found the U.S. market was supplied by seven domestic producers, subject imports, and nonsubject imports.[113] Nonsubject imports supplied the largest share of apparent U.S. consumption in 2017, followed by the domestic

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[103] *Original Determination*, USITC Pub. 4346 at 13.
[104] *Original Determination*, USITC Pub. 4346 at 13.
[105] *First Five-Year Review*, USITC Pub. 4826 at 15.
[106] *First Five-Year Review*, USITC Pub. 4826 at 16.
[107] *First Five-Year Review*, USITC Pub. 4826 at 16.
[108] *First Five-Year Review*, USITC Pub. 4826 at 16.
[109] *First Five-Year Review*, USITC Pub. 4826 at 16.
[110] *Original Determination*, USITC Pub. 4346 at 14.
[111] *Original Determination*, USITC Pub. 4346 at 14.
[112] *Original Determination*, USITC Pub. 4346 at 14.
[113] *First Five-Year Review*, USITC Pub. 4826 at 16.

industry, and subject imports.[114] Mitsubishi opened an LPT production facility, Caravels/Georgia Transformer Corp. purchased the Efacec LPT production facility, and ABB closed a production facility during the review period.[115] The Commission found that South Korea was the largest single country source of U.S. imports of LPTs in 2017.[116]

c) Substitutability and Other Conditions

In the original investigation, the Commission found that domestic and subject imported LPTs meeting the same specifications were highly substitutable, with each LPT built to order.[117] The Commission explained that in purchasing LPTs, purchasers generally requested highly detailed quotes from prequalified or certified suppliers, and generally provided such suppliers with one opportunity to bid on a particular contract.[118] Purchasers assessed quotes based on both the initial cost and the total evaluated cost, comprised of the initial cost plus losses, of the LPTs.[119] Price was an important factor in purchasing decisions, but non-price factors such as meeting specifications and quality were important as well.[120]

Several other conditions of competition informed the Commission's analysis in the original investigation. The Commission found that lead times averaged eight to 11 months for domestic producers and nine to 14 months for importers.[121] Due to these long lead times and the custom-made nature of LPTs, inventories consisted of finished units in transit, rather than volume available for future sale.[122] Finally, the Commission observed that large investor-owned utilities established long-term alliances (lasting from two to five years) with particular suppliers using blanket agreements, alliance agreements, framework agreements, or memoranda of understanding.[123] While not guaranteeing sales, such agreements increased a supplier's likelihood of winning bids from a utility, while helping the utility more rapidly to acquire

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[114] *First Five-Year Review*, USITC Pub. 4826 at 16.
[115] *First Five-Year Review*, USITC Pub. 4826 at 17.
[116] *First Five-Year Review*, USITC Pub. 4826 at 17.
[117] *Original Determination*, USITC Pub. 4346 at 14.
[118] *Original Determination*, USITC Pub. 4346 at 15.
[119] *Original Determination*, USITC Pub. 4346 at 15.
[120] *Original Determination*, USITC Pub. 4346 at 15.
[121] *Original Determination*, USITC Pub. 4346 at 15.
[122] *Original Determination*, USITC Pub. 4346 at 15.
[123] *Original Determination*, USITC Pub. 4346 at 16.

additional units of the LPTs subject to the agreement. Sales pursuant to alliance agreements reportedly accounted for a significant percentage of LPT sales.[124]

In the first five-year review, the Commission again found a high degree of substitutability between subject imports and domestically produced LPTs of the same specifications.[125] The Commission also found that price continued to be an important factor in purchasing decisions, although non-price factors such as quality, price, and lead time/delivery, were also important.[126] Purchasers continued to purchase LPTs under alliance agreements or blanket agreements.[127] The Commission also found there was some transparency with respect to competing bid prices and the identity of competitors in bidding events, although most responding purchasers reported that they do not quote competing prices during negotiations.[128] It also found that raw material prices either fluctuated or increased and anticipated that raw material prices would increase in the reasonably foreseeable future.[129]

2. The Current Review

a) Demand Conditions

Demand for LPTs is driven by the need to replace aging infrastructure and construction of new generation facilities and transmission lines.[130] Additions to utility-scale power plants fluctuated during the period of review, declining overall from 31.3 gigawatts ("GW") in 2018 to 30.5 GW in 2022, and primarily consisted of new solar generation, natural gas, and wind capacity.[131] Investments by investor-owned utilities in power transmission increased steadily during the period from $22.2 billion in 2018 to $26.7 billion in 2022.[132] The largest increase in newly installed electricity generation over the period came from renewable energy generation, which added more than 100 GW of new capacity between 2018 and 2022.[133] LPT demand is also influenced by U.S. electricity demand and industrial construction, including of new data

[124] *Original Determination*, USITC Pub. 4346 at 16.
[125] *First Five-Year Review*, USITC Pub. 4826 at 17.
[126] *First Five-Year Review*, USITC Pub. 4826 at 18.
[127] *First Five-Year Review*, USITC Pub. 4826 at 19-20.
[128] *First Five-Year Review*, USITC Pub. 4826 at 20.
[129] *First Five-Year Review*, USITC Pub. 4826 at 21.
[130] CR/PR at II-9.
[131] CR/PR at II-9.
[132] CR/PR at Figure II-3.
[133] CR/PR at II-9 & Figure II-2. Between 2018 and 2022, newly installed solar generation totaled approximately 45.1 GW, and newly installed wind approximately 54.9 GW. *Id*.

centers.[134] During the period of review, electricity generation was flat at around 4,000 million megawatt-hours per year.[135]

A majority or plurality of responding U.S. producers, importers, purchasers, and foreign producers reported that demand for LPTs in the U.S. market fluctuated upwards or did not change from January 1, 2018 to December 31, 2020.[136] Additionally, a majority or plurality of firms reported U.S. demand fluctuated up or steadily increased from January 1, 2021 to December 31, 2023.[137] In terms of anticipated demand, a majority of U.S. producers, importers, purchasers, and foreign producers reported that they anticipate that U.S. demand for LPTs would steadily increase.[138]

Apparent U.S. consumption of LPTs increased irregularly during the 2021-2023 period.[139] Specifically, apparent U.S. consumption increased from 148,271 MVA in 2021 to 177,627 MVA in 2022, before dipping to 175,750 MVA in 2023, a level that is 18.5 percent higher than in 2021.[140]

b) Supply Conditions

During the POR, the domestic industry remained the *** supplier of LPTs to the U.S. market, although it lost market share over the 2021-2023 period. The domestic industry's share of apparent U.S. consumption decreased from 32.5 percent in 2021 to 30.0 percent in 2022 and to 29.2 percent in 2023.[141] There have been several changes to the domestic industry

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[134] CR/PR at II-16; Domestic Producers' Prehearing Br. at 10; Respondents' Prehearing Br. at 1, 11.

[135] CR/PR at II-8, Table II-4, Figure II-1.

[136] CR/PR at Table II-7. From 2018 to 2020, four of nine responding U.S. producers reported that demand did not change and three reported that demand fluctuated up; six of 11 responding importers reported that demand fluctuated up and three reported no change in demand; eight of 15 responding purchasers reported that demand did not change while three reported it fluctuated up. *Id*.

[137] CR/PR at Table II-7. During the 2021-2023 period, four of nine responding U.S. producers reported that demand fluctuated up and three reported that demand steadily increased; eight of 12 responding importers reported that demand steadily increased and three reported that demand fluctuated up; 13 of 16 responding purchasers reported that demand steadily increased while three reported that it fluctuated up. *Id*.

[138] CR/PR at Table II-8.

[139] CR/PR at Table I-13.

[140] CR/PR at Tables I-13, C-1.

[141] CR/PR at Tables I-13, C-1.

since January 1, 2018, including expansions, acquisitions, a plant opening, and a plant closing.[142] As a result of these changes, the domestic industry's capacity increased from 58,870 MVA in 2021 to 61,758 MVA in 2022 and 66,174 MVA in 2023, a level 12.4 percent higher than in 2021.[143] The domestic industry's reported capacity utilization decreased from 84.5 percent in 2021 to 78.0 percent in 2022, and 77.7 percent in 2023.[144]

During the 2021-2023 period, subject imports accounted for the *** share of apparent U.S. consumption, although subject import market share increased irregularly. Subject imports' share of apparent U.S. consumption decreased from *** percent in 2021 to *** percent in 2022, before increasing to *** percent in 2023.[145]

Nonsubject imports were the *** source of supply to the U.S. market during the POR.[146] Nonsubject imports' share of apparent U.S. consumption increased from *** percent in 2021 to *** percent in 2022, and decreased to *** percent in 2023.[147] The largest sources of nonsubject imports in 2023 were Mexico, Netherlands, Brazil, Croatia, China, Poland, and Canada.[148]

A majority of responding U.S. producers and purchasers reported that they have experienced supply constraints over the current period of review, and a majority of importers reported not experiencing supply constraints.[149] U.S. producers and importers reported that they have limited production capacity and experienced supply chain disruptions during the POR.[150]

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[142] Notably, Mitsubishi Electric Power Products, Inc. sold its Memphis, TE manufacturing plant to HHIC in February 2020, and Hyosung HICO began operations at the plant in March 2020. Hitachi Energy USA ***. Capacity expansions were completed during the POR by ***, WEG Transformers, and ***. Siemens, HD HPT USA, WEG Transformers, Delta Star, Hitachi Energy USA, ***, ***, and *** have announced future expansions. Quanta Services Inc. acquired PA Transformer and Prolec-GE Waukesha acquired SPX Transformer Solutions in 2021. CR/PR at Tables III-1, III-2, III-3.

[143] CR/PR at Tables III-4, C-1.

[144] CR/PR at Tables III-4, C-1.

[145] CR/PR at Tables I-13, C-1.

[146] CR/PR at Tables I-13, C-1.

[147] CR/PR at Tables I-13, C-1.

[148] CR/PR at II-7.

[149] CR/PR at II-7. Six of nine U.S. producers, five of eleven importers, and 14 of 17 purchasers reported experiencing supply constraints since January 1, 2018. *Id.*

[150] CR/PR at II-7-8.

c) Substitutability and Other Conditions

In this review, we find that there is a moderate-to-high degree of substitutability between domestically produced LPTs and subject imports.[151] Although each LPT is built to order based on a purchaser's specifications, domestic producers and importers of LPTs from South Korea compete for sales to a purchaser by submitting bids for the production of LPTs built to the same specifications.[152] A majority of responding domestic producers and most responding purchasers reported that subject imports and domestically produced LPTs are always or frequently interchangeable, although responding importers' responses were mixed.[153] When asked to compare subject imports to domestically produced LPTs according to 25 factors relevant to their purchasing decisions, most responding purchasers reported that LPTs from the two sources are comparable with respect to 24 of the factors, including factors the responding purchasers found very important, such as delivery time (16 of 17 purchasers), reliability of supply (16 of 17), quality meets industry standards (15 of 17), and availability (14 of 16).[154] Similarly, most responding purchasers reported that subject imports and domestically produced LPTs are always or usually able to meet minimum quality specifications.[155] U.S. producers and U.S. importers both reported making a majority of their LPT shipments in the ***, but also reported LPT shipments in the *** size ranges.[156] Although U.S. producers *** during the 2021-2023 period, U.S. importers reported that ***.[157] *** domestic producers reported the ability to produce the full range of LPTs in terms of top-rated MVA.[158]

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[151] CR/PR at II-19-20.

[152] CR/PR at I-28, II-17, V-1.

[153] CR/PR at Tables II-15, II-17. Three responding importers reported that subject imports and domestically produced LPTs were always interchangeable, three reported they were never interchangeable, and two reported they were sometimes interchangeable. *Id*. at Table II-16.

[154] CR/PR at Table II-14. Four of eight responding purchasers reported that domestically produced LPTs were inferior to subject imports regarding the availability of products top rated at greater than 499 MVA, three reported they were comparable, and one reported they were superior. *Id*.

[155] CR/PR at Table II-12. Nine purchasers reported that they did not know whether subject producers were able to meet minimum quality specifications. *Id*.

[156] CR/PR at Tables F-1, F-2.

[157] CR/PR at Tables F-1, F-2, F-5.

[158] CR/PR at Table III-6. *** domestic producers reported the ability to produce, or actual production of, LPTs with a top rated range of 500 to 799 MVA, and *** domestic producers reported the ability to produce LPTs with a top rated range of 800 or greater MVA. *Id.*

We also find that price is an important factor in purchasing decisions, although non-price factors are also important.[159] When asked to rank the three most important factors influencing their purchasing decisions, more responding purchasers included price or cost (15 firms), lead time/delivery (12 firms), quality (9 firms), and project, design or technical specifications (5 firms) among their top three factors than any other factors.[160] Purchasers ranked quality as the first most important factor (5 firms), followed by price/cost (4 firms) and project, design, or technical (4 firms), and price/cost was mentioned more than any other factor as the second most important consideration.[161] Similarly, when asked to rate the importance of 25 factors to their LPT purchasing decisions, 12 responding purchasers rated price as very important.[162] Eight of 17 responding purchasers reported that they usually purchase the lowest-priced LPTs, seven reported that they sometimes did, and two reported never purchasing the lowest-priced LPTs.[163] When asked how often differences other than price were significant in choosing between LPTs from South Korea and the United States, most responding producers and purchasers reported sometimes or never, while responding importers' responses were mixed.[164] Non-price factors that were rated very important by most responding purchasers included delivery time, reliability of supply, quality meets industry standards, and availability.[165]

The importance of price to purchasers is also reflected in the fact that LPTs are purchased pursuant to a bidding process, in which purchasers generally consider the initial costs (including delivery and installation) and the evaluated/lifetime cost (the base price plus the ownership costs, including losses, over the expected life of a transformer).[166] When requesting quotes from competing suppliers, purchasers detail the precise specifications of the

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[159] As discussed further below in section III.C.2, price/cost was cited as a reason for awarding a bid in 10 of 11 bid events. CR/PR at Tables V-12, V-14, V-16, V-18, V-20, V-22, V-26, V-28, V-30, H-1.

[160] CR/PR at Table II-10.

[161] CR/PR at Table II-10.

[162] CR/PR at Table II-11.

[163] CR/PR at II-19.

[164] CR/PR at Tables II-18-20. Half of responding importers reported that differences other than price were sometimes or never significant and the other half reported that differences were frequently or always significant. *Id*. at Table II-19.

[165] CR/PR at Table II-11. Sixteen responding purchasers rated delivery time as a very important consideration in their LPT purchasing decisions. *Id.* Most responding purchasers (four of seven) reported that subject imports and domestically produced LPTs were comparable in terms of this factor. *Id.* at Table II-14.

[166] CR/PR at V-8, Table V-9. No purchasers indicated that they only consider the initial cost. *Id*.

required LPTs, including the desired physical characteristics, power ratings, line voltages, and other characteristics.[167] To assemble a formal bid, LPT suppliers must invest substantial time and money reviewing the specifications, designing the required LPT, and costing out the elements of the design.[168] In most cases, suppliers have only one opportunity to bid on a particular contract.[169]

Most purchasers require suppliers to become certified or qualified before they can bid on projects.[170] The length of time necessary to qualify a new supplier ranged from 45 to 180 days among responding purchasers.[171]

Seven of 17 responding purchasers reported purchasing at least some LPTs under long-term agreements, known variously as alliance agreements, blanket agreements, blanket contracts, master service agreements, or outline agreements.[172] Most U.S. producers (seven of nine firms) and half of responding importers (six of 12 firms) reported that they always or usually were required to enter into a blanket agreement as a condition to bid on a particular project.[173] Such agreements allow utilities to purchase LPTs of a similar design more rapidly and at lower cost while permitting suppliers to bid against a smaller number of competitors over the duration of an agreement.[174] Most long-term supply agreements reported by responding purchasers are not exclusive and therefore permit competition between suppliers for sales pursuant to the agreements.[175]

U.S. producers and importers reported that all of their shipments were produced to order. U.S. producers reported that lead times averaged three years in 2023, while U.S. importers' lead times averaged one-and-one-half years.[176]

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[167] Respondents' Posthearing Br., Exhibit 1 at 61; *First Five-Year Review*, USITC Pub. 4826 at 19; CR/PR at Tables V-11-30.

[168] CR/PR at II-1 n.2; Hearing Tr. at 141 (Jun Kang) ("Preparing quotes is time-consuming and expensive. . ."); *First Five-Year Review*, USITC Pub. 4826 at 19.

[169] CR/PR at V-12.

[170] CR/PR at II-20. Fourteen of 16 responding purchasers require suppliers to be certified or qualified. *Id*.

[171] CR/PR at II-20-21.

[172] CR/PR at V-4.

[173] CR/PR at V-4.

[174] CR/PR at II-2.

[175] CR/PR at II-2, V-4. Almost all of the reported blanket purchase agreements did not require the purchaser to buy from the supplier. CR/PR at V-4.

[176] CR/PR at II-20.

Purchasers use slot reservations to reserve production slots with U.S. producers and subject producers to ensure production capacity availability in the future.[177] U.S. producers and subject producers generally require a fee to reserve a production slot, although some producers allow slot reservations ***, while others require ***.[178] Fees are typically based on a sliding scale that increases as the design and production schedule progresses.[179] Domestic producers and subject producers are currently reserving production slots for 2025 and 2026.[180]

We also find that there is at least a limited degree of transparency with respect to competing bid prices and the identity of competitors in bidding events, although most responding purchasers reported that they do not quote competing prices during negotiations.[181] Most responding purchasers reported that they had attended post-bid meetings with suppliers that lost a bid and provided general feedback regarding whether the supplier was price-competitive, without revealing specific pricing.[182] Responding purchasers reported generalized discussions with unsuccessful bidders, conveying general pricing information to suppliers through pricing guidance at a high level, verbal feedback about pricing in the form of percentages, providing rankings of suppliers, and sharing bid tabs with suppliers to show where quotes were in relation to other quotes.[183] Based on such feedback, a supplier can gain some understanding of how much higher their losing bid price was above the winning bid.[184] Suppliers can also glean information on their competitors' pricing from the open bidding events held by public utilities, in which competitors and their bid prices are disclosed.[185]

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[177] CR/PR at II-5 n.7.

[178] Respondents' Prehearing Br. at 21.

[179] Domestic Producers' Prehearing Br. at 16; Respondents' Posthearing Br. Exhibit 1 at 20. Hearing Tr. at 21 (Wolken).

[180] Respondents' Prehearing Br. at Exhibit 1; Respondents' Posthearing Br. Exhibit 1 at 23, Exhibit 4; Domestic Producers' Posthearing Br. at 14 n.15.

[181] CR/PR at V-12. The domestic interested parties also claim that domestic producers can be discouraged from even bidding on a potential sale by the likelihood of losing the bid to low-priced subject imports. Noting the substantial amount of time and expense required to prepare a bid, the domestic interested parties claim that domestic producers may forgo bids when past experience suggests they are likely to lose to subject imports in order to conserve their limited resources for preparing such bids. Domestic Interested Parties' Prehearing Brief at 29.

[182] CR/PR at V-12.

[183] CR/PR at V-12-13 n.9; *** Purchaser Questionnaire at Question III-25(b).

[184] Hearing Tr. at 83 (Delello), 83-84 (Schweng).

[185] Hearing Tr. at 83-84 (Schweng), 82 (Wolken).

The major components and raw materials used to produce LPTs include windings, controls and accessories, and grain-oriented electrical steel ("GOES").[186] Other inputs include steel plate and dielectric mineral oil.[187] From 2018 to 2020, responding domestic producers reported mixed raw material price trends;[188] however, from 2021 to 2023, seven of nine responding U.S. producers reported that raw material prices either fluctuated upward or steadily increased.[189] Most responding U.S. producers anticipate that raw material prices will steadily increase or continue to fluctuate upward in the reasonably foreseeable future.[190] Most responding domestic producers reported that the imposition of tariffs on imports of steel products pursuant to section 232 has not had a substantial effect on their raw material prices.[191]

C. Likely Volume of Subject Imports

1. The Original Investigation and First Five-Year Review

In the original investigation, the Commission found the subject import volume and the increase in that volume to be significant, both in absolute terms and relative to production and consumption in the United States.[192] Subject import volume increased *** percent from 2009 to 2011, but was lower in interim 2012, at *** MVA, than in interim 2011, at *** MVA.[193] Subject import market share increased irregularly from *** percent in 2009 to *** percent in 2011, and was *** percent in interim 2012 compared to *** percent in interim 2011.[194] The ratio of subject imports to domestic production increased irregularly from *** percent in 2009 to *** percent in 2011, and was *** percent in interim 2012 compared to *** percent in interim 2011.[195]

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[186] CR/PR at V-1.

[187] CR/PR at V-1.

[188] CR/PR at V-1. From 2018 to 2020, six U.S. producers reported that prices have not changed, while two reported that they have steadily increased, and one that they had fluctuated upward. *Id*.

[189] CR/PR at V-1.

[190] CR/PR at V-1.

[191] CR/PR at V-1, Table V-1. Four of six responding domestic producers reported that the section 232 tariffs did not have a substantial effect on their raw material prices, while two reported they did have a substantial effect and three firms indicated they did not know. *Id*.

[192] *Original Determination*, USITC Pub. 4346 at 16.

[193] Confidential Views, *Large Power Transformers from Korea*, Inv. No. 731-TA-1189 (Final) ("*Confidential Original Determination*"), EDIS Doc. No. 620531, at 23-24.

[194] *Confidential Original Determination* at 24.

[195] *Confidential Original Determination* at 24.

The Commission recognized that the increase in subject imports coincided with rising apparent U.S. consumption and increasing domestic industry sales and shipments from 2009 to 2011.[196] As subject imports captured 1.5 percentage points of market share from the domestic industry, however, the industry's sales and shipments increased by considerably less than the increase in apparent U.S. consumption, though domestic producers had the capacity to supply the additional demand during the period.[197] Furthermore, the Commission found that subject imports increased their market penetration with respect to product types for which competition between subject import and domestic producers was most intense.[198]

In the first five-year review, the Commission found that revocation of the order would likely result in a significant increase in subject import volume within a reasonably foreseeable time.[199] The Commission observed that subject imports continued to maintain a significant and increasing presence in the U.S. market, despite the existence of the order, and that South Korean producers had significant capacity and unused capacity.[200] Moreover, it found that subject producers were export oriented and the United States was the South Korean industry's single most important export market for transformers in 2017.[201]

2. The Current Five-Year Review

Subject imports maintained a continuous and substantial presence in the U.S. market throughout the POR, although subject import volume and market share remained lower with the order in place than during the original period of investigation. The record indicates that shipments of subject imports decreased *** percent from 2021 to 2022, falling from *** MVA in 2021 to *** MVA in 2022, and dramatically increased *** percent from 2022 to 2023, rising from *** MVA to *** MVA.[202] Subject imports' share of apparent U.S. consumption increased irregularly, initially falling from *** percent in 2021 to *** percent in 2022, and rising to *** percent in 2023, a level *** percentage points higher than in 2021.[203] Given their substantial presence in the U.S. market, South Korean producers possess the market knowledge and

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[196] *Original Determination*, USITC Pub. 4346 at 17.

[197] *Original Determination*, USITC Pub. 4346 at 17. Subject imports also captured *** percentage points of market share from nonsubject imports. *Confidential Original Determination* at 24.

[198] *Original Determination*, USITC Pub. 4346 at 17.

[199] *First Five-Year Review*, USITC Pub. 4826 at 22.

[200] *First Five-Year Review*, USITC Pub. 4826 at 22-23.

[201] *First Five-Year Review*, USITC Pub. 4826 at 23-24.

[202] CR/PR at Table I-12.

[203] CR/PR at Table I-12.

customer contacts necessary to rapidly increase their sales after revocation.[204] Indeed, South Korean producers were either qualified to sell or sold LPTs to 10 of 17 responding purchasers.[205]

The LPT industry in South Korea grew over the POR. Iljin announced plans to expand its LPT plant and open a second LPT plant. HDHE opened a new "smart" LPT factory during the POR and expects its ***."[206] HHIC ***.[207] Subject producers also reported that their practical LPT capacity increased 7.8 percent from 2021 to 2023, initially falling from 84,306 MVA in 2021 to 77,998 MVA in 2022 and then increasing to 90,858 MVA in 2023.[208] Even as responding producers irregularly increased their practical LPT capacity utilization from 66.1 percent in 2021 to 88.7 percent in 2023, they maintained significant excess practical capacity ranging from 10,231 MVA in 2023 to 28,571 MVA in 2021.[209] These levels of available practical capacity account for a significant portion of apparent U.S. consumption in these years and support subject producers' ability to supply a greater share of the U.S. market.[210] All subject producers reported manufacturing other products on the same equipment used to produce subject LPTs, with substantial capacity potentially available to shift to LPT production.[211] In addition to U.S. shipments of subject imports increasing from *** MVA in 2022 to *** MVA in 2023, arranged subject imports in 2024 are anticipated to increase an additional *** percent to *** MVA in

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[204] *See*, *e.g.*, CR/PR at Table III-19 (***)

[205] Purchasers' Questionnaire Responses at Questions II-1 and III-28b.

[206] CR/PR at Tables IV-7-8; Joint Respondents' Posthearing Br. at 2-3. Subject producers reported that South Korean labor laws have limited the number of hours employees work ***. CR/PR at IV-13, Table IV-11. HDHE's smart facility uses robotic technology and other innovations to automate LPT production to produce more LPTs with fewer labor constraints. Domestic Producers' Posthearing Br., Exhibit 1 at 3.

[207] CR/PR at Table IV-9.

[208] CR/PR at Table IV-10. Subject producers reported that their practical overall capacity increased from 105,567 MVA in 2021 and 2022 to 109,167 MVA in 2023. *Id*. at Table IV-11.

[209] CR/PR at Table IV-10.

[210] In each respective year of the POR, subject producers' available practical LPT capacity amounted to *** percent of apparent U.S. consumption in 2021, *** percent of apparent U.S. consumption in 2022, and *** percent of apparent U.S. consumption in 2023. *Calculated from* CR/PR at Tables IV-10 and C-1. Additionally, subject producers reported even greater levels of available installed overall capacity, contingent on their ability to hire additional workers. Subject producers' reported levels of installed overall capacity were 124,920 MVA in 2021 and 2022, and 129,400 MVA in 2023; subject producers' available capacity using installed overall data was 50,980 MVA in 2021, 44, 090 MVA in 2022, and 31,057 MVA in 2023. CR/PR at Table IV-10.

[211] *See* CR/PR at Table IV-13.

2024.[212] Given subject producers' substantial excess capacity and their ability to product shift, we find that they have the ability to increase their exports of LPTs to the United States after revocation.

We also find that subject producers are export oriented. Export shipments constituted the majority of subject producers' total shipments of LPTs in each year of the 2021-2023 period, increasing from *** percent in 2021 to *** percent in 2023.[213] Responding subject producers reported that their export shipments increased from *** MVA in 2021 to *** MVA in 2023.[214] According to Global Trade Atlas ("GTA") data concerning transformers and parts, which includes LPTs and out-of-scope products, the subject industry was the second-largest global exporter of such merchandise in 2023.[215] These data also show that South Korea's exports of transformers and parts increased by 140.5 percent during the POR, from $284.2 million in 2021 to $683.4 million in 2023.[216]

The United States remains an attractive export market for subject producers, providing them with the incentive to export significant and increasing volumes of subject merchandise to the United States in the event of revocation. Subject imports maintained a substantial and increasing presence in the U.S. market throughout the 2021-2023 period, indicating that subject producers possess the infrastructure, customer relationships, and logistics to continue increasing their already significant exports to the United States in the event of revocation.[217] Subject producers reported that their second-largest export market was the United States in 2023.[218] Indeed, subject producers reported that exports of LPTs to the United States increased *** between 2022 and 2023 as their exports to other markets declined, demonstrating an ability to shift production from other markets to the United States.[219] Moreover, HDHE's

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[212] CR/PR at Table IV-4.

[213] CR/PR at Table IV-12.

[214] CR/PR at Table IV-12.

[215] CR/PR at Table IV-16.

[216] CR/PR at Table IV-16.

[217] CR/PR at Table IV-14.

[218] CR/PR at Table IV-14. Subject producers reported that *** was the top export market, although some producers included export destinations in the *** in the *** market, while others included them in ***. *Id*. at IV-17. Additionally, export data of LPTs reported by subject producers is consistent with official export statistics concerning transformers and parts, which includes LPTs and out-of-scope products and may thus be overstated. These data indicate exports to the United States were the subject industry's largest market in 2023. CR/PR at Table IV-15.

[219] CR/PR at Table IV-14. Between 2022 and 2023, subject producers' export of LPTs to other USMCA countries, European Union, and Asia markets declined, while those to the United States increased ***. *Id*.

production slot data indicate that it was able to increase the number of production slots for sales to the U.S. market in 2025 and 2026 by shifting production from other markets.[220]

Enhancing the attractiveness of the U.S. market to subject producers, the average unit values ("AUVs") of South Korean producers' exports to the United States were substantially higher than the AUVs of their shipments to home market customers in 2023.[221] Additionally, the AUVs of subject producers' exports to the USMCA countries, including the United States, were higher than the AUVs of their exports to other markets in 2023.[222] And, as noted above, responding importers reported significant and increasing quantities of arranged subject imports in 2024, reflecting the subject producers' continued interest in serving the U.S. market with significant volumes of LPTs.[223]

An antidumping duty order is in effect in Argentina for imports of three-phase liquid dielectric transformers with power greater than 10,00 kVA but not exceeding 500,000 kVA from South Korea. Additionally, an antidumping duty order is in effect in Canada for imports of liquid

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[220] Respondents' Prehearing Br. at Exhibit 3 (HDHE's Production slot data); CR/PR at Table IV-9.

[221] CR/PR at Tables IV-12, IV-14. We examine AUV data with caution as we recognize that it is calculated based on unit value rather than per MVA and there may be differences in product mix or changes in product mix over time.

[222] CR/PR at Table IV-14. Additionally, GTA export data and Korea Trade Statistics Promotion Institute (KTSPI) data for LPTs for transformers and parts, which includes LPTs and out-of-scope products, also support that the United States was one of the largest export markets for this broader category of goods. CR/PR at IV-19, Table IV-15.

[223] CR/PR at Table IV-4. We are unpersuaded by Respondents' claim that their investments in U.S. production plants will have restraining effects on likely volume and price effects in the event of revocation, especially given strong and growing demand. Respondents' Prehearing Br. at 21-22, 32-35; Respondents' Posthearing Br. Exhibit 1 at 64; Respondents' Final Comments at 11-13. There are two additional subject producers in South Korea that are not affiliated with U.S. producers and would have no deterrent from using low prices to gain sales in the U.S. market. In addition, even those subject producers with affiliated U.S. producers would not be deterred from using low prices to gain sales at the expense of each other's affiliated U.S. producers. During the current review period, subject producer *** often bid on the same projects as domestic producer ***, and also bid against ***, winning all of its bidding events by generally offering lower base price and evaluated costs. CR/PR at Tables V-12, V-14, V-16, V-18, V-20, V-22, H-1. Moreover, *** shifted their supply of LPT for the U.S. market from domestic production to subject imports between 2022 and 2023. Between these years, *** decreased its U.S. production from *** MVA in 2022 to *** MVA in 2023, while its affiliate's imports increased from *** MVA in 2022 to *** MVA in 2023. CR/PR at Table III-17. We find that this shift in supply by *** in the latter portion of the POR supports that its U.S. production facility would not restrain increases in subject import levels upon revocation of the order. Furthermore, representatives of *** and *** testified that ***. Hearing Tr. at 229 (Neal), 230 (Jung Kang); Respondents' Prehearing Br. at 28, Respondents' Posthearing Br., Exhibit 1 at 63. *** would have no disincentive from offering low prices in competitions for bids that the U.S. operations could not service.

dielectric transformers having a top power capacity equal to or exceeding 60,000 kVA from South Korea.[224] These barriers to entry would create additional incentives for subject producers to direct exports to the U.S. market if the order under review were revoked.[225]

Accordingly, based on the foregoing, including the significant and increasing volume of subject imports during the original investigation and first review, the substantial and increasing presence of subject imports in the U.S. market between 2021 and 2023, subject producers' substantial production capacity, excess capacity, global export orientation, ability to shift exports between markets, and the attractiveness of the U.S. market, we find that in the event of revocation of the order, the volume of subject imports would likely be significant both in absolute terms and relative to consumption.

D. Likely Price Effects

1. The Original Investigation and First Five-Year Review

In the original investigation, the Commission found that significant subject import underselling during the original period of investigation caused a shift in market share from the domestic industry to subject imports and significantly suppressed prices for the domestic like product.[226] The Commission began its analysis by reiterating that subject imports and domestically produced LPTs built to the same specifications were highly substitutable, and that price was an important factor in purchasing decisions.[227] The Commission then considered the extensive bidding data collected from U.S. purchasers in the investigation, including the base price and evaluated cost offered by each bidder and the reasons for accepting or rejecting each bid.[228] In considering these data, the Commission observed that purchasers cited lower overall cost as at least one reason for selecting the winning bidder in a plurality of bidding events, and that there was some transparency in the bidding process because bids submitted to public utilities were public and because purchasers may provide feedback to bidders.[229]

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[224] CR/PR at IV-20.

[225] Subject producers reported end-of-period inventories of *** MVA in 2021, *** MVA in 2022, and *** MVA in 2023. CR/PR at Table IV-12. LPTs in inventories consisted of finished units in transit. Respondents' Posthearing Br. at 24.

[226] *Original Determination*, USITC Pub. 4346 at 20.

[227] *Original Determination*, USITC Pub. 4346 at 18.

[228] *Original Determination*, USITC Pub. 4346 at 18.

[229] *Original Determination*, USITC Pub. 4346 at 18-19.

Based on bidding data, the Commission found subject import underselling to be significant.[230] Specifically, the Commission found that suppliers of subject imports won a substantial number of bids when the lowest bid or evaluated cost was the reason for their selection, with such suppliers underbidding domestic producers by 9.7 to 40.3 percent in terms of base price and 3.9 to 19.7 percent in terms of evaluated cost.[231] The Commission also found that individual suppliers of subject imports, including HHIC, Hyundai, and Iljin, underbid domestic producers in the vast majority of comparisons and in the vast majority of bidding events won by the suppliers, on both an initial price and evaluated cost basis.[232] As further evidence of underselling, the Commission observed that purchasers had confirmed Domestic Producers' lost sales allegations of $26.1 million, involving 128 units.[233]

The Commission also found that subject imports suppressed domestic like product prices, as the domestic industry's ratio of cost of goods sold to net sales increased steadily from *** percent in 2009 to *** percent in 2011 and *** percent in interim 2012, compared to *** percent in interim 2011.[234] The Commission attributed the industry's inability to increase prices sufficiently to cover its costs, despite growing demand, to the significant and increasing volume of subject imports offered at bids below those for the domestic like product.[235]

The Commission rejected respondents' argument that competition between subject imports and the domestic like product was limited for LPTs over 300 MVA with high line voltage ratings of 345 kV and above. As the Commission explained, domestic producers submitted bids for LPTs in that range, and bid against South Korean suppliers for sales of such LPTs in many instances.[236]

The Commission concluded that subject imports had significant adverse effects on prices for the domestic like product.

In the first five-year review, the Commission again found that there was a high degree of substitutability between subject imports and domestically produced LPTs that are built to the same specifications and that price was an important factor in purchasing decisions, although non-price factors were also important.[237] The Commission noted that through the bidding

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[230] *Original Determination*, USITC Pub. 4346 at 19.
[231] *Original Determination*, USITC Pub. 4346 at 19.
[232] *Original Determination*, USITC Pub. 4346 at 19.
[233] *Original Determination*, USITC Pub. 4346 at 20.
[234] *Confidential Original Determination* at 29.
[235] *Original Determination*, USITC Pub. 4346 at 20.
[236] *Original Determination*, USITC Pub. 4346 at 20.
[237] *First Five-Year Review*, USITC Pub. 4826 at 27.

process, suppliers gained an understanding of their competitors' pricing through informal feedback for investor-owned utility bidding events and through open bidding events held by public utilities.[238]

The Commission found that even with the order in place, bidding data showed that subject import underselling remained significant. For reported bids won by South Korean producers, South Korean producers underbid domestic producers on 10 of 11 occasions with respect to both base price and evaluated cost.[239] The Commission found that, absent the disciplining effect of the order, South Korean producers would likely lower their bid prices further and increase the proportion of bidding events won against domestic producers toward the higher level that prevailed during the original investigation.[240] This underselling would likely place additional pressure on domestic producers either to reduce their prices or forgo price increases that would have otherwise occurred to compete for sales, resulting in the significant depression or suppression of domestic like product prices.[241] The Commission therefore concluded that revocation of the order would likely lead to significant subject import underselling and significant price depression or suppression within a reasonably foreseeable time.[242]

2. The Current Five-Year Review

As discussed in section IV.B.2.c., the record indicates that there is a moderate-to-high degree of substitutability between subject imports and domestically produced LPTs that are built to the same specifications. The record also indicates that price is an important factor in purchasing decisions, although non-price factors are important as well.[243] While bidding events

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[238] *First Five-Year Review*, USITC Pub. 4826 at 27.
[239] *First Five-Year Review*, USITC Pub. 4826 at 27.
[240] *First Five-Year Review*, USITC Pub. 4826 at 28.
[241] *First Five-Year Review*, USITC Pub. 4826 at 28-29.
[242] *First Five-Year Review*, USITC Pub. 4826 at 29.
[243] Respondents argue that price is not the sole or determinative factor in sales. Respondents Prehearing Br. at 41-44, Respondents' Posthearing Br. at 9-10; Respondents' Final Comments at 13. However, "price does not need to be the most important factor to be a very important factor and potentially even a determining factor to a purchasing decision." *See OCTAL Inc. v. United States*, 539 F. Supp. 3d 1291, 1305 (Ct. Int'l Trade 2021)*; see also Acciai Speciali Terni, S.p.A. v. United States*, 19 CIT 1051, 1059, 1995 WL 476719 (1995). As discussed above in section III.B.2.c., the record evidence establishes that price is an important factor in sales of LPTs. U.S. purchasers have reported that price (or cost) was almost always a decisive factor for awarding the winning bid. CR/PR at Tables V-12, V-14, V-16, V-18, V-20, V-22, V-26, V-28, V-30, H-1.

held by investor-owned utilities are closed, LPT suppliers gain a general understanding of their competitors' pricing through informal feedback from such utilities, as well as through the open bidding events held by public utilities.[244]

The Commission requested U.S. purchasers to provide bid data for their five largest purchases of LPTs since January 1, 2021 that involved at least one bid from a domestic producer and one bid from a South Korean firm.[245] For each bidding event, purchasers were requested to report the bid end date, the base MVA, the top MVA, the load loss evaluation ($ per kW), the number of units, the high line kV, the no load loss evaluation ($ per kW), the winning bidder, and the reason for the winning bidder.[246] Purchasers were also requested to report information received on bidders for each event, including the supplier name, the country, the base price, the evaluated cost, and the reasons for accepting or rejecting the bid.[247] Three purchasers provided useable bid data for eight bidding events.[248]

Even with the order in place, bidding data show that subject import underselling remained significant during the POR. For the reported bidding events, South Korean producers won all eight bid events and underbid domestic producers on seven of the eight occasions (87.5 percent of the time) with respect to base price, at an average margin of 13.6 percent, and on five of six occasions (83.3 percent of the time) with respect to evaluated cost, at an average margin of 13.7 percent.[249]

Consistent with our finding that subject import volume is likely to increase significantly after revocation, we find that subject import underselling is likely to intensify after revocation as a means for South Korean producers to increase their penetration of the U.S. market. The moderate-to-high degree of substitutability between subject imports and the domestic like

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[244] CR/PR at V-12-13.

[245] CR/PR at V-13.

[246] CR/PR at Table V-5.

[247] CR/PR at Tables V-11-30

[248] CR/PR at V-13 & n.10, Table H-1. Purchaser *** submitted three additional bid events but reported that within those three bid events no bid was submitted by a domestic producer or subject producer for the bidding events. CR/PR at at Tables V-23, V-26, V-27.

[249] CR/PR at Tables V-11-22, 29-30, H-1. For two bidding events, purchaser *** reported the base price but not the evaluated cost. *Id*. at Tables V-22, V-30. Respondents argue that the bid data do not support that subject import underselling would be significant upon revocation because *** of U.S. producers in these bid data that were underbid by subject imports were ***. Joint Respondents' Prehearing Br. at 48-49. However, the Commission considers the domestic industry as a whole, which in this case the Commission has defined as all domestic producers of LPTs. Indeed, that *** contradicts respondents' argument that subject producers' investments in U.S. production would have a restraining effect on subject imports upon revocation. *See*, *e.g.*, Joint Respondents' Prehearing Br. at 35.

product and the importance of price in purchasing decisions make underselling an effective strategy for winning bidding events. During the original investigation, the Commission found that significant subject import underselling allowed subject imports to increase their market share at the expense of the domestic industry.[250] In the first review, subject producers undersold the domestic like product in nearly all of the bidding events they won in competition with domestic producers, and increased their share of apparent U.S. consumption at the domestic industry's expense.[251] In the current review, subject producers undersold the domestic like product in nearly all of the bidding events they won against competition from domestic producers, during a time when subject imports increased their share of apparent U.S. consumption by *** percent at the expense of the domestic industry.[252] Absent the disciplining effect of the order, South Korean producers would likely lower their bid prices further and increase the volume of bidding events won against domestic producers toward the higher level that prevailed during the original investigation.[253]

We also find that the significant increase in low-priced subject import volume that is likely after revocation would suppress domestic like product prices to a significant degree. In the original investigation, the Commission found that significant subject import underselling suppressed domestic like product prices to a significant degree.[254] During the first review, the Commission found that the intensification of subject import underselling that would likely occur upon revocation would likely result in the significant depression or suppression of domestic like product prices.[255] During the current review, while subject import underselling remained significant, the unit value of the domestic industry's net sales increased from $*** per MVA in 2021 to $*** MVA in 2022 and $*** MVA in 2023.[256] At the same time, the industry's cost of goods sold ("COGS") increased, but its net sales increased more rapidly, resulting in its COGS to

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[250] *Original Determination*, USITC Pub. 4346 at 20.

[251] *First Five-Year Review*, USITC Pub. 4826 at 28.

[252] CR/PR at Table I-13.

[253] South Korean producers won *** percent of the reported bidding events in which domestic producers participated in the original investigation (*** of ***). South Korean producers won 26.2 percent of the reported bidding events in which domestic producers participated during the first review (11 of 42), and 87.5 percent of the reported bidding events in which domestic producers participated in this review (seven of eight). Confidential Staff Report, *LPTs from Korea*, Inv. No. 731-TA-1189 (Final), EDIS Doc. No. 806885, at Table V-5; Confidential Staff Report, *LPTs from Korea*, Inv. No. 731-TA-1189 (Review), EDIS Doc. No. 820865, at Table V-6; CR/PR at Tables V-11-30, H-1.

[254] *Original Determination*, USITC Pub. 4346 at 20.

[255] *First Five-Year Review*, USITC Pub. 4826 at 28-29.

[256] CR/PR at Table III-21.

net sales ratio decreasing from *** percent in 2021 to *** percent in 2022 and *** percent in 2023.[257] The intensification of subject import underselling that we have found likely after revocation would place pressure on domestic producers to either lower prices or forgo price increases that would have otherwise occurred, resulting in the inability to increase prices sufficiently to cover its costs.[258] Consequently, we find that revocation of the order would be likely to lead to significant subject import underselling and significant price depression and suppression within a reasonably foreseeable time.

E. Likely Impact[259]

1. The Original Investigation and First Five-Year Review

The Commission found that, by many measures, the domestic industry's performance improved during the original period of investigation, including capacity, production, shipments, net sales quantity, production related workers, hours worked, and wages paid, as apparent U.S. consumption increased.[260] The industry's market share and rate of capacity utilization declined, however, and its financial indicators deteriorated.[261] After posting healthy operating income in 2009, the industry suffered increasing operating losses that peaked in 2011, when subject

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[257] CR/PR at Table III-21. The industry's COGS increased from *** per MVA in 2021, *** per MVA in 2022, and *** MVA in 2023. *Id*.

[258] Respondents argue that the inverse relationship between the decreasing cash deposit rates and the increasing prices in the U.S. market suggests there is not a relationship between the order and the increasing prices in the U.S. market. Respondents' Prehearing Br. at 53-55; Respondents' Posthearing Br. at 12. While the statute gives the Commission discretion to consider the "likely" dumping margins to occur upon revocation, which Commerce determined was a weighted average margin of up to 29.04 percent in this review, it does not refer to antidumping margins that Commerce calculates in administrative reviews. 19 U.S.C. §§ 1675a(a)(6), 1675a(c)(3); *see also Large Power Transformers From the Republic of Korea: Final Results of the Expedited Second Sunset Review of the Antidumping Duty Order*, 89 Fed. Reg. 330 (Jan. 3, 2024). Indeed, the Commission has recognized that the existence of an order itself may impact the behavior of foreign producers and exporters as they seek to minimize duty rates. *See, e.g., Softwood Lumber from Canada*, Inv. Nos. 701-TA-566 and 731-TA-1342 (Review), USITC Pub. 5479 (Dec. 2023) at 33-34. Thus, increasing U.S. prices for subject imports may be consistent with the existence of the order, and trends in cash deposit rates are not necessarily indicative of likely import pricing upon revocation of the order.

[259] In its expedited second sunset review of the antidumping duty order, Commerce determined likely margins of up to 29.04 percent on subject imports from South Korea. *Large Power Transformers From the Republic of Korea: Final Results of the Expedited Second Sunset Review of the Antidumping Duty Order*, 89 Fed. Reg. 330 (Jan. 3, 2024).

[260] *Original Determination*, USITC Pub. 4346 at 21-22.

[261] *Original Determination*, USITC Pub. 4346 at 21-22.

import volume also peaked, and declining returns on investment and capital expenditures.[262] Based on the domestic industry's loss of market share to subject imports, which significantly underbid and suppressed domestic like product prices, the Commission found a causal nexus between subject imports and the industry's condition.[263] Nonsubject imports did not explain the domestic industry's declining performance, the Commission explained, because nonsubject import market share was highest in 2009, when the industry was profitable, and because subject imports won more bids on the basis of lower prices than nonsubject imports.[264] Therefore, the Commission concluded that the domestic industry was materially injured by subject imports.[265]

In the first five-year review, the Commission found the industry to be vulnerable to the recurrence or continuation of material injury upon revocation of the order.[266] Specifically, the Commission found that the domestic industry's performance deteriorated, and its financial losses grew toward the end of the review period.[267]

The Commission was unpersuaded by Respondents' argument that subject imports could have no adverse impact on the domestic industry after revocation because there allegedly was no correlation between subject import volume and the domestic industry's declining performance during the period of review.[268] The Commission explained that it is not required to show a causal nexus between subject import volume and the domestic industry's declining performance during the period of review. It further observed that there was in fact a correlation between the volume of subject imports and the domestic industry's performance during the review period.[269] The Commission was also unpersuaded by Respondents' argument that certain non-price factors contributed to the domestic industry's lagging performance during the period of review.[270] The Commission explained that the record did not support Respondents' argument that subject imports enjoyed a significant advantage over domestically produced LPTs in terms of non-price factors.[271]

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[262] *Original Determination*, USITC Pub. 4346 at 22.
[263] *Original Determination*, USITC Pub. 4346 at 22.
[264] *Original Determination*, USITC Pub. 4346 at 22-23.
[265] *Original Determination*, USITC Pub. 4346 at 23.
[266] *First Five-Year Review*, USITC Pub. 4826 at 32.
[267] *First Five-Year Review*, USITC Pub. 4826 at 32.
[268] *First Five-Year Review*, USITC Pub. 4826 at 33 n.242.
[269] *First Five-Year Review*, USITC Pub. 4826 at 33 n.242.
[270] *First Five-Year Review*, USITC Pub. 4826 at 33-34 n.243.
[271] *First Five-Year Review*, USITC Pub. 4826 at 33-34 n.243.

In its non-attribution analysis, the Commission found that although nonsubject imports were substantial during the review period, if the order were revoked, subject imports would likely have significant adverse effects on the domestic industry distinct from any adverse effects of nonsubject imports.[272] The Commission was unpersuaded by Respondents' argument that any increase in subject import volume after revocation would likely come at the expense of nonsubject imports given that the domestic industry gained most of the market share lost by subject imports after imposition of the order, and Hyundai admitted that revocation would cause market share shifts to "reverse."[273]

2. The Current Five-Year Review[274]

The domestic industry's performance indicators were mixed during the POR. The industry's practical LPT production capacity increased 12.4 percent from 2021 to 2023, while its production increased irregularly by 3.4 percent over the same period.[275] The decrease in production caused the domestic industry's capacity utilization rate to decline by 6.8 percentage points from 2021 to 2023, from 84.5 percent in 2021 to 78.0 percent in 2022 and 77.7 percent in 2023.[276]

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[272] *First Five-Year Review*, USITC Pub. 4826 at 34.

[273] *First Five-Year Review*, USITC Pub. 4826 at 34-35 n. 248.

[274] Domestic Producers suggest that the Commission should treat the reasonably foreseeable future in this review as the 2024 to 2029 period. Domestic Producers' Prehearing Br. at 35; Domestic Producers' Posthearing Br. at 3. The SAA states that a "'reasonably foreseeable time' will vary from case-to-case, but normally will exceed the 'imminent' timeframe applicable in a threat of injury analysis." SAA, H.R. Rep. No. 103- 316, vol. I, at 887 (1994). We see no need to define a particular number of years as the "reasonably foreseeable time" in this review. We note that all producers book orders well in advance of production and allow purchasers to reserve production slots to fill those orders, and that all of the domestic industry's currently available slots in 2024 and 2025 are filled. However, based on the record of this review, several domestic producers are expanding their production facilities, which will increase their LPT capacity in 2024 and over the next few years. As that capacity comes on-line in 2024 and subsequent years, domestic producers will continue to compete with subject imports for sales to fill the new capacity, and we have taken these likely developments into account in our analysis.

[275] CR/PR at Table III-4. The industry's LPT production decreased from 49,724 MVA in 2021 to 48,178 MVA in 2022, and increased to 51,398 MVA in 2023. The domestic industry's practical LPT production capacity increased from 58,870 MVA in 2021 to 61,758 MVA in 2022 and 66,174 MVA in 2023. *Id*.

[276] CR/PR at Table III-4.

The domestic industry's employment-related indicators generally improved. The number of production related workers ("PRWs"), total hours worked, and wages paid increased between 2021 and 2023.[277] Productivity decreased from 2021 to 2023.[278]

The domestic industry's U.S. shipments increased by 6.4 percent between 2021 and 2023.[279] The industry's share of apparent U.S. consumption decreased from 32.5 percent in 2021 to 30.0 percent in 2022 and 29.2 percent in 2023, a level 3.3 percentage points lower than in 2021.[280]

The domestic industry's financial performance indicia generally improved overall during the POR. The industry's net sales revenues, gross profits, operating income, and net income all increased from 2021 to 2023.[281] The domestic industry's operating and net income margins increased irregularly from 2021 to 2023.[282] The industry's total net assets and return on assets consistently increased from 2021 to 2023.[283] Its capital expenditures and research and development also consistently increased from 2021 to 2023.[284]

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[277] CR/PR at Table III-20. The number of PRWs increased from 1,232 in 2021 to 1,397 in 2022 and 1,686 in 2023. *Id.* Total hours worked increased from 2.6 million in 2021 to 3.0 million in 2022 and 3.5 million in 2023. *Id.* Wages paid increased from $74.2 million in 2021 to $93.2 million in 2022 and $118.2 million in 2023. *Id.*

[278] CR/PR at Table III-20. Productivity decreased from 19.2 MVA top rated per 1,000 hours in 2021 to 16.3 in 2022 and 14.5 in 2023. *Id.*

[279] CR/PR at Tables III-13. The domestic industry's U.S. shipments increased from 48,191 MVA in 2021 to 53,367 MVA in 2022 and decreased to 51,267 MVA in 2023. *Id.*

[280] CR/PR at Tables I-13, C-1. As discussed above, LPTs in inventory consist of finished units in transit. The domestic industry's ending inventory quantities decreased irregularly, decreasing from *** MVA in 2021 to *** MVA in 2022, before increasing to *** in 2023. *Id*. at Table III-16, C-1.

[281] CR/PR at Tables III-21, C-1. The domestic industry's net sales revenues increased from $*** in 2021 to $*** in 2022 and $*** 2023. Its gross profits increased from $*** in 2021 to $*** in 2022 and $*** in 2023. *Id.* Its operating income increased from *** in 2021 to *** in 2022 and $*** in 2023. *Id.* Its net income increased from *** in 2021 to *** in 2022 and $*** in 2023. *Id.*

[282] CR/PR at Table III-21. The domestic industry's operating income margin increased from *** percent in 2021 to *** percent in 2022, and *** percent in 2023. *Id.* The industry's net income margin increased from *** percent in 2021 to *** percent in 2022 and *** percent in 2023. *Id.*

[283] CR/PR at Tables III-27, III-28. The domestic industry's total net assets increased from $548.7 million in 2021 to $707.9 million in 2022 and $1.0 billion in 2023. *Id.* at Table III-27. The industry's return on assets increased from *** percent in 2021 to *** percent in 2022 and *** percent in 2023. *Id.* at Table III-28.

[284] CR/PR at Tables III-23, C-1. The domestic industry's capital expenditures increased from $20.6 million in 2021 to $27.4 million in 2022 and $32.6 million in 2023. *Id*. The industry's research and development expenses increased from $3.3 million in 2021 to $4.2 million in 2022 and $6.1 million in 2023. *Id.* at III-25.

As discussed above, we have found that if the order were revoked, the volume of subject imports would likely be significant within a reasonably foreseeable time. In order to increase their penetration of the U.S. market, South Korean producers would likely intensify the already significant level of subject import underselling that prevailed during the period of review, unrestrained by the disciplining effect of the order. Given that subject imports took *** percentage points of market share at the expense of the domestic industry with the order in place, the significant increase in low-priced subject imports that we find likely after revocation would likely capture further market share from the domestic industry, as they did in the original investigation.[285] It would also be likely to force domestic producers to reduce their prices or forgo price increases to compete for sales, thereby depressing or suppressing domestic like product prices to a significant degree. The likely significant volume of subject imports, coupled with their significant price effects, would likely have a significant adverse impact on the domestic industry's production, shipments, profitability, and employment, as well as its ability to raise capital and make and maintain necessary capital investments. Accordingly, we find that if the order were revoked, subject imports would likely have a significant adverse impact on the domestic industry within a reasonably foreseeable time.

We have considered whether there are other factors that likely would affect the domestic industry in the reasonably foreseeable future after revocation. We find that nonsubject imports are unlikely to prevent subject import volume from increasing significantly after revocation. Substantial nonsubject import volume during the original period of investigation and the first review did not prevent subject import volume from increasing significantly at the domestic industry's expense over both periods.[286] In the current review, nonsubject imports ranged from *** to *** percent of apparent U.S. consumption and did not prevent subject imports from increasing their market share at the domestic industry's expense.[287] Moreover, nonsubject import bid prices were generally higher than subject import bid prices during the period of review in terms of both base price and evaluated cost.[288]

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[285] CR/PR at Tables I-13, C-1.

[286] CR/PR at Appendix C.

[287] CR/PR at Tables I-13, C-1.

[288] CR/PR at Tables V-12, V-14, V-16, V-18, V-22. Of the five bid events with subject and nonsubject producers, nonsubject producer base prices were higher than subject producers in four of five bidding events and their evaluated cost were higher in three of four events. In one of the bidding events where the nonsubject producer's base price and evaluated costs were lower than the subject producer, the purchaser indicated that the nonsubject producers' actual costs were projected to be higher than subject producer's bid. *Id*. at Table V-18.

Competition between subject imports and the domestic industry would likely remain intense after revocation, irrespective of competition from nonsubject imports. Given the domestic industry's market share of 29.2 percent in 2023, the moderate-to-high degree of substitutability between the subject merchandise and the domestic like product, and the importance of price in purchasing decisions, the likely significant volume of low-priced subject imports would likely take market share, at least in part, from the domestic industry or force the domestic industry to decrease prices or forgo price increases that otherwise would occur to retain sales and market share. We find that the presence of nonsubject imports would not preclude subject imports from capturing market share from the domestic industry or suppressing prices for the domestic like product. We therefore find that subject imports would likely cause adverse effects on the domestic industry that are distinct from any effects attributable to nonsubject imports in the event of revocation.

In sum, we conclude that if the order were revoked, subject imports from South Korea would likely have a significant impact on the domestic industry within a reasonably foreseeable time.

IV. Conclusion

For the above reasons, we determine that revocation of the antidumping duty order on LPTs from South Korea would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.

Part I: Introduction

Background

On September 1, 2023, the U.S. International Trade Commission ("Commission" or "USITC") gave notice, pursuant to section 751(c) of the Tariff Act of 1930, as amended ("the Act"),[1] that it had instituted a review to determine whether revocation of the antidumping duty order on large power transformers ("LPTs") from South Korea would likely lead to the continuation or recurrence of material injury to a domestic industry.[2] [3] On December 5, 2023, the Commission determined that it would conduct full reviews pursuant to section 751(c)(5) of the Act. [4] Table I-1 presents information relating to the background and schedule of this proceeding.[5]

[1] 19 U.S.C. 1675(c).

[2] 88 FR 60496, September 1, 2023. All interested parties were requested to respond to this notice by submitting the information requested by the Commission.

[3] In accordance with section 751(c) of the Act, the U.S. Department of Commerce ("Commerce") published a notice of initiation of five-year reviews of the subject antidumping duty order. 88 FR 60438, September 1, 2023.

[4] 88 FR 87457, December 18, 2023. Because the Commission determined that both the domestic interested party group response and the respondent interested party group response were adequate, it determined to conduct a full review.

[5] The Commission's notice of institution, notice to conduct full reviews and scheduling notice are referenced in appendix A and may also be found at the Commission's web site (internet address *www.usitc.gov*). Commissioners' votes on whether to conduct an expedited or a full review may also be found at the web site. Appendix B presents the witnesses who appeared at the Commission's hearing.

Table I-1
LPTs: Information relating to the background and schedule of this proceeding

Effective date	Action
August 31, 2012	Commerce's antidumping duty order on LPTs from South Korea (77 FR 53177, August 31, 2012)
October 16, 2018	Commerce's continuation of the antidumping duty order on LPTs from South Korea (83 FR 52206, October 16, 2018)
September 1, 2023	Commission's institution of five-year review (88 FR 60496, September 1, 2023)
September 1, 2023	Commerce's initiation of five-year review (88 FR 60438, September 1, 2023)
December 5, 2023	Commission's determination to conduct a full five-year review (88 FR 87457, December 18, 2023)
January 3, 2024	Commerce's final results of expedited five-year review of the antidumping duty order (89 FR 330, January 3, 2024)
February 12, 2024	Commission's scheduling of the review (89 FR 12379, February 16, 2024)
June 20, 2024	Commission's hearing
August 2, 2024	Commission's vote
August 22, 2024	Commission's determination and views

The original investigation

The original investigation resulted from petitions filed by ABB Inc., Cary, North Carolina; Delta Star Inc., Lynchburg, Virginia; and Pennsylvania Transformer Technology Inc., Canonsburg, Pennsylvania, on June 14, 2011, alleging that an industry in the United States is materially injured and threatened with material injury by reason of less-than-fair-value ("LTFV") imports of LPTs from South Korea.[6] Following notification of a final determination by Commerce that imports of LPTs from South Korea were being sold at LTFV, the Commission determined on August 24, 2012 that a domestic industry was materially injured by reason of LTFV imports of LPTs from South Korea.[7] Commerce published the antidumping duty order on LPTs from South Korea on August 31, 2012.[8]

[6] Large Power Transformers from Korea, Inv. No. 731-TA-1189 (Final), USITC Publication 4346, August 2012 ("Original publication"), p. I-1.

[7] 77 FR 52758, August 30, 2012.

[8] 77 FR 53177, August 31, 2012.

First five-year review

In September 2018, the Commission completed a full five-year review of the subject order and determined that revocation of the antidumping duty order on LPTs from South Korea would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.[9] Following affirmative determinations in the first five-year reviews by Commerce and the Commission,[10] Commerce issued a continuation of the antidumping duty order on imports of LPTs from South Korea, effective October 16, 2018.[11]

Previous and related investigations

On June 14, 1972, the U.S. Department of Treasury issued antidumping duty findings on LPTs from France, Italy, and Japan.[12] These findings were revoked by Commerce effective January 1, 2000.[13]

Summary data

Table I-2 presents a summary of data from the original investigations, prior reviews, and the current full five-year reviews.

[9] 83 FR 49575, October 2, 2018.

[10] 82 FR 51604, November 7, 2017; 83 FR 49575, October 2, 2018.

[11] 83 FR 52206, October 16, 2018.

[12] 37 FR 11772, June 14, 1972. The scope of the 1972 findings included "all transformers rated 10 MVA or above, by whatever name designated, used in the generation, transmission, distribution, and utilization of electrical power, including but not limited to shunt reactors, autotransformers, rectifier transformers, and power rectifier transformers." Large Power Transformers from France, Italy, Japan, Switzerland, and the United Kingdom, United States Tariff Commission Publication 476, April 1972.

[13] Final Results of Sunset Review and Revocation of Antidumping Findings: Large Power Transformers from Italy, et al., 63 FR 54441, January 1, 2000.

Table I-2
LPTs: Comparative data from the original investigation and subsequent reviews, by terminal years 2011, 2017 and 2023

Quantity in MVA top rated; value in 1,000 dollars; unit values in dollars per MVA top rated; shares in percent.

Item	Measure	2011	2017	2023
Apparent consumption	Quantity	137,243	161,880	175,750
U.S. producers market share	Share of quantity	16.1	***	29.2
South Korea market share	Share of quantity	***	***	***
Nonsubject market share	Share of quantity	***	***	***
Imports market share	Share of quantity	83.9	***	70.8
South Korea	Quantity	***	***	***
South Korea	Value	***	***	***
South Korea	Unit value	***	***	***
Nonsubject sources	Quantity	***	***	***
Nonsubject sources	Value	***	***	***
Nonsubject sources	Unit value	***	***	***
All import sources	Quantity	115,177	***	124,483
All import sources	Value	845,310	***	1,338,763
All import sources	Unit value	7,339	***	10,755

Table continued.

Table I-2 Continued
LPTs: Comparative data from the original investigation and subsequent reviews, by terminal years 2011, 2017 and 2023

Quantity in MVA top rated; value in 1,000 dollars; unit values in dollars per MVA top rated; shares in percent.

Item	Measure	2011	2017	2023
Capacity	Quantity	59,439	***	66,174
Production	Quantity	24,049	***	51,398
Capacity utilization	Ratio	40.5	***	77.7
Producer U.S. shipments	Quantity	20,066	***	51,267
Producer U.S. shipments	Value	207,349	***	743,475
Producer U.S. shipments	Unit value	9,397	***	14,502
Production workers (number)	Noted in label	***	***	1,686
Hours worked (in 1,000 hours)	Noted in label	***	***	3,542
Wages paid (1,000 dollars)	Value	***	***	118,217
Hourly wages (dollars per hour)	Noted in label	***	***	33.38
Productivity (MVA top rated per 1,000 hours)	Noted in label	***	***	14.5
Net sales	Quantity	***	***	***
Net sales	Value	***	***	***
Net sales	Unit value	***	***	***
Cost of goods sold	Value	***	***	***
Gross profit or (loss)	Value	***	***	***
SG&A expense	Value	***	***	***
Operating income or (loss)	Value	***	***	***
Unit COGS	Unit value	***	***	***
Unit operating income	Unit value	***	***	***
COGS/ Sales	Ratio	***	***	***
Operating income or (loss)/ Sales	Ratio	***	***	***

Source: Office of Investigations memorandum INV-KK-082 (July 30, 2012), memorandum INV-QQ-099 (August 28, 2018), and compiled from data submitted in response to Commission questionnaires.

Note.--In the original investigation, value data for apparent U.S. consumption were not reported, as volume expressed in MVA (rather than value) was deemed to be the most reasonable basis for measuring apparent U.S. consumption and market share. Original publication, p. I-3, n.6.

Note: Apparent U.S. consumption is derived from U.S. shipments of imports for 2017 and 2023, rather than U.S. imports.

Table I-3 presents U.S. consumption and figure I-1 presents U.S. producers' U.S. shipments and U.S. imports from 2018 to 2023.

Table I-3
LPTs: U.S. producers' U.S. shipments, U.S. imports, and market shares based on quantity, by source, 2018-23

Quantity in MVA top rated; Shares in percent

Source	Measure	2018	2019	2020	2021	2022	2023
U.S. producers	Quantity	35,796	40,474	42,537	48,191	53,367	51,267
South Korea	Quantity	***	***	***	***	***	***
Nonsubject sources	Quantity	***	***	***	***	***	***
All import sources	Quantity	66,186	119,273	114,154	100,080	124,260	124,483
All sources	Quantity	101,982	159,747	156,691	148,271	177,627	175,750
U.S. producers	Share	35.1	25.3	27.1	32.5	30.0	29.2
South Korea	Share	***	***	***	***	***	***
Nonsubject sources	Share	***	***	***	***	***	***
All import sources	Share	64.9	74.7	72.9	67.5	70.0	70.8
All sources	Share	100.0	100.0	100.0	100.0	100.0	100.0

Source: Compiled from data submitted in response to Commission questionnaires. U.S. import data presented for 2018-20 are based on U.S. imports, and U.S. import data presented for 2021-23 are based on U.S. importers' U.S. shipments.

Figure I-1
LPTs: U.S. producers' U.S. shipments and U.S. imports, based on quantity, by source, 2018-23

* * * * * * *

Source: Compiled from data submitted in response to Commission questionnaires. U.S. import data presented for 2018-20 are based on U.S. imports, and for 2021-23 are based on U.S. importers' U.S. shipments.

Statutory criteria

Section 751(c) of the Act requires Commerce and the Commission to conduct a review no later than five years after the issuance of an antidumping or countervailing duty order or the suspension of an investigation to determine whether revocation of the order or termination of the suspended investigation "would be likely to lead to continuation or recurrence of dumping or a countervailable subsidy (as the case may be) and of material injury."

Section 752(a) of the Act provides that in making its determination of likelihood of continuation or recurrence of material injury--

> *(1) IN GENERAL.-- . . . the Commission shall determine whether revocation of an order, or termination of a suspended investigation, would be likely to lead to continuation or recurrence of material injury within a reasonably foreseeable time. The Commission shall consider the likely volume, price effect, and impact of imports of the subject merchandise on the industry if the order is revoked or the suspended investigation is terminated. The Commission shall take into account--*
>
> *(A) its prior injury determinations, including the volume, price effect, and impact of imports of the subject merchandise on the industry before the order was issued or the suspension agreement was accepted,*
>
> *(B) whether any improvement in the state of the industry is related to the order or the suspension agreement,*
>
> *(C) whether the industry is vulnerable to material injury if the order is revoked or the suspension agreement is terminated, and*
>
> *(D) in an antidumping proceeding . . ., (Commerce's findings) regarding duty absorption . . ..*
>
> *(2) VOLUME.--In evaluating the likely volume of imports of the subject merchandise if the order is revoked or the suspended investigation is terminated, the Commission shall consider whether the likely volume of imports of the subject merchandise would be significant if the order is revoked or the suspended investigation is terminated, either in absolute terms or relative to production or consumption in the United States. In so doing, the Commission shall consider all relevant economic factors, including--*

(A) any likely increase in production capacity or existing unused production capacity in the exporting country,

(B) existing inventories of the subject merchandise, or likely increases in inventories,

(C) the existence of barriers to the importation of such merchandise into countries other than the United States, and

(D) 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.

(3) PRICE.--In evaluating the likely price effects of imports of the subject merchandise if the order is revoked or the suspended investigation is terminated, the Commission shall consider whether--

(A) there is likely to be significant price underselling by imports of the subject merchandise as compared to domestic like products, and

(B) imports of the subject merchandise are likely to enter the United States at prices that otherwise would have a significant depressing or suppressing effect on the price of domestic like products.

(4) IMPACT ON THE INDUSTRY.--In evaluating the likely impact of imports of the subject merchandise on the industry if the order is revoked or the suspended investigation is terminated, the Commission shall consider all relevant economic factors which are likely to have a bearing on the state of the industry in the United States, including, but not limited to–

(A) likely declines in output, sales, market share, profits, productivity, return on investments, and utilization of capacity,

(B) likely negative effects on cash flow, inventories, employment, wages, growth, ability to raise capital, and investment, and

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

The Commission shall evaluate all such relevant economic factors . . . within the context of the business cycle and the conditions of competition that are distinctive to the affected industry.

Section 752(a)(6) of the Act states further that in making its determination, "the Commission may consider the magnitude of the margin of dumping or the magnitude of the net countervailable subsidy. If a countervailable subsidy is involved, the Commission shall consider information regarding the nature of the countervailable subsidy and whether the subsidy is a subsidy described in Article 3 or 6.1 of the Subsidies Agreement."

Organization of report

Information obtained during the course of the review that relates to the statutory criteria is presented throughout this report. A summary of trade and financial data for LPTs as collected in the original investigation, prior review, and the current full five-year review is presented in appendix C. U.S. industry data are based on the questionnaire responses of ten U.S. producers of LPTs that are believed to have accounted for the vast majority of U.S. domestic production of LPTs.[14] U.S. import data and related information are based on the questionnaire responses of 12 U.S. importers of LPTs that are believed to have accounted for the substantial majority of U.S. imports of LPTs in 2023 and throughout the period for which data were collected, including all or virtually all imports from South Korea and a large majority of imports from nonsubject sources. Foreign industry data and related information are based on the questionnaire responses of all four known South Korean producers of LPTs and accounted for virtually all of U.S. imports of LPTs from South Korea during 2023. Responses by U.S. producers, importers, purchasers, and foreign producers of LPTs to a series of questions concerning the significance of the existing antidumping and countervailing duty orders and the likely effects of revocation of such orders are presented in appendix D.

[14] While aggregated U.S. producer trade data are presented as public in this report, aggregated U.S. producer net sales and financial results are presented as confidential as total shipments include ***.

Commerce's reviews[15]

Administrative reviews

Commerce has completed nine administrative reviews of the outstanding antidumping duty order on LPTs from South Korea.[16] The results of the administrative reviews are shown in table I-4.

Table I-4
LPTs: Administrative reviews of the antidumping duty order for South Korea

Date results published (as amended)	Period of review	Producer or exporter	Margin (percent)
82 FR 51395 November 6, 2017	Feb. 16, 2012 - July 31, 2013	Hyosung Corporation	9.09
82 FR 51395 November 6, 2017	Feb. 16, 2012 - July 31, 2013	Hyundai Heavy Industries Co., Ltd	13.82
82 FR 51395 November 6, 2017	Feb. 16, 2012 - July 31, 2013	ILJIN Electric Co., Ltd	11.73
82 FR 51395 November 6, 2017	Feb. 16, 2012 - July 31, 2013	ILJIN	11.73
82 FR 51395 November 6, 2017	Feb. 16, 2012 - July 31, 2013	LSIS Co., Ltd	11.73
84 FR 54843, October 11, 2019	Aug. 1, 2013 - July 31, 2014	Hyosung Corporation	8.74
85 FR 40247, June 5, 2020	Aug. 1, 2013 - July 31, 2014	Hyundai Heavy Industries Co., Ltd	16.13
85 FR 40247, June 5, 2020	Aug. 1, 2013 - July 31, 2014	ILJIN Electric Co., Ltd	12.44
85 FR 40247, June 5, 2020	Aug. 1, 2013 - July 31, 2014	ILJIN	12.44
85 FR 40247, June 5, 2020	Aug. 1, 2013 - July 31, 2014	LSIS Co., Ltd	12.44
84 FR 54843 October 11, 2019	Aug. 1, 2014 - July 31, 2015	Hyosung Corporation	2.99
82 FR 13432 March 13, 2017	Aug. 1, 2014 - July 31, 2015	Hyundai Heavy Industries Co., Ltd	60.81
82 FR 13432 March 13, 2017	Aug. 1, 2014 - July 31, 2015	ILJIN Electric Co., Ltd	2.99
82 FR 13432 March 13, 2017	Aug. 1, 2014 - July 31, 2015	ILJIN	2.99

Table continued.

[15] Commerce has not issued any scope rulings since the completion of the last five-year review. In addition, since the imposition of the order, Commerce has not conducted any circumvention inquiries, new shipper reviews, scope inquiries, or made a duty absorption finding regarding LPTs from Korea.

[16] For previously reviewed or investigated companies not included in an administrative review, the cash deposit rate continues to be the company-specific rate published for the most recent period.

Table I-4 Continued
LPTs: Administrative reviews of the antidumping duty order for South Korea

Date results published (as amended)	Period of review	Producer or exporter	Margin (percent)
82 FR 13432 March 13, 2017	Aug. 1, 2014 - July 31, 2015	LSIS Co., Ltd	2.99
86 FR 38980 July 23, 2021	Aug. 1, 2015 – July 31, 2016	Hyosung Corporation	0.00
86 FR 38980 July 23, 2021	Aug. 1, 2015 – July 31, 2016	Hyundai Heavy Industries Co., Ltd	0.00
86 FR 38980 July 23, 2021	Aug. 1, 2015 – July 31, 2016	ILJIN Electric Co., Ltd	0.00
83 FR 11679 March 16, 2018	Aug. 1, 2015 – July 31, 2016	ILJIN	60.81
83 FR 11679 March 16, 2018	Aug. 1, 2015 – July 31, 2016	LSIS Co., Ltd	60.81
84 FR 16461 April 19, 2019	Aug. 1, 2016 – July 31, 2017	Hyosung Corporation	15.74
84 FR 16461 April 19, 2019	Aug. 1, 2016 – July 31, 2017	Hyundai Heavy Industries Co., Ltd./Hyundai Electric & Energy Systems Co., Ltd	60.81
84 FR 16461 April 19, 2019	Aug. 1, 2016 – July 31, 2017	ILJIN Electric Co., Ltd	15.74
84 FR 16461 April 19, 2019	Aug. 1, 2016 – July 31, 2017	ILJIN	15.74
84 FR 16461 April 19, 2019	Aug. 1, 2016 – July 31, 2017	LSIS Co., Ltd	15.74
85 FR 21827 April 20, 2020	Aug. 1, 2017 – July 31, 2018	Hyosung Heavy Industries Corporation	37.42
85 FR 21827 April 20, 2020	Aug. 1, 2017 – July 31, 2018	Hyundai Electric & Energy Systems Co., Ltd	60.81
85 FR 21827 April 20, 2020	Aug. 1, 2017 – July 31, 2018	Iljin Electric Co., Ltd	37.42
85 FR 21827 April 20, 2020	Aug. 1, 2017 – July 31, 2018	Iljin	37.42
86 FR 30915 June 10, 2021	Aug. 1, 2018 – July 31, 2019	Hyosung Heavy Industries Corporation	52.47
86 FR 30915 June 10, 2021	Aug. 1, 2018 – July 31, 2019	Hyundai Electric & Energy Systems Co., Ltd	52.47
86 FR 30915 June 10, 2021	Aug. 1, 2018 – July 31, 2019	Iljin Electric Co., Ltd	52.47
86 FR 30915 June 10, 2021	Aug. 1, 2018 – July 31, 2019	Iljin	52.47
87 FR 18356 March 30, 2022	Aug. 1, 2019 - July 31, 2020	Hyosung Heavy Industries Corporation	9.09
87 FR 18356 March 30, 2022	Aug. 1, 2019 - July 31, 2020	Hyundai Electric & Energy Systems Co., Ltd	9.09
87 FR 18356 March 30, 2022	Aug. 1, 2019 - July 31, 2020	Iljin Electric Co., Ltd	9.09
87 FR 18356 March 30, 2022	Aug. 1, 2019 - July 31, 2020	Iljin	9.09

Table continued.

Table I-4 Continued
LPTs: Administrative reviews of the antidumping duty order for South Korea

Date results published (as amended)	Period of review	Producer or exporter	Margin (percent)
88 FR 16236 March 16, 2023	Aug. 1, 2020 - July 31, 2021	Hyosung Heavy Industries Corporation	4.32
88 FR 16236 March 16, 2023	Aug. 1, 2020 - July 31, 2021	Hyundai Electric & Energy Systems Co., Ltd	4.32
88 FR 16236 March 16, 2023	Aug. 1, 2020 - July 31, 2021	Iljin Electric Co., Ltd	4.32
88 FR 16236 March 16, 2023	Aug. 1, 2020 - July 31, 2021	Iljin	4.32
88 FR 16236 March 16, 2023	Aug. 1, 2020 - July 31, 2021	LSIS Co., Ltd	4.32
88 FR 51282 August 3, 2023	Aug. 1, 2021 - July 31, 2022	N/A (administrative review rescinded)	N/A
88 FR 71829 October 18, 2023	Aug. 1, 2022 - July 31, 2023	N/A (administrative review ongoing)	N/A

Source: Cited Federal Register notices.

Note: Commerce rescinded its administrative review covering the period of Aug. 1, 2021 - July 31, 2022 in the absence of suspended entries of subject merchandise during the period of review. Commerce's administrative review covering the period of Aug. 1, 2022 - July 31, 2023 was initiated on October 18, 2023 and is currently ongoing.

Changed circumstances reviews

Commerce has conducted two changed circumstances reviews with respect to LPTs from South Korea. On September 5, 2018, Commerce found Hyundai Electric & Energy Systems Co., Ltd. to be the successor-in-interest to Hyundai Heavy Industries Co., Ltd.[17] On September 26, 2023, Commerce found HD Hyundai Electric Co., Ltd. to be the successor-in-interest to Hyundai Electric & Energy Systems Col, Ltd. in the context of the antidumping order on LPTs from South Korea.[18]

Five-year reviews

Commerce has issued the final result of its expedited review with respect to LPTs from South Korea. In the original investigation, Commerce calculated dumping margins of 29.04 percent for Hyosung Corporation, 14.95 percent for Hyundai Heavy Industries Co., Ltd., and

[17] 83 FR 45094, September 5, 2018.
[18] 88 FR 65950, September 26, 2023.

22.00 percent for all others.[19] In its expedited first five-year review, Commerce determined that revocation of the antidumping duty order on LPTs from South Korea would be likely to lead to continuation or recurrence of dumping, and that the magnitude of the dumping margins likely to prevail would be weighted-average dumping margins up to 29.04 percent.[20] In its expedited second five-year review, Commerce again determined that revocation of the antidumping duty order on LPTs from South Korea would be likely to lead to continuation or recurrence of dumping, and that the magnitude of the dumping margins likely to prevail would be weighted-average dumping margins up to 29.04 percent. [21]

The subject merchandise

Commerce's scope

In the current proceeding, Commerce has defined the scope as follows:[22]

> *The scope of this order covers large liquid dielectric power transformers (LPTs) having a top power handling capacity greater than or equal to 60,000 kilovolt amperes (60 megavolt amperes), whether assembled or unassembled, complete or incomplete.*
>
> *Incomplete LPTs are subassemblies consisting of the active part and any other parts attached to, imported with or invoiced with the active parts of LPTs. The "active part" of the transformer consists of one or more of the following when attached to or otherwise assembled with one another: the steel core or shell, the windings, electrical insulation between the windings, the mechanical frame for an LPT.*
>
> *The product definition encompasses all such LPTs regardless of name designation, including but not limited to step-up transformers, step-down transformers, autotransformers, interconnection transformers, voltage regulator transformers, rectifier transformers, and power rectifier transformers.*

[19] 77 FR 40857, July 11, 2012.
[20] 82 FR 51604, November 7, 2017.
[21] 89 FR 330, January 3, 2024.
[22] 89 FR 330, January 3, 2024. Commerce's Issues and Decision Memorandum for the Expedited Second Sunset Review of the Antidumping Duty Order on Large Power Transformers from the Republic of Korea, p. 2.

U.S. tariff treatment

LPTs are currently provided for in the Harmonized Tariff Schedule of the United States ("HTS") under subheadings 8504.23.00 and 8504.90.96 and reported for statistical purposes under statistical reporting numbers: 8504.23.0041, 8504.23.0045, 8504.23.0080, 8504.90.9634, 8504.90.9638, 8504.90.9642, and 8504.90.9646.[23] Originating goods of South Korea are eligible for duty-free entry under subheading 8504.23.00. The general rates of duty are 1.6 percent ad valorem for HTS subheading 8504.23.00 and "Free" for HTS subheading 8504.90.96.[24] Originating goods of China imported under HTS subheadings 8504.23.00 and 8504.90.96 are subject to an additional 25 percent ad valorem duty under section 301 of the Trade Act of 1974.[25]

Certain inputs involved in the manufacture of LPTs may be subject to additional duties. For example, grain-oriented electrical steel ("GOES") from certain sources is subject to an additional 25 percent ad valorem duty on steel articles, effective March 23, 2018, under Section 232 of the Trade Expansion Act of 1962, as amended.[26] GOES was also the focus of an investigation conducted by the U.S. Department of Commerce Bureau of Industry and Security pursuant to Section 232 of the Trade Expansion Act of 1962, as amended. This investigation was released in July 2021, but the U.S. Department of Commerce did not amend the ad valorem tariff rate on GOES after this authorization.[27]

Decisions on the tariff classification and treatment of imported goods are within the authority of U.S. Customs and Border Protection.

[23] On July 1, 2013, 8504.23.0041 and 8504.23.0045 replaced 8504.23.0040. On January 1, 2015, 8504.90.9540 was divided into 8504.90.9534, 8504.90.9538, 8504.90.9542, and 8504.90.9546. On July 1, 2016, these were replaced by 8504.90.9634, 8504.90.9638, 8504.90.9642, 8504.90.9646, respectively. Note that these statistical reporting numbers also contain products outside the scope of this review.

[24] USITC, HTS (2024) Revision 1, Publication 5491, September 2023, pp. 2-3.

[25] 83 FR 28710, June 20, 2018. See also HTS heading 9903.88.01 and U.S. notes 20(a) and 20(b) to subchapter III of chapter 99 and related tariff provisions for this duty treatment. USITC, HTSUS (2024) Revision 1, Publication 5491, January 2024, pp. 99-III-19 – 99-III-20, 99-III-22, 99-III-301 – 99-III-304, 99-III-307 – 99-III-309.

[26] GOES from certain sources may not be subject to duties, face tariff-rate quotas, or absolute quotas. 83 FR 11625, December 11, 2018.

[27] 86 FR 64606, November 18, 2021.

Description and applications[28]

LPTs are large, heavy pieces of capital equipment (figure I-2). There is substantial variation in the dimensions and weight of individual LPTs. A typical three-phase, 115-13.8 kV generator step-up transformer weighs about 110 tons and is about 25 feet long, 16 feet wide, and 20 feet high. A typical three-phase, 765-138 kV transmission transformer, on the other hand, weighs about 410 tons and is 40 feet long, 56 feet wide, and 45 feet high (table I-4).[29] The life spans of LPTs range from 15 to 40 years, though their targeted life span is approximately 30 years.[30] [31]

[28] Unless otherwise noted, this information is based *on Large Power Transformers from Korea, Inv. No. 731-TA-1189 (Review), USITC Publication 4826*, September 2018 ("First review publication"), p. I-10.

[29] U.S. Department of Energy (DOE), "Large Power Transformers and the U.S. Electric Grid," April 2014, p. 7, https://www.energy.gov/ceser/articles/large-power-transformers-and-us-electric-grid-report-update-april-2014.

[30] Department of Commerce (DOC), "The Effect of Imports of Transformers and Transformer Components on the National Security," October 15, 2020, p. 185, https://www.bis.doc.gov/index.php/documents/section-232-investigations/2790-redacted-goes-report-20210723-ab-redacted/file.

[31] Volt-amperes (VA) measure the voltage times the current. It is a measure of apparent power in AC circuits. Volts (V) measure electric potential difference, which is the amount of work needed to move a charge from one point to another. LPTs are rated in MVA, which is a function of its nominal voltage (measured in V), its maximum current capacity (measured in amperes), and number of windings. Daelim Transformer, "Ultimate Guide to MVA Transformer," accessed July 16, 2024, https://www.daelimtransformer.com/mva-transformer.html; Awati, "Volt-Ampere (VA)," May 2022, https://www.techtarget.com/whatis/definition/volt-ampere-VA; Geek for Geeks, "Difference Between Electric Potential and Potential Difference," March 4, 2024, https://www.geeksforgeeks.org/electric-potential-vs-potential-difference/.

Figure I-2
LPTs: Installed large power transformer

Source: Gollz.com, http://www.frequencyconverter.net/transformer-power-supply.html (accessed May 14, 2024).

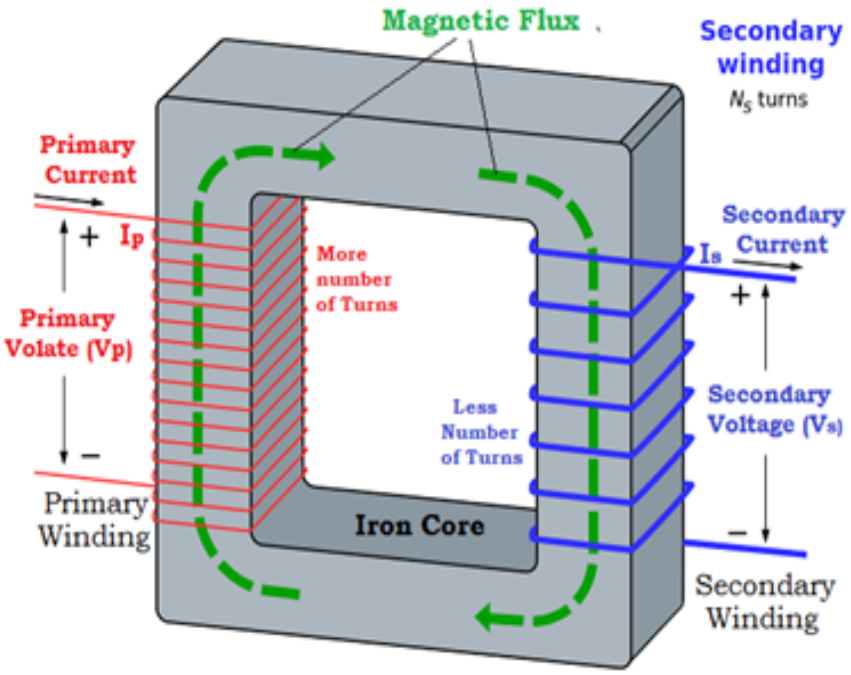
Table I-5
LPTs: Typical large power transformer characteristics

Item	Voltage rating (Primary-Secondary)	MVA rating	Weight	Dimensions (feet) (Length x Width x Height)
Transmission transformer: Three Phase	230–115kV	300	170 tons (340,000 lbs.)	27 x 21 x 25
Transmission transformer: Three Phase	345–138kV	500	335 tons (670,000 lbs.)	25 x 45 x 30
Transmission transformer: Three Phase	765–138kV	750	410 tons (820,000 lbs.)	40 x 56 x 45
Transmission transformer Single Phase	765–345kV	500	235 tons (470,000 lbs.)	30 x 40 x 40
Generator step-up transformer Three Phase	115–13.8kV	75	110 tons (220,000 lbs.)	25 x 16 x 20
Generator step-up transformer Three Phase	345-–13.8kV	300	185 tons (370,000 lbs.)	40 x 21 x 27
Generator step-up transformer Single Phase	345–22kV	300	225 tons (450,000 lbs.)	20 x 35 x 30
Generator step-up transformer Single Phase	765–26kV	500	325 tons (650,000 lbs.)	25 x 33 x 40

Source: DOE, Large Power Transformers and the U.S. Electric Grid, April 2014, p. 7.

LPTs use electromagnetic induction between circuits to increase, decrease, or regulate power. Electromagnetic induction takes advantage of the fact that electricity moving through a conductor creates a magnetic field. Induction occurs when that electromagnetic field crosses a second electrical conductor and thereby generates a voltage in the second conductor although the two conductors are not directly connected. This requires a fluctuating magnetic field typically generated by alternating current entering an input conductor (figure I-3).

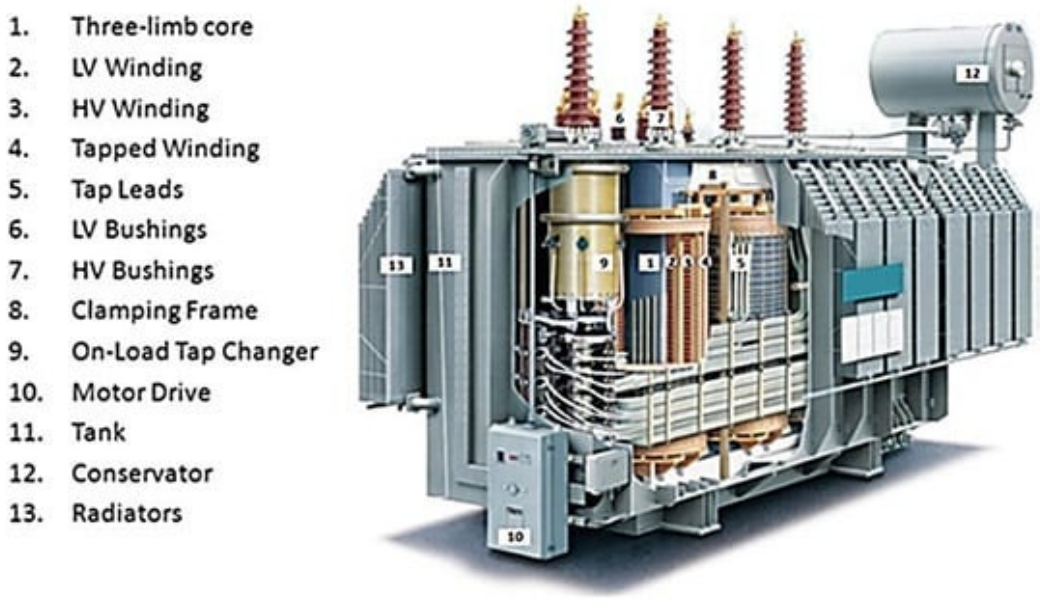
Figure I-3
LPTs: Functioning of a transformer



Source: Servomax, "Step-Down Transformer is an Essential Device for Domestic and Industrial Use," November 20, 2019, https://www.servomax.in/blog/step-down-transformer-is-an-essential-device-for-domestic-and-industrial-use/.

LPTs have an "active part" where the electromagnetic induction occurs that consists of the core, the windings, and electrical insulation between the windings (figure I-4). The core is made of GOES, a highly permeable electrical steel, which is wound with primary (electrical power input) and secondary (output) conductors. The thin GOES in the core is laser scried and coated with a glass film known as carlite. The core contains the magnetic flux generated by the alternating current moving through the primary conductor. The size of the core is minimized to reduce electrical losses and to reduce the size of the LPT for transport through tunnels and under bridges.

Figure I-4
LPTs: Large power transformer showing major components



Source: Costa, Large-Power Transformers, Energies, 15 (13), 4697, June 27, 2022, https://doi.org/10.3390/en15134697.

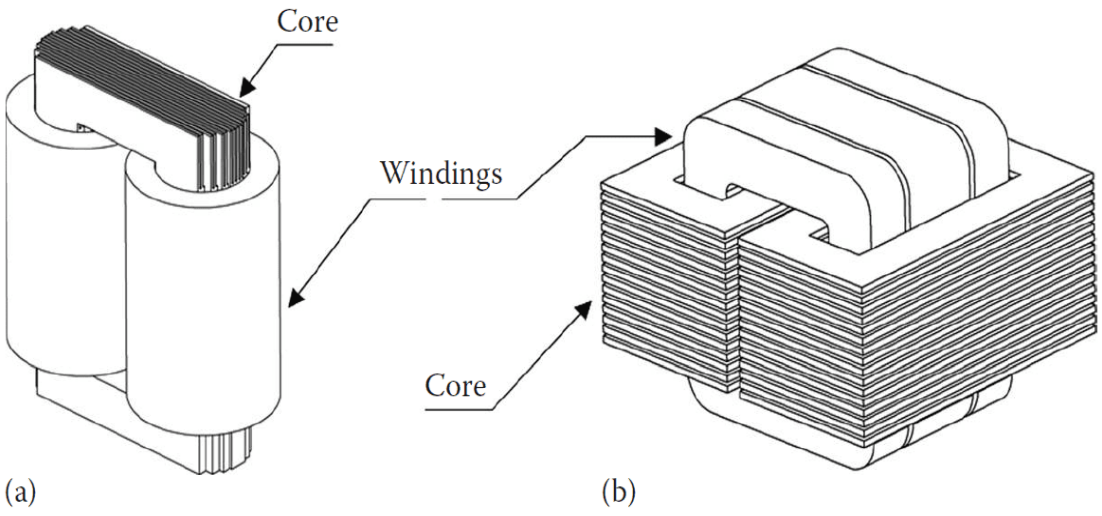
Windings are the primary and secondary conductors that are wound around the core. The windings are usually comprised of thin strands of copper wire insulated with paper. Between the windings are paper insulation and spacers of pressboard. Typically, the low-voltage winding is placed closest to the core and the high-voltage winding is placed outside the low-voltage winding, which minimizes the amount of insulation required. The pattern of windings varies depending on the size, type, and design of the transformer and the voltage and the current. The ratio of turns between the primary and secondary windings determines the output voltage. The winding with more turns is the high-voltage winding and the one with fewer turns is the low-voltage winding. Inserting taps into the winding can change the ratio of the turns and, therefore, the output voltage. These taps can be changed either manually or automatically by a motor.[32]

[32] First review publication, pp. I-16-17.

LPTs are produced as “single-phase” or “three-phase” models. A single-phase LPT has one primary and secondary set of windings, while a three-phase LPT has three primary and secondary windings around three core limbs. With alternating current, the voltage and current rise and fall along a sine wave, thus the current periodically stops. With three-phase transformers, when the current stops in one phase it is flowing in the other two, so the output does not stop. ***. However, using three single-phase transformers is less efficient than using one three-phase transformer.[33]

There are two typical configurations of the core and windings, the core form and the shell form (figure I-5). In the shell form, the windings of the primary and secondary inputs are wrapped around the center leg of the magnetic core, in rectangular shaped or “pancake” windings, and more of the windings are enclosed by the core. Shell form LPTs use more GOES than core types. In performance, shell form LPTs are more resilient to short circuits in the transmission system and are frequently used in industrial applications, such as steel mills where short circuits frequently occur.

Figure I-5
LPTs: Core form (a) and shell form (b) configurations of core and windings



Source, AllumiaX, Difference Between Core Form and Shell Form Power Transformers, https://www.allumiax.com/difference-between-core-form-and-shell-form-power-transformers-by-generalpac (accessed May 15, 2024).

[33] Kolstad, “Single-Phase Transformers: How Do They Work?,” Tameson, April 8, 2022, https://tameson.com/pages/single-phase-transformers.

The active part of the transformer is placed in a metal tank. This tank is filled with a fluid, such as mineral oil or natural or synthetic ester, which dissipates heat generated by the transformer.[34] As the oil heats, it circulates to a radiator where it cools as the heat dissipates. Fans are generally attached to aid in cooling and heat exchangers may also be used. As the oil expands, it may travel to a separate tank attached to a frame called an oil conservator.[35]

Bushings provide the electrical connection between a transformer and the electrical transmission network.[36] [37] A single-phase transformer has four bushings and a three-phase transformer has six bushings. Other parts include tap changers, power cable connectors, gas-operated relays (to detect certain types of problems and minimize subsequent damage within the transformers), thermometers, pressure relief devices, dehydrating breathers, oil level indicators, and other controls. Sensors incorporated into a transformer may monitor a range of operating conditions, and related monitoring and control equipment and software may record the data, automatically control certain functions (such as the level of cooling), allow for remote monitoring, and perform condition analysis.

Ratings

The size of an LPT is determined by the load measured by megavolt-amperes ("MVA"), the secondary output voltage, and the primary input voltage. In the original investigation, the MVA capacity was used in defining LPTs. The MVA rating system is an industry standard and is based on the cooling system. In the United States, transformers are rated based on the power output they are capable of delivering continuously at a specified rated voltage and frequency under usual operating conditions without exceeding prescribed internal temperature limitations.[38] Typically, customer requests for bids will specify the MVA for the transformer at 55 degrees Celsius and at one or two stages of forced cooling. These ratings are displayed as three numbers: for example, 115/153/192 MVA. The higher ratings reflect the capacity of the

[34] Electrical-Technology, "Twelve Different Parts of a Transformer and their Functions," https://electrical-technology.com/parts-of-transformer.html (accessed May 15, 2024).

[35] Grant Transformers Company Web site, "14 Different parts of Transformers and their Functions," December 12, 2023, https://grant-transformers.com.au/different-parts-of-transformers-with-functions/.

[36] *Investigation No. 731-TA-1189 (Final): Large Power Transformers from Korea, Confidential Report, INV-KK-082*, July 30, 2012, as revised in INV-KK-083, August 1, 2012 ("Original confidential report"), p. I-6-17. First review publication, pp. I-10-21.

[37] U.S. Department of Energy, "Electric Grid Supply Chain Review," February 24, 2022, p. 12, https://www.energy.gov/sites/default/files/2022202/Electric%20Grid%20Suply%20Chain%20Report%20-%Final.pdf.

[38] First review publication, pp. I-21.

transformer with more cooling (more fans and pumps running). The first rating is "oil natural, air natural," meaning that the fans are not aiding the cooling, and the second and third ratings are with progressively more cooling added. In some generation plants where transformers may be running at full capacity all the time, a transformer might only have a single rating.

Losses

LPTs are more than 99 percent efficient. There are, however, several types of power losses in LPTs, including no-load losses, load losses, and auxiliary losses. According to the Copper Development Association, "No-load losses are caused by the magnetizing current needed to energize the core of the transformer, and do not vary according to the loading on the transformer. They are constant and occur 24 hours a day, 365 days a year, regardless of the load . . . "Load losses are primarily due to the resistance of the copper conductor and eddy currents induced in the core by the magnetic field. Auxiliary losses are the power required for fans and other electrical equipment.[39]

Applications[40]

LPTs are used to increase or decrease voltage in the electric transmission system. Power, as measured in volt-amperes,[41] is typically transmitted at a high voltage and low current (amperage) because transmission at higher amperages requires more cable, resulting in greater power losses and expense. Power is typically generated at less than 35 kilovolts (kV), increased (stepped up) for transmission to 69 to 765 kV, then decreased (stepped down) for distribution from 15 to 34.5 kV (figure I-6).[42] LPTs are the equipment in the electric power grid that increase or decrease these voltages.

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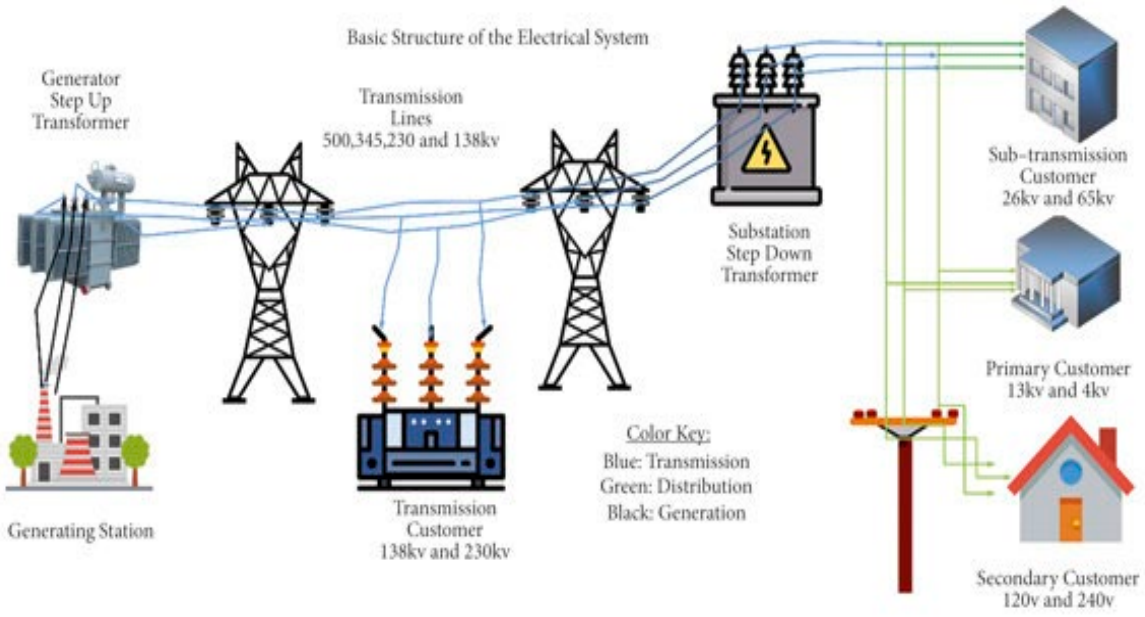
[39] Copper Development Association, "Introduction to Transformer Losses," https://copper.org/environment/sustainable-energy/transformers/education/trans_losses.php? (accessed May 14, 2024).

[40] This section briefly summarizes the applications for large power transformers. For additional information on circuit mile transmission, users and capacity, see North American Electric Reliability Corporation (NERC), "Transmission Availability Data System (TADS)," January 2023, p. 26, https://www.nerc.com/pa/RAPA/tads/Key_TADS_Documents/2023_TADS_DRI.pdf; U.S. Department of Energy (DOE), "Annual U.S. Transmission Data Review," March 2018, p. 6, https://www.energy.gov/sites/prod/files/2018/03/f49/2018%20Transmission%20Data%20Review%20FINAL.pdf; DOE, EIA, "Electric Power Annual 2022," October 19, 2023, https://www.eia.gov/electricity/annual/html/epa_04_04.html; American Public Power Association, "2023 Public Power Statistics Report," 2023, pp. 5-6, https://www.publicpower.org/system/files/documents/2023-Public-Power-Statistical-Report.pdf.

[41] One MVA is equal to 1,000 kilovolt-amperes (kVA). One kVA is equal to 1,000 volt-amperes.

[42] Amperage is decreased when the voltage is stepped up and increased when the voltage is stepped down.

Figure I-6
Examples of electric power transmission and distribution voltages



Source*:* Aman and Ren, "Optimal Siting of Distributed Generation Unit in Power Distribution System Considering Voltage Profile and Power Losses, Mathematical Problems in Engineering," January 10, 2022, p. 14.

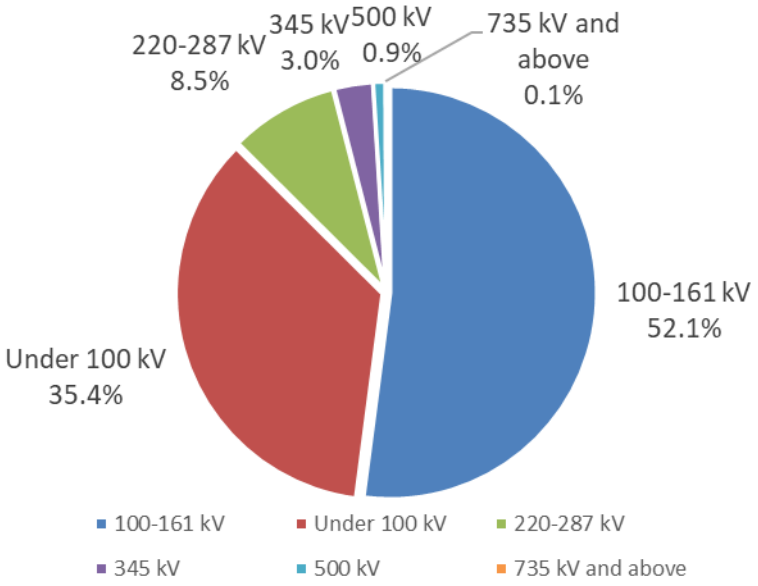
Three common types of LPTs include step-up transformers, step-down transformers, and autotransformers. Generator step-up transformers increase voltage from electric power generation plants for transmission through the electric grid. Step-down transformers are used at transmission substations to step down (decrease) voltages prior to distribution to consumers such as businesses and residences. Autotransformers connect transmission lines of different voltages. Some companies also produce mobile transformers, which are transportable and used to replace or augment stationary transformers for emergency service, routine maintenance, temporary power, and seasonal demand.[43]

In the United States, more than half of electricity transmission lines were at 100-161 kV (figure I-7 and corresponding table I-6). The second largest share of electricity transmission lines were at under 100 kV, and the third-largest share is at 220 to 287 kV.[44]

[43] Delta Star, "Mobile Substations," p. 3, https://issuu.com/deltastarinc/docs/dse-mobiletransformer2023 (accessed May 14, 2024).

[44] Homeland Infrastructure Foundation-Level data cited in ESRI ArcGIS, U.S. Electric Power Transmission Lines, updated March 11, 2024, https://hub.arcgis.com/datasets/d4090758322c4d32a4cd002ffaa0aa12_0/about.

Figure I-7
Existing U.S. transmission, number of lines by kV, 2024



Source: Homeland Infrastructure Foundation-Level data cited in ESRI ArcGIS, U.S. Electric Power Transmission Lines, updated March 11, 2024, https://hub.arcgis.com/datasets/d4090758322c4d32a4cd002ffaa0aa12_0/about, accessed July 15, 2024.

Table I-6
Existing U.S. transmission, number of lines by kV, 2024

Voltage Class	Number of Transmission Lines
100-161 kV	44,560
Under 100 kV	30,295
220-287 kV	7,282
345 kV	2,588
500 kV	810
735 kV and above	46
Total	85,581

Source: Homeland Infrastructure Foundation-Level data cited in ESRI ArcGIS, U.S. Electric Power Transmission Lines, updated March 11, 2024, https://hub.arcgis.com/datasets/d4090758322c4d32a4cd002ffaa0aa12_0/about, accessed July 15, 2024.

The users of LPTs include independent firms that generate electricity (independent power producers ("IPPs")), electric utilities, and industrial customers. The users in the electric power industry, IPPs, and utilities, are defined below:

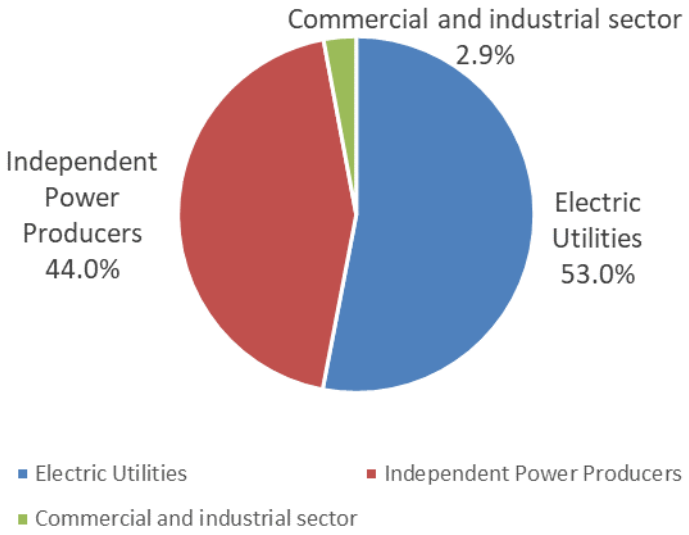
- **Independent power producer**: An IPP is an entity that primarily produces electricity for sale on the wholesale market. It is not a utility, does not own electricity transmission, and does not have a designated service area. IPPs may sign power purchase agreements (PPAs) with utilities. A PPA is a long-term agreement between a utility and an IPP to purchase electricity.
- **Electric utilities:**
    - **Investor-owned utility ("IOU"):** An IOU is a for-profit utility.
    - **Publicly owned utility ("POU"):** A POU is a nonprofit state or local government entity.
    - **Cooperative electric utilities**: Utilities that are owned by their members.
    - **Federal electric utilities**: Utilities that are owned by the U.S. government, such as the Tennessee Valley Authority ("TVA").

Utilities accounted for 53 percent of cumulative U.S. utility-scale electric generating capacity as of the end of 2022, while IPPs accounted for 44 percent and commercial and industrial firms for 3 percent (figure I-8 and corresponding table I-7).[45] Among utilities, investor-owned accounted for 36 percent capacity, publicly-owned for 36 percent, federal utility for 6 percent, and cooperative utilities for 3 percent (figure I-9 and corresponding table I-8). However, there are many more POUs and cooperative utilities than IOUs. In 2021, there were 1,996 POUs, 894 cooperative utilities, but only 179 IOUs.[46]

[45] DOE, EIA, *Electric Power Annual 2022*, October 19, 2023, table 4.4, https://www.eia.gov/electricity/annual/html/epa_04_04.html.

[46] American Public Power Association, 2023 Public Power Statistical Report, 2023, p. 17, https://www.publicpower.org/system/files/documents/2023-Public-Power-Statistical-Report.pdf.

Figure I-8
Existing generator nameplate capacity by producer type, 2022



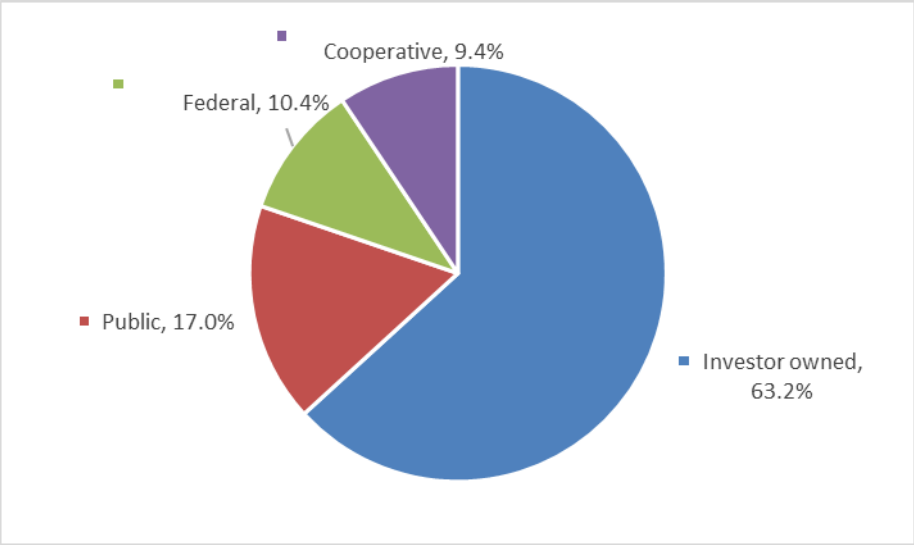
Source: DOE, EIA, Electric Power Annual 2022, October 19, 2023, table 4.4, https://www.eia.gov/electricity/annual/html/epa_04_04.html.

Table I-7
Existing generator nameplate capacity by producer type, 2022

Producer Type	Nameplate Capacity
Electric Utility	664,893
Independent	551,870
Commercial and Industrial	36,979
Total	1,253,743

Source: DOE, EIA, Electric Power Annual 2022, October 19, 2023, table 4.4, https://www.eia.gov/electricity/annual/html/epa_04_04.html.

Figure I-9
Share of utility generator nameplate capacity, by type of utility, 2021



Source: Public Power Statistics Report 2023, pp. 5-6

Table I-8
Share of utility generator nameplate capacity, by type of utility, 2021

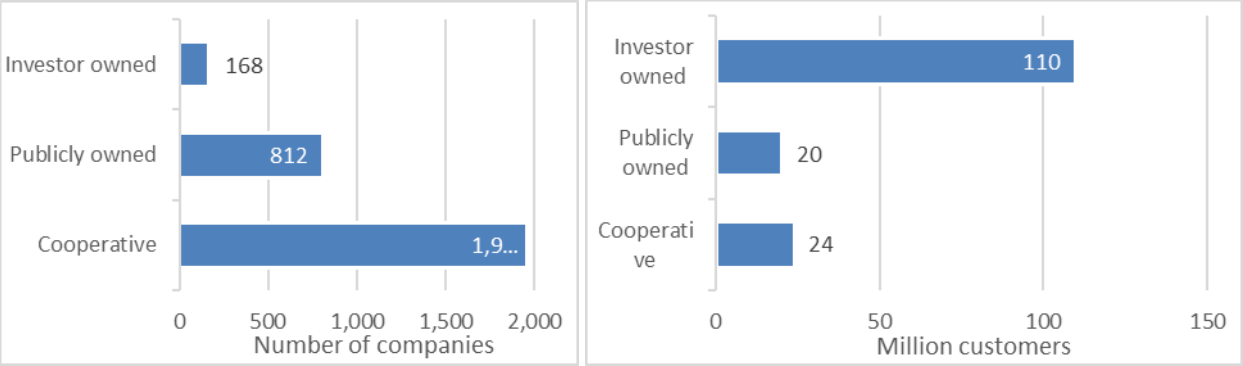
Item	Total
Investor owned	439,213
Public	118,372
Federal	72,129
Cooperative	65,134
Total	325,494

Source: Public Power Statistics Report 2023, pp. 5-6.

IOUs and independent transmission companies are the largest owners of electricity transmission in the United States, accounting for 70 percent of transmission ownership (by miles of transmission lines owned) 230 kV or higher (figure I-10 and corresponding table I-9). Ownership of the rest of U.S. transmission is split among several entities, with federal utilities accounting for 14 percent of transmission 230 kV or higher, POUs for 7 percent, and cooperative utilities for 6 percent. For all transmission voltages, IOUs and transmission companies still own more than half of transmission. However, the share of all transmission

owned by POUs and cooperatives is higher than for only 230 kV and above, while the share of all transmission owned by federal utilities is less than for only 230 kV or higher transmission.[47]

Figure I-10
U.S. electric utilities by ownership type, by number of companies and millions of customers , 2017



Source: U.S. Energy Information Administration, Investor-owned utilities served 72% of U.S. electricity customers in 2017, August 15, 2019.

Table I-9
U.S. electric utilities by ownership type, by number of companies and millions of customers , 2017

Item	Number of companies	Number of customers (millions)
Investor owned	168	110
Publicly owned	812	20
Cooperative	1,958	24
Total	2,938	154

Source: U.S. Energy Information Administration, Investor-owned utilities served 72% of U.S. electricity customers in 2017, August 15, 2019.

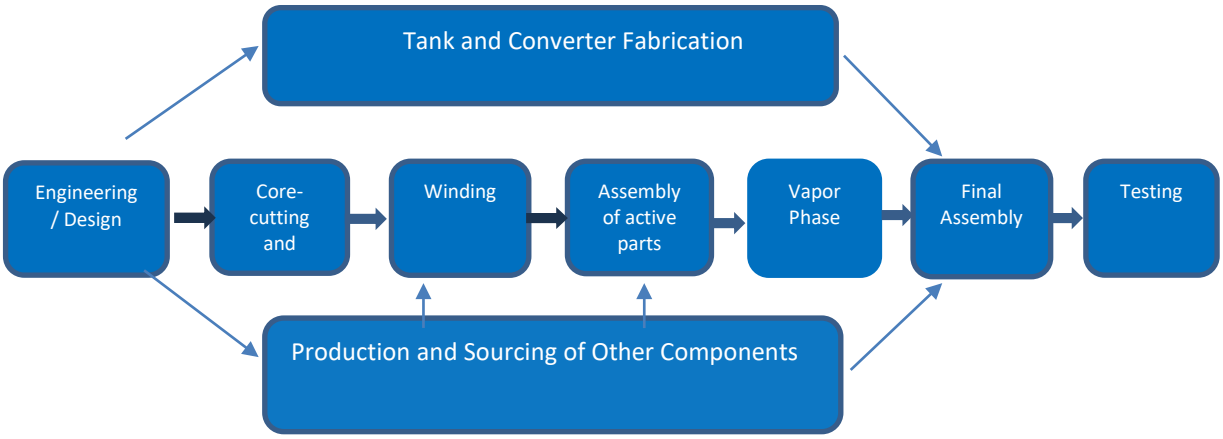
Manufacturing processes

LPTs are manufactured to the individual specifications of the customer. The first step, designing the transformer, is complex. It entails balancing the optimum transformer design, the costs of materials (e.g., steel, copper, and cooling oil), electrical losses, manufacturing labor hours, plant capability constraints, and shipping constraints, such as tunnel and bridge dimensions.

[47] Stan Mark Kaplan, *Electric Power Transmission: Background and Policy Issues*, April 14, 2009, Congressional Research Service, p. 4, https://www.everycrsreport.com/files/20090414_R40511_ef62ebf281f43f4182e3a3d8c19478074d862d10.pdf ; Platts, "2015 UDI Directory of Electric Power Producers and Distributors," *123rd Edition of the Electrical World Directory*, 2014, vi-vii, https://www.platts.com/im.platts.content/downloads/udi/eppd/eppddir.pdf.

The manufacture of the LPT takes place along several lines simultaneously. The tank and conservator are fabricated and painted in a metal shop, the active part (core and windings) is constructed, and other components are made in-house or sourced depending on the firm and the component (figure I-11).[48] LPT manufacturers work with customers from design through shipment and installation. Customers will often review the transformer design and come to the plant to inspect the transformers.[49] LPTs take months to design and build. A typical 230 kV LPT might take 28 to 44 weeks from the start of the design process to delivery, with 8 to 12 weeks for engineering and drafting, 1 to 2 weeks for design approval, 8 to 12 weeks to get the necessary materials, 8 to 12 weeks for manufacturing, 1 to 2 weeks for testing and shipment preparation, and 1 to 4 weeks for shipping.[50]

Figure I-11
LPTs: Production process for core form transformers



Source: Original confidential report, pp. I-15.

The extent to which firms produce components in-house varies by company. For example, some companies may produce bushings in-house, while others source them from suppliers. Similarly, whether firms produce radiators in-house varies by company. U.S. utilities may specify the companies from which they want the LPT manufacturer to purchase components, such as monitoring equipment and bushings. U.S. utilities often want domestic bushings regardless of whether the LPT is produced domestically.[51]

[48] First review publication, pp. I-22-24.
[49] Ibid.
[50] First review publication, p. I-22.
[51] First review publication, p. I-22.

Tank fabrication

The tank (the exterior shell of the LPT), a rectangular box-shaped fabrication made from hot-rolled, low carbon steel plates that are typically arc welded together. The tank has wall stiffeners, jack pads and lifting hooks, guides to fit the windings and core assembly inside, and a variety of access openings for maintenance. The interior is usually coated with epoxy and the exterior is painted.

The active part of the transformer

The manufacturing of the active part (the core, windings, and electrical insulation) consists of core cutting and assembly, winding, assembly of the active part, and vapor phase. The core consists of laminations of GOES shaped into the legs and yokes of the core. GOES is cut to shapes for the vertical sections of the core called limbs or legs, and the horizontal sections called the yoke. First, GOES parts are cut to shape by computerized shearing machines and these thin strips are called laminations. Second, these laminations are carefully stacked either by hand or machine to prevent damage to the electrical properties of the laminations. Third, bundles of like-shaped laminations are then bound together with epoxy polyester shrink tape to form either legs or yokes. Fourth and finally, the legs are then attached to the bottom yoke.

The windings are formed by winding an insulated copper wire conductor over a cylindrical framework, typically by hand. Spacers between various turns of conductors *** are inserted. Depending on the type of LPT being produced, different *** patterns of winding will be used. For certain transformers, this winding process can take weeks to complete.[52]

The active part is then assembled by placing the windings over the legs. It is then cleaned, inspected, and put through a pressing operation. At this stage, the top yoke is added.

The windings and the core then undergo drying operations in a vapor phase drying chamber to remove moisture from the paper, pressboard, and spaces between the windings. In the chamber, solvent vapors condense on the windings and core, resulting in heating the article, and thus evaporating moisture out of the insulation. The vapor chamber is then flooded with transformer oil to impregnate the insulation materials. Once this is complete, the chamber is drained of oil and the assembly is removed.

[52] Investigation No. 731-TA-1189 (Review): Large Power Transformers from Korea, Confidential Report, INV-QQ-099, August 28, 2018, ("First review confidential report"), p. I-31.

LPT assembly

After inspecting the active part, it is immediately moved to the tank, covered with oil, and the cover is welded on. The oil is then drained, surface moisture is vacuumed, and the transformer is filled with degasified mineral oil for final impregnation. Other components such as the bushings are also added.

Testing

Testing is performed to ensure the accuracy of voltage ratios, verify power ratings, and determine electrical impedances. Testing also simulates certain events that may affect the LPT, including lightning strikes, short circuits, over voltages (voltages in the circuit that are above the design limits), and accessories such as cooling systems, indicators, and tap changers.

Shipping

Before an LPT is shipped, bushings, fans, the control cabinet, and other components are disassembled, the oil is removed, and the tank is filled with dry air.

Manufacturing environment and production processes

The manufacturing environment and capability may substantially affect the LPT manufacturer's product reliability. LPT plants, particularly for the high voltage products, maintain almost clean room environments, especially in both windings and assembly areas; for example, dust particles will ruin an 800 kV LPT.

The operation and physical characteristics of an LPT manufacturing plant can affect whether a manufacturer is qualified by the customer to bid on a proposal or is recommended during the bid process. As part of the process of qualifying potential bidders, customers will visit LPT manufacturers, audit their production and quality processes, and verify their certifications and adherence to standards such as International Standards Organization standard 9001. Reportedly, it is important to have an advanced facility that shows well to customers, as it reflects efficient production, shorter lead times, and better delivery.

Domestic like product issues

In its original determination, the Commission defined the domestic like product as a single domestic like product coextensive with the scope of the original investigation.[53] In its first five-year review determination, the Commission again defined the domestic like product as all LPTs, coextensive with the scope of the order.[54] In its notice of institution in these current five-year reviews, the Commission solicited comments from interested parties regarding the appropriate domestic like product and domestic industry.[55] Two of three interested parties commented on the Commission's definition of the domestic like product and did not contest the Commission's definition of the domestic like product.[56] No party requested that the Commission collect data concerning other possible domestic like products in their comments on the Commission's draft questionnaires. In their prehearing brief, the domestic interested parties agreed with the definition of the domestic like product set forth in the original investigations, stating that the Commission has no reason to reconsider its findings in the original investigation and the first review that there is a single domestic like product coextensive with the Commerce's scope and consisting of all LPTs.[57] No other interested party provided further comment or contested the Commission's definition of the domestic like product during the hearing or in briefs.

[53] Original publication, p. 9. The Commission rejected respondents' request that it find Category A and Category B LPTs to be separate domestic like products. In the original investigation, respondents Hyosung Corporation and Hyundai Heavy Industries, Co. Ltd and Hyundai Corporation USA contended that the Commission should find two like products based on two separate categories. Category A included 60-300 MVA (top rated, standard step-up/step-down equivalent) power transformers for 345 kV high line system voltage, plus 60 MVA and above (top rated, standard step-up/step-down equivalent) power transformers for less than 345 kV high line system voltages; Category B included 60 MVA and above (top rated, standard step-up/step-down equivalent) power transformers for 500 kV and above high line system voltages, plus above 300 MVA (top rated, standard step-up/step-down equivalent) power transformers for 345 kV high line system voltage. Ibid., pp. I-12 to I-13.

[54] First review publication, p. 9.

[55] 88 FR 60496, September 1, 2023.

[56] Substantive Response of the domestic interested parties, p. 23; Substantive Response of Hyosung Heavy Industries Corp., p. 9; Substantive Response of HD Hyundai Electric Co., Ltd. and HD Hyundai Electric America Corporation, p. 11.

[57] Prehearing brief of the Domestic Producers, pp. 6-7.

U.S. market participants

U.S. producers

During the original investigation, five firms supplied the Commission with information on their U.S. operations with respect to LPTs. These firms accounted for virtually all U.S. production of LPTs in 2011.[58] During the first five-year review, the Commission received U.S. producer questionnaires from seven firms, which accounted for the vast majority of production of LPTs in the United States during 2017.[59]

In these current proceedings, the Commission issued U.S. producers' questionnaires to eleven firms, ten of which provided the Commission with usable information on their LPT operations during the review period. [60] These firms are believed to account for the vast majority of U.S. production of LPTs in 2023. Presented in table I-10 is a list of current domestic producers of LPTs and each company's position on continuation of the order, production locations, and share of reported production of LPTs in 2023.[61]

[58] Original publication, p. III-1.

[59] Large Power Transformers from Korea, Inv. No. 731-TA-1189 (Review), USITC Publication 4826, September 2018 ("First review publication"), p. I-7.

[60] Mitsubishi Electric Power Products, Inc. ("MEPPI") sold its Memphis manufacturing plant to Hyosung Heavy Industries Corporation in 2020 and no longer manufactures LPTs in the USA. MEPPI provided historical U.S. shipments data for 2018-20. Howard Industries Inc. ("Howard") ***. Howard's producer questionnaire response, section II-3-a, II-9-a-b. ***.

[61] U.S. producers accounting for more than *** of reported U.S. production in 2023 oppose continuation of the antidumping duty order on LPTs from South Korea.

Table I-10
LPTs: U.S. producers, positions on order, U.S. production locations, and shares of reported U.S. production, by firm, 2023

Shares in percent

Firm	Position on order	Production location(s)	Share of production
Delta Star	***	Lynchburg, VA San Carlos, CA	***
HD HPT USA	***	Montgomery, AL	***
Hitachi Energy USA	***	South Boston, VA	***
Hyosung HICO	***	Memphis, TN	***
PA Transformer	***	Canonsburg, PA	***
Prolec-GE Waukesha	***	Waukesha, WI	***
Virginia Transformer	***	Pocatello, ID Rincon, GA	***
WEG Transformers	***	Washington, MO	***
All firms	Various	Various	100.0

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

Note: ***.

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

As indicated in table I-11, two U.S. producers, HD Hyundai Power Transformers USA, Inc. ("HD HPT USA") and Hyosung HICO, Ltd ("Hyosung HICO"), are related to South Korean producers of LPTs,[62] while four additional current U.S. producers are related to producers of LPTs in nonsubject countries.[63] As indicated in table I-10, these six U.S. producers accounted for nearly *** percent of reported U.S. production in 2023. Moreover, each of these six firms is also related through corporate affiliation to importers and/or exporters of LPTs. Specifically, as discussed in greater detail in Part III, U.S. importers of LPTs related to *** import LPTs from South Korea.[64] No current U.S. producers purchase LPTs from South Korea from U.S. importers.

[62] HD HPT USA and Hyosung HICO are related to their respective parent companies, South Korean producers HD Hyundai Electric Co., Ltd. ("HDHE") and Hyosung Heavy Industries Corporation ("HHIC").

[63] *** are related to foreign producers of LPTs in nonsubject countries. *** is also related to an LPT producer in a nonsubject country.

[64] As noted in table I-12, Hitachi Energy USA and WEG Transformers directly import LPTs, but not from South Korea.

Table I-11
LPTs: U.S. producers' ownership, related and/or affiliated firms

Reporting firm	Relationship type and related firm	Details of relationship
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***

Table continued.

Table I-11 Continued.
LPTs: U.S. producers' ownership, related and/or affiliated firms

Reporting firm	Relationship type and related firm	Details of relationship
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***
***	***	***

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

U.S. importers

In the original investigation, nine U.S. importing firms supplied the Commission with usable information on their operations involving the importation of LPTs accounting for 80.1 percent of U.S. imports of LPTs during 2011. Three of those nine firms accounted for virtually all subject imports from South Korea.[65] During the first five-year review, the Commission received U.S. importer questionnaires from 10 firms, which accounted for the vast majority of total U.S. imports during 2017 and more than 95 percent of subject imports of LPTs from South Korea during 2017.[66] No U.S. producer directly imported subject merchandise, however, one U.S. producer (***) was related to a Korean LPT producer and to a U.S. importer of the subject merchandise.[67]

[65] Original publication, p. IV-1. Hyundai Corp. and HICO accounted for all of the total reported U.S. imports from South Korea in 2011.

[66] Original publication, p. IV-1.

[67] Investigation No. 731-TA-1189 (Review): Large Power Transformers from Korea, Confidential Report, INV-QQ-099, August 28, 2018 ("First review confidential report"), p. I-35.

In the current proceedings, the Commission issued U.S. importers' questionnaires to 60 firms believed to be importers of LPTs, as well as to all U.S. producers of LPTs. The Commission received questionnaire responses from 12 firms, representing a substantial majority of U.S. imports of LPTs in 2023 and throughout the period for which data were collected, including all or virtually all imports from South Korea and a large majority of imports from nonsubject sources. Table I-12 lists all responding U.S. importers of LPTs from South Korea and other sources, their headquarters, and their shares of U.S. imports in 2023.

Table I-12
LPTs: U.S. importers, their headquarters, and share of imports within each source, 2023

Share in percent

Firm	Headquarters	South Korea	Nonsubject sources	All import sources
GE-Prolec Transformers	Shreveport, LA	***	***	***
HD Hyundai Electric	Seongnam, Korea	***	***	***
HICO America	Pittsburgh, PA	***	***	***
Hitachi Energy USA	Raleigh, NC	***	***	***
Hyosung Heavy Industries	Seoul, Korea	***	***	***
ILJIN	Seoul, KOREA	***	***	***
LS Electric	Anyang, South Korea	***	***	***
MEPPI	Warrendale, PA	***	***	***
SGB-SMIT Sales	Summerville, SC	***	***	***
Siemens Energy	Orlando, FL	***	***	***
Transformateurs Delta Star	Saint-Jean-Sur-Richelieu, QC	***	***	***
WEG Transformers	Washington, MO	***	***	***
All firms	Various	100.0	100.0	100.0

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

U.S. purchasers

The Commission received 17 usable questionnaire responses from firms that bought LPTs since January 2021.[68] Nine responding purchasers are investor-owned utilities, three are engineering or construction company/power project developers, two are electric cooperative utilities, two are public utilities, and one is a mix of a public utility, investor-owned utility, and engineering or construction company/power project developer. In general, responding U.S. purchasers were located in all regions of the continental United States. Large purchasers of LPTs include ***.

[68] Of the 17 responding purchasers, 14 purchased the domestic product, four purchased imports of the subject merchandise from South Korea, and 13 purchased imports of LPTs from other sources.

Apparent U.S. consumption and market shares

Quantity

Table I-13 and figure I-12 present data on apparent U.S. consumption and U.S. market shares by quantity for LPTs. Apparent U.S. consumption by MVA top rated increased by 19.8 percent from 2021 to 2022 before declining by 1.1 percent in 2023, for a net increase of 18.5 percent during 2021-23. The share of apparent U.S. consumption for which U.S. producers accounted decreased during 2021-23 from 32.5 percent to 29.2 percent. The share of apparent U.S. consumption for which subject imports from South Korea accounted decreased from *** percent in 2021 to *** percent in 2022 before increasing to *** percent in 2023. The share of apparent U.S. consumption for which imports from nonsubject sources accounted increased from *** percent in 2021 to *** percent in 2022 before decreasing to *** percent in 2023.

Table I-13
LPTs: Apparent U.S. consumption and market shares based on quantity, by source and period

Quantity in MVA top rated; shares in percent

Source	Measure	2021	2022	2023
U.S. producers	Quantity	48,191	53,367	51,267
South Korea	Quantity	***	***	***
Nonsubject sources	Quantity	***	***	***
All import sources	Quantity	100,080	124,260	124,483
All sources	Quantity	148,271	177,627	175,750
U.S. producers	Share	32.5	30.0	29.2
South Korea	Share	***	***	***
Nonsubject sources	Share	***	***	***
All import sources	Share	67.5	70.0	70.8
All sources	Share	100.0	100.0	100.0

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

Figure I-12
LPTs: Apparent U.S. consumption based on quantity, by source and period

* * * * * * *

Source: Compiled from data submitted in response to Commission questionnaires

Value

Table I-14 and figure I-13 present data on apparent U.S. consumption and U.S. market shares by value for LPTs. Apparent U.S. consumption increased by 78.2 percent during 2021-23. U.S. producers' share of apparent U.S. consumption decreased during 2021-23 from 38.4 percent to 35.7 percent. The share of apparent U.S. consumption for which subject imports from South Korea accounted decreased from *** percent in 2021 to *** percent in 2022 before increasing to *** percent in 2023. The share of apparent U.S. consumption for which imports from nonsubject sources accounted increased from *** percent in 2021 to *** percent in 2022 before decreasing to *** percent in 2023.

Table I-14
LPTs: Apparent U.S. consumption and market shares based on value, by source and period

Value in 1,000 dollars; shares in percent

Source	Measure	2021	2022	2023
U.S. producers	Value	449,077	572,588	743,475
South Korea	Value	***	***	***
Nonsubject sources	Value	***	***	***
All import sources	Value	719,546	1,025,688	1,338,763
All sources	Value	1,168,623	1,598,276	2,082,238
U.S. producers	Share of value	38.4	35.8	35.7
South Korea	Share of value	***	***	***
Nonsubject sources	Share of value	***	***	***
All import sources	Share of value	61.6	64.2	64.3
All sources	Share of value	100.0	100.0	100.0

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

Figure I-13
LPTs: Apparent U.S. consumption based on value, by source and period

* * * * * * *

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

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

U.S. market characteristics

LPTs are components used in high voltage electrical power transmission systems to increase, transfer, or decrease the output voltages transmitted over power lines. These pieces of capital equipment typically cost millions of dollars and have a 15- to 40-year lifespan. The U.S. market for LPTs is characterized by the substantial investment required for each unit, and each LPT is custom-built to meet the customer's specifications based on the intended application. The production of LPTs require design, material procurement, manufacturing, testing, disassembly for delivery and installation, site testing requiring specialized workers with 10-15 years of experience and long production cycle of a year or more.[1] Purchasers request quotes from suppliers incorporating precise specifications. These are highly detailed documents requiring extensive preparation, and LPT producers invest a substantial amount of time reviewing the specifications, costing out the elements of design, and putting together a formal bid.[2]

The main purchasers of LPTs are electric utilities, including investor-owned utilities (IOUs), privately owned utilities (POUs), electrical cooperatives, and federally owned utilities. Other purchasers include electric, procurement, and construction companies ("EPCs"). IOUs account for the largest share of the U.S. LPT market.

Some of the large IOUs have non-binding long-term alliance agreements with specific suppliers. These may be referred to as blanket agreements, alliance agreements, or framework agreements. Alliance agreements "ease the procurement process for duplicative orders of a similar transformer." Such agreements may include one to four suppliers. Typically, the LPT manufacturer will reserve space in their factory for their alliance agreement customers and provide a guaranteed lead time. The committed volume baseload allows the manufacturer to

[1] Hearing transcript, p. 15 (Wolken), p. 176 (Colarusso and Ebbert).

[2] Open bids are more common with public utilities, while closed bidding is more common with private utilities and federally owned utilities. *Large Power Transformers from Korea, Inv. No. 731-TA-1189 (Review)*, USITC Publication 4826, August 2018, p. II-1.

U.S. producers stated that utilities require bid proposals to include almost a full design, including a loss evaluation based on the utility's detailed specifications (which can range from 2 to 300 pages), and that it can take 3 weeks to put together a proposal. *Large Power Transformers from Korea, Inv. No. 731-TA-1189 (Review)*, USITC Publication 4826, August 2018, p. II-1.

forecast its plant manning strategies for a period of time.[3] Such alliance agreements typically last two to five years. Both U.S. producers and foreign producers participate in such agreements. The benefit for the utility is that once it buys one LPT with a specific design from a supplier, additional LPTs can be produced and shipped more rapidly. An advantage for suppliers is that they may have an increased chance of successful bidding over the duration of an agreement. Alliance agreements have been increasingly awarded to more than one supplier.[4]

Apparent U.S. consumption increased by 19.8 percent from 2021 to 2022 and decreased by 1.1 percent in from 2022 to 2023. Overall, apparent U.S. consumption in 2023 was 18.5 percent higher than in 2021.

Channels of distribution

Most LPTs are sold to electric utilities (table II-1). Over two-thirds of U.S. producers' sales were made to utilities during 2021-23. Two U.S. producers also reported sales to other end users. Specifically, U.S. producer *** reported sales to industrial or commercial direct customers, and U.S. producer *** reported sales to datacenters and renewable energy producers. Imports from South Korea were shipped primarily to distributors and utilities, with the share going to distributors decreasing from 2021 to 2023. ***. Importer *** reported sales to independent power producers. A majority, of imports from nonsubject countries were sold to utilities, followed by engineering/construction companies.

[3] *Large Power Transformers from Korea, Inv. No. 731-TA-1189 (Review)*, USITC Publication 4826, August 2018, p. II-1.

[4] *Large Power Transformers from Korea, Inv. No. 731-TA-1189 (Review)*, USITC Publication 4826, August 2018, p. II-2.

Table II-1
LPTs: Share of U.S. shipments by source, channel of distribution, and period

Shares in percent

Source	Channel	2021	2022	2023
United States	Distributors	8.5	9.3	18.5
United States	Utilities	79.4	76.5	67.6
United States	Engineering/construction	6.4	10.9	9.5
United States	Other end users	5.7	3.3	4.4
South Korea	Distributors	***	***	***
South Korea	Utilities	***	***	***
South Korea	Engineering/construction	***	***	***
South Korea	Other end users	***	***	***
Nonsubject	Distributors	***	***	***
Nonsubject	Utilities	***	***	***
Nonsubject	Engineering/construction	***	***	***
Nonsubject	Other end users	***	***	***
All imports	Distributors	8.1	5.0	7.1
All imports	Utilities	59.6	60.8	57.4
All imports	Engineering/construction	31.5	34.0	34.4
All imports	Other end users	0.8	0.2	1.0

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Geographic distribution

U.S. producers and importers of South Korean product reported selling LPTs to all regions in the contiguous United States (table II-2). For U.S. producers, 8.9 percent of sales were within 100 miles of their production facility, 73.8 percent were between 101 and 1,000 miles, and 17.2 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
LPTs: Count of U.S. producers' and U.S. importers' geographic markets

Number of firms reporting

Region	U.S. producers	South Korea
Northeast	8	3
Midwest	8	4
Southeast	9	3
Central Southwest	8	4
Mountains	8	3
Pacific Coast	8	3
Other	1	0
All regions (except Other)	8	3
Reporting firms	9	4

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

Note: Other U.S. markets include AK, HI, PR, and VI.

Supply and demand considerations

U.S. supply

Table II-3 provides a summary of the supply factors regarding LPTs from U.S. producers and producers in South Korea. From 2021 to 2023, capacity in the United States increased, as did capacity in South Korea. As can be seen in the table, South Korean capacity exceeded the capacity of U.S. producers in 2021 and 2023. In addition, South Korean producers shipped the majority of their LPTs to export markets whereas U.S. producers sold *** of their LPTs to their home market.[5] A *** of U.S. producers and *** responding foreign producers reported that they were able to shift production of LPTs to other products.

[5] U.S. producer *** reported exporting a miniscule amount of LPTs to *** in ***.

Table II-3
LPTs: Supply factors that affect the ability to increase shipments to the U.S. market, by country

Quantity in MVA top rated; ratios in percent

Factor	Measure	United States	South Korea
Capacity 2021	Quantity	58,870	84,306
Capacity 2023	Quantity	66,174	90,858
Capacity utilization 2021	Ratio	84.5	66.1
Capacity utilization 2023	Ratio	77.7	88.7
Inventories to total shipments 2021	Ratio	***	***
Inventories to total shipments 2023	Ratio	***	***
Home market shipments 2023	Ratio	***	***
Non-US export market shipments 2023	Ratio	***	***
Ability to shift production	Count	***	***

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

Note: Responding U.S. producers accounted for the vast majority of U.S. production of LPTs in 2023. Responding foreign producer/exporter firms accounted for virtually all of U.S. imports of LPTs from South Korea during 2023. 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."

Domestic production

Based on available information, U.S. producers of LPTs have the ability to respond to changes in demand with at least moderate changes in the quantity of shipments of U.S.-produced LPTs to the U.S. market. The main contributing factors to this degree of responsiveness of supply are some availability of unused capacity 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, limited inventories, and the uncertainty of slot reservations.[6] [7]

From 2021 to 2023, U.S. production capacity increased while capacity utilization decreased. Exports accounted for a very small share of U.S. producer shipments ***.[8] Some U.S. firms involved in LPT production, such as U.S.

[6] Given the customer-specific design and engineering specifications for LPTs, producers do not normally hold inventories. *Large Power Transformers from Korea, Inv. No. 731-TA-1189 (Review)*, USITC Publication 4826, August 2018, page II-5.

[7] Purchasers of LPTs will reserve production slots to secure future availability of LPTs. However, the payment of slot fees to producers for this purpose are modest and the reservations are not binding so they may not translate into actual orders. Domestic producers' prehearing brief, pp. 16-17.

[8] U.S. producer *** reported exports of LPTs to ***. U.S. producers reported that export constraints include limited experience exporting LPTs and the existence of tariff and nontariff measures in other

(*continued*...)

producers Hyosung HICO and HD HPT USA, have South Korean parent companies, and are related to firms that operate outside the United States.

Subject imports from South Korea

Based on available information, South Korean producers have the ability to respond to changes in demand with at least moderate changes in the quantity of shipments of LPTs to the U.S. market. The main contributing factors to this degree of responsiveness of supply are the availability of unused capacity and ability to shift shipments from alternate markets. Factors mitigating responsiveness of supply include limited inventories and the ability to fill customer base slots demand.

Two U.S. producers, HD HPT USA and Hyosung HICO, have LPT production facilities in the United States and are affiliates of the South Korean producers HD Hyundai Electric and Hyosung Heavy Industries. Together they are the *** and *** largest U.S. producers of LPTs.[9] South Korean producers' capacity increased from 2021 to 2023, as did their production. Additionally, their share of shipments to the South Korean home market declined from 2021 to 2023 by approximately *** percentage points. South Korean producers reported exporting LPTs to a variety of markets including Algeria, Australia, Bahrain, Bangladesh, Cambodia, Chile, France, Indonesia, Japan, Jordan, Kuwait, Malaysia, Mexico, Myanmar, New Zealand, Norway, Oman, Poland, Qatar, Romania, Saudi Arabia, Singapore, Thailand, Trinidad and Tobago, UAE (United Arab Emirates), United Kingdom, and Vietnam.

Foreign producers reported that it would be difficult to shift sales between the U.S. market and other markets. Foreign producer *** explained that shifting between markets depends on its ability to meet each customer's specific needs for LPTs, which are complex, custom-made products. *** stated that shifting between markets would take considerable time and effort because of the customized nature of LPTs which requires costly and time-consuming pre-qualification by customers.

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countries. U.S. producer *** report that industry standards for export markets outside of the United States tend to differ from those within the United States, which may pose challenges in adjusting their production to meet these different standards. *** states that its current sales structure and organization would render it unable to shift sales to other U.S. markets. Furthermore, it reported that selling outside the U.S. market would necessitate significant investment, which may not generate the needed revenue to justify the expense. U.S. producer *** reported that it is not able to shift sales of large power transformers to alternative markets mainly due to its lack of sales connections and infrastructure needed to operate successfully in foreign markets beyond Canada. U.S. producer *** reported that, while exporting internationally is possible, the price would not be competitive given the transportation expenses involved.

[9] Joint Respondents Prehearing Brief, p. 18.

Two of the three reporting South Korean producers reported that the product range, product mix, or marketing is different in the South Korean home market than in export markets. Foreign producers *** stated that their sales representatives directly contact the customer and perform marketing and promotion activities in South Korea but in export markets, independent sales agents provide marketing intelligence.

South Korean producers reported several changes in factors affecting supply since 2018, such as energy prices and company-specific factors. *** reported that the availability ***. Meanwhile, *** reports that its availability of supply may have been impacted by a reduction in skilled workers.

Imports from nonsubject sources

Nonsubject imports accounted for *** percent of total U.S. imports in 2023. The seven largest sources of nonsubject imports during 2021-23 were Mexico, Netherlands, Brazil, Croatia, China, Poland, and Canada. Combined, these countries accounted for *** percent of nonsubject imports in 2023.[10]

Supply constraints

Most responding firms (6 of 9 U.S. producers, 5 of 11 importers, and 14 of 17 purchasers) reported that they had experienced supply constraints since January 1, 2018. U.S. Producers *** stated that they have limited capacity and were unable to take on new customers to expand their market share. U.S. producer *** reported delayed delivery due to supply chain issues. Additionally, U.S. producer *** stated that it has declined orders and new customers due to limited production slots, design capacity, and workforce shortages. U.S. producer *** reported that it has struggled with fulfilling orders with existing customers over the past two years, leading it to abstain from bidding for projects with new clients.

Importers *** reported that they are frequently forced to decline or refuse new orders due to escalating demand, restricted production capacity, and a scarcity of qualified workers. Importer *** cited supply chain disruptions causing supply constraints, while importer *** stated that it has struggled with managing orders from

[10] See Part IV for more details.

their current existing customers in the past two years, leading it to miss out on numerous bidding opportunities from potential new customers.

Purchasers *** reported that suppliers struggle to meet the requirements for high-voltage power transformers or fulfill delivery dates. Purchaser *** noted that Siemens Austria and Hitachi Sweden's capacity for EHV transformers is tied up by projects outside the United States, leaving little availability for U.S. projects. *** reported lengthy delivery times, and some vendors have declined to bid. Additionally, purchaser *** stated that U.S. suppliers cited increased demand outpacing production capacity as a reason for not accepting orders and delays in component materials. Purchaser *** added that manufacturers have declined RFP opportunities due to the inability to meet required delivery dates or have submitted proposals but cannot adhere to them. At the same time, purchaser *** also observed a trend where manufacturers prioritize larger orders over smaller ones.

New suppliers

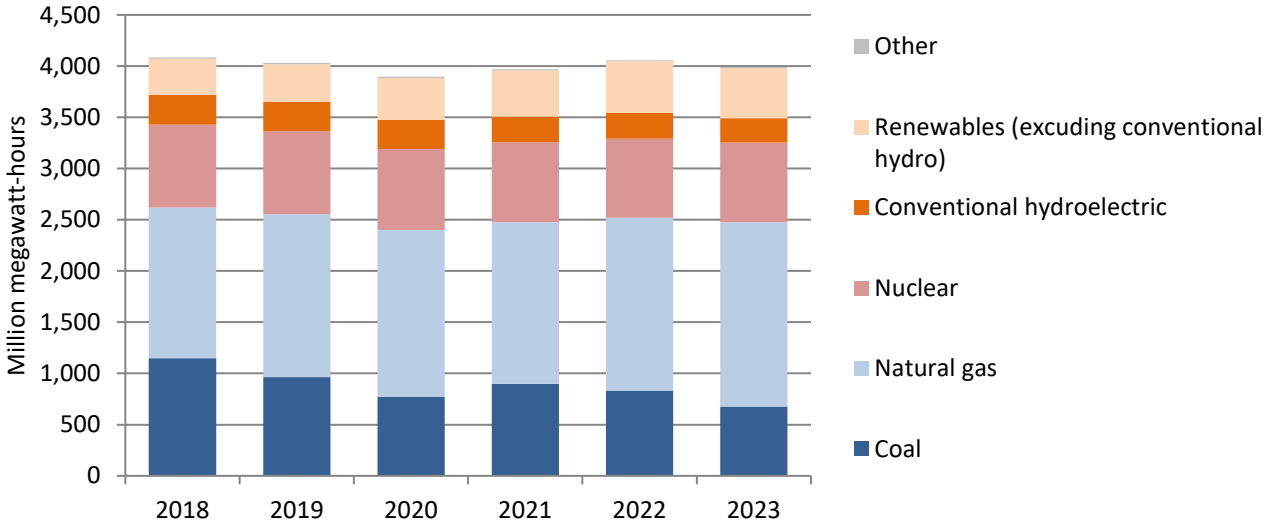
Four of 17 purchasers reported that new suppliers have entered the U.S. market since January 1, 2018, and seven expect additional entrants. Purchasers cited HICO America (Memphis, Tennessee) as a new supplier, with purchaser *** adding that HICO America acquired MEPPI's manufacturing plant in 2019 and started manufacturing transformers in 2020. Purchasers also reported that Siemens would become a new supplier after it announced an expansion with a new facility in North Carolina. Purchaser *** anticipates new suppliers to address the increased demand.

U.S. demand

Based on available information, the overall demand for LPTs is likely to experience small changes in response to changes in price. The main contributing factors are the lack of substitute products and the small cost share of LPTs in its end-use products.

Annual total net electricity generation at utility scale facilities have fluctuated from 2018 to 2023 with the net electricity generation declining from 2018 to 2020, increasing from 2020 to 2022 and declining slightly in 2023 (figure II-1 and table II-4).

Figure II-1
Total net electricity generation at utility scale facilities, by sector, 2018-23



Source: U.S. Department of Energy, Energy Information Administration, "Electric Power Monthly, Data for April 2024," May 15, 2024, https://www.eia.gov/electricity/monthly/.

Table II-4
Total net electricity generation at utility scale facilities, by sector, 2018-23

Thousand megawatt-hours

Energy source	2018	2019	2020	2021	2022	2023
Coal	1,149,487	964,957	773,393	897,999	831,512	675,264
Natural gas	1,471,843	1,588,533	1,626,790	1,579,190	1,687,067	1,802,062
Nuclear	807,084	809,409	789,879	779,645	771,537	775,347
Conventional hydroelectric	292,524	287,874	285,274	251,585	254,789	239,855
Renewables	350,467	368,862	408,539	448,424	502,231	489,161
Other	12,973	13,331	12,855	12,140	11,114	9,955
Net generation	4,047,765	4,065,964	4,093,606	4,077,601	4,076,675	4,014,804

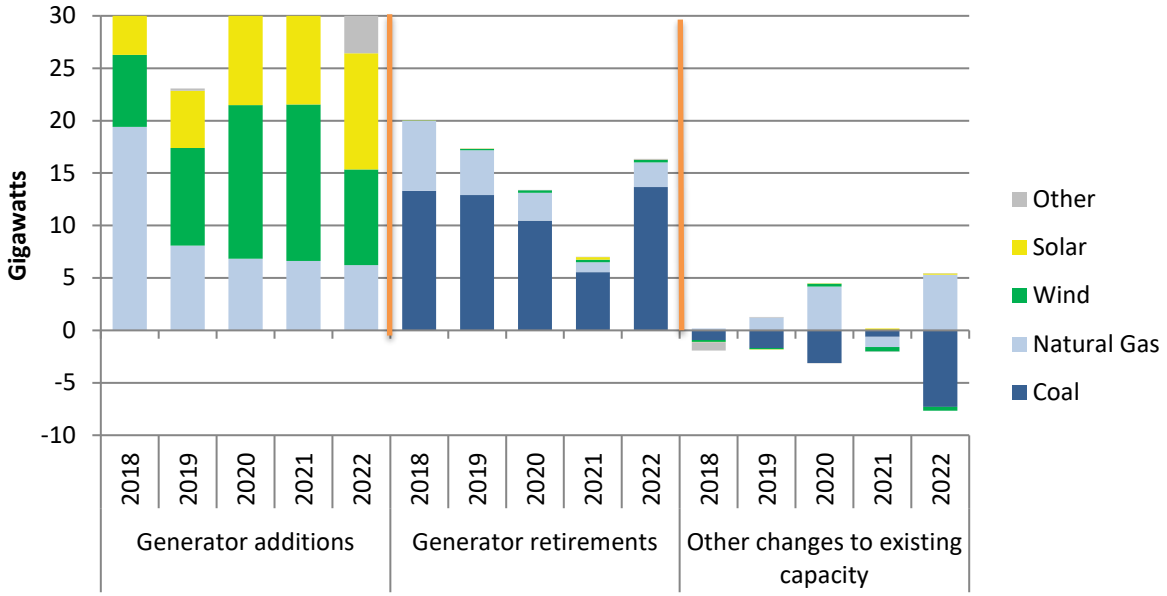
Source: U.S. Department of Energy, Energy Information Administration, "Electric Power Monthly, Data for April 2024," May 15, 2024, https://www.eia.gov/electricity/monthly/.

Note: Renewables excludes conventional hydroelectric power.

LPT demand is driven by the need to replace aging infrastructure, and by the construction of new generation facilities and transmission lines. New utility-scale power plant additions varied during each year from 2018 to 2022. They declined from 31.3 GW in 2018 to 23.1 GW in 2019, increased to 32.4 GW in 2020 and 38.2 GW in 2021, and then decreased to 30.5 GW in 2022 (figure II-2 and table II-5). The largest increases in newly installed electricity generation during this period came from new solar (approximately 45.1 GW over the five years), natural gas (approximately 47.1 GW over the five years), and wind (approximately 54.9 GW over the five years) generation capacity. Investment in transmission by investor-owned

utilities increased from $22.2 billion in 2018 to $26.7 billion in 2022 and was projected to total $29.1 billion in 2023 (figure II-3 and table II-6).

Figure II-2
U.S. utility-scale net summer capacity additions, retirements, and changes, by energy source, 2018-22



Source: EIA, Electric Power Annual 2018-22, Table 4.6, https://www.eia.gov/electricity/annual/ (accessed May 22, 2024).

Note: Annual data are currently only available up to 2022.

Note: Other changes to existing capacity "reflect uprates, derates, repowering, and changes to previously reported generator capacity."

Table II-5
Electric generating capacity additions, retirements, and changes, by energy source

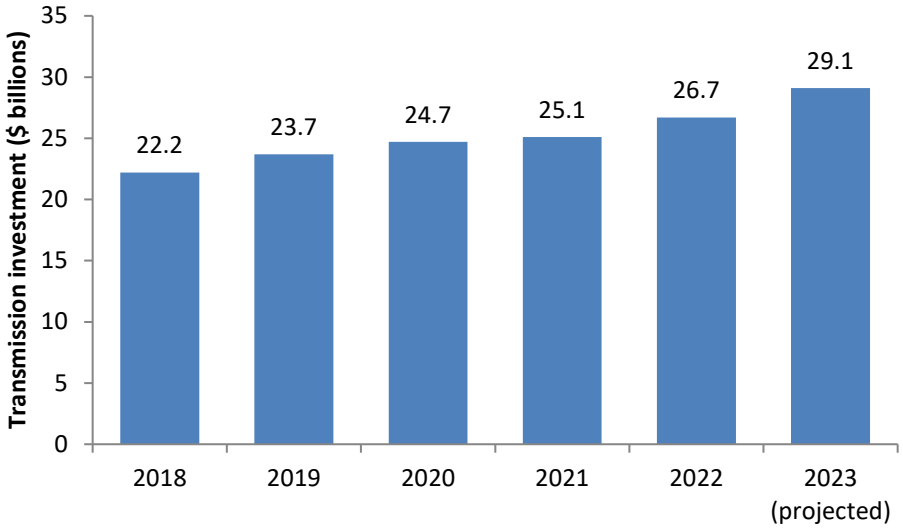
Thousand megawatt-hours

Energy source	Measure	2018	2019	2020	2021	2022
Coal	Generator additions	--	--	17	--	--
Natural Gas	Generator additions	19,400	8,075	6,368	6,613	6,210
Wind	Generator additions	6,874	9,315	14,665	14,931	9,155
Solar	Generator additions	4,810	5,479	10,411	13,418	11,053
Other	Generator additions	220	193	489	3,253	4,110
Coal	Generator retirements	13,304	12,895	10,457	5,562	13,680
Natural Gas	Generator retirements	6,678	4,292	2,651	934	2,351
Wind	Generator retirements	4	131	246	234	235
Solar	Generator retirements	1	8	--	270	4
Other	Generator retirements	6	30	4	12	86
Coal	Other changes to existing capacity	(912)	(1,688)	(3,118)	(621)	(7,284)
Natural Gas	Other changes to existing capacity	180	1,213	4,177	(962)	5,322
Wind	Other changes to existing capacity	(149)	(129)	290	(421)	(370)
Solar	Other changes to existing capacity	(43)	(26)	31	193	108
Other	Other changes to existing capacity	(784)	66	(42)	(40)	41

Source: EIA, Electric Power Annual 2018–22, Table 4.6, https://www.eia.gov/electricity/annual/; EIA, Electric Power Monthly, Tables 6.3 and 6.4, February 2024, https://www.eia.gov/electricity/monthly/.

Note: Other changes to existing capacity "reflect uprates, derates, repowerings, and changes to previously reported generator capacity." Data on changes to existing capacity for 2017 are not available.

Figure II-3
Investment in transmission by investor-owned utilities, 2018-22 and projected 2023



Source: Edison Electric Institute website, Transmission and Distribution, https://www.eei.org/en/resources-and-media/industry-data (accessed May 15, 2024).

Table II-6
Investment in transmission by investor-owned utilities, 2018-22 and projected 2023

Billions of dollars

Year	Schedule	Transmission investment
2018	Actual	22.2
2019	Actual	23.7
2020	Actual	24.7
2021	Actual	25.1
2022	Actual	26.7
2023	Projected	29.1
2024	Projected	29.6
2025	Projected	30.3
2026	Projected	32.1

Source: Edison Electric Institute website, Transmission and Distribution, https://www.eei.org/en/resources-and-media/industry-data (accessed May 15, 2024).

End uses and cost share

The end use for LPTs is electricity generation and distribution. Most firms (8 of 9 U.S. producers, 11 of 12 importers, and 14 of 17 purchasers) reported no changes in end uses from 2018 to 2020. Most firms (7 of 9 U.S. producers, 9 of 12 importers, and 14 of 17 purchasers) also reported no changes in end uses from 2021 to 2023. Most firms (6 of 9 U.S. producers, 7 of 12 importers, and 14 of 17 purchasers) also anticipate no changes in end uses. U.S. producers ***, along with importer *** and purchaser ***, reported anticipating a trend to use large power transformers for a wider variety of applications, namely for use by data centers. Importer *** also reported anticipating heightened future end-use for LPTs in industrial plant applications with a sharp increase in AI data centers. Purchaser *** predicted an increase in renewables, especially wind and solar usage.

LPTs account for a small-to-moderate share of the cost of substations and a small share of the total cost of electricity generation and distribution. Purchasers' reported cost shares for substations and wind farms were as follows:

- Distribution substations: 7.9-30 percent
- Generating facility substations: 40-60 percent
- Transmission line substations: 3-30 percent
- Wind farms: 1-10 percent

Other reported cost-share end uses were solar and energy storage facilities. Purchaser *** reported that the cost of LPTs represents *** percent of the total cost of producing

energy at solar facilities, and purchaser *** reported that the cost of LPTs represents *** percent of the total cost for energy storage facilities.

Business cycles

Four of 9 U.S. producers, 6 of 12 importers, and 8 of 15 responding purchasers indicated that the market was subject to business cycles distinct to the U.S. LPT market. Specifically, producer and importer *** stated that business cycles occur with capital spend programs from utilities that are driven by infrastructure growth and asset renewal programs which vary from year to year, with producer and importer *** adding that these massive investment in generation and transmission cycles causing periodic booms in demand. Importer *** reported that long-term business cycles and trends are based on replacement demand, the expansion of power grids, and the mix of power generation sources.

Purchaser responses focused more on cycles within a year. *** reported that LPT business cycles generally follow higher purchase volume at the end of the year and higher construction purchases around mid-year. Purchaser *** reported significant pushes to get transformers purchased before the end of the year with the passage of the Inflation Reduction Act (IRA); this has pushed the need for increased purchase volume in the first quarter with expected delivery of transformers around the summer months.

Two of 9 U.S. producers, 7 of 12 importers, and 4 of 14 responding purchasers indicated that the LPT market was subject to distinctive conditions of competition. Specifically, U.S. producer *** reported that while a growing market benefits most suppliers, tight supplies limit the number of suppliers capable of producing custom products with flexible designs. This makes it challenging to find a supplier that can guarantee quality and timely delivery during peak demand periods. U.S. producer *** observed that both domestic producers and importers struggle to meet the rising demand driven by renewable energy and data center investments, resulting in suppliers prioritizing fulfilling existing obligations rather than winning new bids. Importers *** asserted that suppliers must have the capability to produce customized products with flexible designs while ensuring quality and timely delivery, particularly during market upswings. Additionally, importer *** emphasized that each supplier has established long-term relationships with existing U.S. customers, making it essential for them to prioritize fulfilling obligations rather than competing for new customer bids.

Among purchasers, purchaser *** stated that raw material and component sourcing, labor availability, and expertise are conditions of competition factors. Purchaser *** emphasized the importance of production capacity for competitive

advantage, while purchaser *** highlighted R&D, technology, and manufacturing capabilities as key competition factors for LPTs. They also noted that only a few manufacturers have the capabilities to produce a full range of LPT ratings, especially larger high-voltage units.

Demand trends

Most firms reported that U.S. demand for LPTs fluctuated upwards or did not change from January 2018 to December 2020. Most firms reported that U.S. demand for LPTs fluctuated up or steadily increased from 2021 to 2023 (table II-7). Most firms expect U.S. demand for LPTs to steadily increase, not change, or fluctuate upward over the next two years; only one firm reported that it expects demand to decrease (table II-8).

Table II-7
LPTs: Count of firms' responses regarding overall domestic and foreign demand since January 1, 2018, by firm type

Number of firms reporting

Market	Firm type	Steadily increase	Fluctuate up	No change	Fluctuate down	Steadily decrease
U.S. demand: 2018 to 2020	U.S. producers	1	3	4	0	1
U.S. demand: 2018 to 2020	Importers	2	6	3	0	0
U.S. demand: 2018 to 2020	Purchasers	4	3	8	0	0
U.S. demand: 2018 to 2020	Foreign producers	1	1	1	0	0
U.S. demand: 2021 to 2023	U.S. producers	3	4	1	0	1
U.S. demand: 2021 to 2023	Importers	8	3	0	0	1
U.S. demand: 2021 to 2023	Purchasers	13	3	0	0	0
U.S. demand: 2021 to 2023	Foreign producers	3	0	0	0	0
Foreign demand: 2018 to 2020	U.S. producers	0	2	4	0	0
Foreign demand: 2018 to 2020	Importers	1	4	4	0	0
Foreign demand: 2018 to 2020	Purchasers	3	2	6	0	0
Demand in subject home market: 2018 to 2020	Foreign producers	1	0	1	1	0
Demand in other export markets: 2018 to 2020	Foreign producers	1	1	1	0	0
Foreign demand: 2021 to 2023	U.S. producers	2	1	3	0	0
Foreign demand: 2021 to 2023	Importers	6	1	3	0	0
Foreign demand: 2021 to 2023	Purchasers	8	3	1	0	0
Demand in subject home market: 2021 to 2023	Foreign producers	2	0	0	1	0
Demand in other export markets: 2021 to 2023	Foreign producers	3	0	0	0	0
Demand for end use products	Purchasers	7	5	2	1	0

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

Table II-8
LPTs: Count of firms' responses regarding anticipated overall domestic and foreign demand, by firm type

Number of firms reporting

Market	Firm type	Steadily increase	Fluctuate up	No change	Fluctuate down	Steadily decrease
U.S. demand	U.S. producers	6	1	1	0	1
U.S. demand	Importers	10	2	0	0	0
U.S. demand	Purchasers	12	4	0	0	0
U.S. demand	Foreign producers	3	0	0	0	0
Foreign demand	U.S. producers	3	0	3	0	0
Foreign demand	Importers	7	0	3	0	0
Foreign demand	Purchasers	9	3	1	0	0
Demand in subject home market	Foreign producers	2	1	0	0	0
Demand in other export markets	Foreign producers	3	0	0	0	0

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

The demand for LPTs has substantially increased due to various contributing factors. These include the surge in the development of renewable energy sources, which has led to a higher demand for LPTs. Importer *** reported that the clean energy market and transmission and distribution projects have driven demand higher since January 2021. Additionally, an increase in energy demand due to the growth of data centers has also contributed to the increased demand for LPTs, as highlighted by importers ***. Producers *** reported that there has been a significant rise in power consumption reflective of the gradual growth in overall power needs, which in turn has driven up the demand for LPTs.

The transition from fossil fuel towards renewable energy generation has contributed to the increased demand for LPTs as the LPTs act as a collecting piece of infrastructure within the system that allows the generation of clean energy and the transmission system to interconnect.[11] U.S. producer and importer *** specifically reported increased market demand due to the IRA, net-zero transition, and transmission projects leading to increased LPTs. Companies have also reported an increase in demand due to strategic customer planning as reported by ***, grid expansion and clean energy initiatives reported by ***, and general market demand (as reported by ***). Foreign producer *** reported that outside the United

[11] Hearing transcript, pp. 68-69 (Wolken).

States, LPT demand has also increased due to increased European market demand for offshore wind and renewable-related projects along with the Middle East market (Saudi Arabia, more specifically) increased demand for LPTs due to new construction of megacities.

Regarding anticipated changes in the demand for LPTs, U.S. producer *** expect that the demand trend will continue to grow in the future. This is largely based on the ongoing growth in renewable energy projects, the increasing size of data centers, and the ever-increasing demand for electricity.

Substitute products

All U.S. producers, importers, and purchasers reported that there were no substitutes and did not anticipate any future changes in substitutes.

Substitutability issues

This section assesses the degree to which U.S.-produced LPTs and imports of LPTs from subject countries can be substituted for one another by examining the importance of certain purchasing factors and the comparability of LPTs from domestic and imported sources based on those factors. Based on available data, staff believes that there is a moderate-to-high degree of substitutability between domestically produced LPTs and LPTs imported from South Korea.[12] Factors contributing to this level of substitutability include similar quality and availability of LPTs, as well as interchangeability between domestic sources and South Korea. However, factors reducing substitutability include reported differences in interchangeability and lead times between LPTs from domestic sources and South Korea, as well as important non-price factors that firms consider. Staff does not believe the made-to-order nature of the industry has a negative impact on substitutability because manufacturers are set up to produce a variety of specifications and a majority of purchasers have not indicated constraints on buying their specifications from the different sources.

[12] The degree of substitution between domestic and imported LPTs depends upon the extent of product differentiation between the domestic and imported products and reflects how easily purchasers can switch from domestically produced LPTs to the LPTs imported from subject countries (or vice versa) when prices change. The degree of substitution may include such factors as relative prices (discounts/rebates), quality differences (e.g., grade standards, defect rates, etc.), and differences in sales conditions (e.g., lead times between order and delivery dates, reliability of supply, product services, etc.).

Factors affecting purchasing decisions[13]

Purchaser decisions based on source

As shown in table II-9, most purchasers always, usually, and sometimes make their purchasing decisions based on the producer or country of origin. Whereas most customers sometimes or never make purchasing decisions based on the producer or country of origin. Of the four purchasers that reported that they always make decisions based on the manufacturer, two firms cited the need for manufacturer qualification, and the other two purchasers cited cost, quality, and/or lead time requirements.

Table II-9
LPTs: Count of purchasers' responses regarding frequency of purchasing decisions based on producer and country of origin

Number of firms reporting

Firm making decision	Decision based on	Always	Usually	Sometimes	Never
Purchaser	Producer	4	6	4	4
Customer	Producer	0	0	2	5
Purchaser	Country	2	2	8	5
Customer	Country	0	0	2	5

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

Importance of purchasing domestic product

Fifteen of 17 reporting purchasers reported that most or all of their purchases did not require purchasing U.S.-produced products. One purchaser reported that domestic products were required by law, and one purchaser reported other preferences for domestic products. The reason cited for preferring domestic products was that domestic producers met their standard LPT designs. No purchasers reported that domestic products were required by their customers.

Most important purchase factors

The most often cited top three factors firms consider in their purchasing decisions for LPTs were price or cost (15 firms), lead time/delivery (12 firms), quality (9 firms), and project, design, or technical specifications (5 firms), as shown in table II-10. Quality was the most frequently cited first-most important factor (cited by 5 firms), followed by price or cost and

[13] Fourteen purchasers indicated they had pricing knowledge of domestic product, six of South Korean product, and 11 of product from nonsubject countries.

project, design, or technical (4 firms each); price or cost was the second-most important factor (5 firms); and price or cost and lead time, schedule, or delivery was the most frequently reported third-most important factor (6 firms each).

Table II-10
LPTs: Count of ranking of factors used in purchasing decisions as reported by purchasers, by factor

Number of firms reporting

Firm making decision	First	Second	Third	Total
Price or cost	4	5	6	15
Lead time, schedule, or delivery	2	4	6	12
Quality	5	3	1	9
Project, design, or technical	4	1	1	5
Availability or supply	0	2	1	3
All other factors	2	2	2	NA

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

Note: Other factors include technical expertise, business relationship, commercial evaluation, supplier location, and supplier experience.

Eight of 17 purchasers reported that they usually purchase the lowest-priced product with seven purchasers reporting that they sometimes purchase the lowest-priced LPTs. Two purchasers reported never purchasing the lowest priced LPTs, and no purchasers reported always purchasing the lowest priced LPTs.[14]

Importance of specified purchase factors

Purchasers were asked to rate the importance of 25 factors in their purchasing decisions (table II-11). The factors rated as very important by more than half of responding purchasers were delivery time and reliability of supply (16 firms each); quality meets industry standards (15 firms); availability (14 firms); long-term relationship, product consistency, quality exceeds industry standards, and responsiveness of supplier (13 firms each); price (12 firms); warranties and technical support/service (11 firms each); delivery terms and time to fill order (10 firms each); and ease of doing business (9 firms).

[14] Purchasers *** reported never purchasing the lowest priced LPTs.

Table II-11
LPTs: Count of purchasers' responses regarding importance of purchase factors, by factor

Number of firms reporting

Factor	Very important	Somewhat important	Not important
Delivery time	16	1	0
Reliability of supply	16	1	0
Quality meets industry standards	15	2	0
Availability	14	2	0
Long-term relationship	13	4	0
Product consistency	13	4	0
Quality exceeds industry standards	13	4	0
Responsiveness of supplier	13	4	0
Price	12	5	0
Warranties	11	6	0
Technical support/service	11	4	1
Delivery terms	10	7	0
Time to fill order	10	7	0
Ease of doing business	9	8	0
Evaluated or lifetime cost	7	10	0
Shell or core design	7	8	3
Country of origin	4	12	1
Energy loss	4	12	1
U.S. transportation costs	4	9	4
Discounts offered	2	9	6
Availability of greater than 499 MVA top rated products	2	8	7
Minimum quantity requirements	2	5	11
Product range	1	12	4
Packaging	1	10	6
Extension of credit	1	7	9

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

Lead times

For 2023, U.S. producers reported that 100 percent of their commercial shipments were produced-to-order, with lead times averaging approximately 3.0 years. For 2023, U.S. importers reported that 100 percent of their commercial shipments were produced-to-order, with lead times averaging approximately 1.5 years.

Supplier certification

Fourteen of 16 responding purchasers require their suppliers to become certified or qualified to sell LPTs to their firm. Purchasers reported that the time to qualify a new supplier

ranged from 45 to 180 days. Three purchasers reported that a domestic or foreign supplier had failed in its attempt to qualify LPTs or had lost its approved status since 2018.

Minimum quality specifications

As can be seen from table II-12, five responding purchasers reported that domestically produced product always met minimum quality specifications. Four responding purchasers reported that the South Korea LPTs always met minimum quality specifications.

Table II-12
LPTs: Count of purchasers' responses regarding suppliers' ability to meet minimum quality specifications, by source

Number of firms reporting

Source of purchases	Always	Usually	Sometimes	Rarely or never	Don't know
United States	5	8	2	0	2
South Korea	4	4	0	0	9
Nonsubject sources	5	7	1	0	1

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

Note: Purchasers were asked how often domestically produced or imported LPTs meets minimum quality specifications for their own or their customers' uses.

Responding purchasers reported factors that determined quality include: design robustness, employee training, engineers' experience, environmental impact, industry standards, maintenance needs, manufacturing inspections, performance, research and design test data, safety standards, staff knowledge, supplier performance, use of quality materials, and workmanship.

Changes in purchasing patterns

Eight purchasers reported that they had changed suppliers since January 1, 2018, while nine reported that they had not. Specifically, firms dropped or reduced purchases among firms driven mainly by factors such as operational efficiency, supply chain management, and strategic sourcing. Purchaser *** stated that it dropped MEPPI when the plant ceased operations and also dropped Siemens when its lead time was deemed to be uncompetitive. To optimize its supply chain and meet demand, it added HD HPT USA. *** stated that in response to future needs, it approved a new factory in Canada in 2023 and plan to add a domestic factory in 2024. *** stated that in response to increases in demand, they approved new suppliers, including Royal SMIT, HICO America, HD HPT USA, KPT, and Georgia Transformer Company. *** also added several suppliers to meet its varying demands, including ILJIN to cater to its various power supplier needs, SGB for their small to

medium power supplier needs, and Hyosung HICO's new Memphis, TN factory to its approved supplier list. *** decided to drop Mitsubishi's Tennessee and Japanese factories as they were not meeting its specification requirements. *** added Hyosung HICO to meet increased demands and assess domestic plant capabilities. It plans to add HD HPT USA in 2024 to address increased demand and assess another domestic plant's capabilities. Purchaser *** stated it had used Hyosung HICO and PA Transformer but then added HD HPT USA, SGB, and recently LS Electric. Purchaser *** stated that they recently added Siemens Energy to the list of suppliers due to competitive lead time, cost and quality.

Purchasers were also asked about changes in their purchasing patterns from different countries since January 1, 2018 (table II-13). Purchasers reported increased purchases of U.S.-produced products because of the need to accelerate replacements due to demand increases due to grid investment, decrease in capital projects, high costs, long lead times, project requirements, regional industrial load growth, replacement of aging transformers, and tariffs making certain purchases impractical. Purchasers reported decreased purchases of products from South Korea due to changes in manufacturing location, capacity limitations, and a decrease in capital projects. Purchasers reported increased product purchases from nonsubject countries because of project requirements, increased demand due to grid investment, replacement of aging transformers, economic development success, and increased capital spending.

Table II-13
LPTs: Count of purchasers' responses regarding changes in purchase patterns from U.S., subject, and nonsubject countries

Number of firms reporting

Source of purchases	Steadily increase	Fluctuate up	No change	Fluctuate down	Steadily decrease	Did not purchase
United States	6	5	3	0	1	1
South Korea	1	2	1	0	4	8
Nonsubject sources	4	5	4	1	1	1
Sources unknown	0	0	1	0	0	7

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

Purchase factor comparisons of domestic products, subject imports, and nonsubject imports

Purchasers were asked a number of questions comparing LPTs produced in the United States, subject countries, and nonsubject countries. First, purchasers were asked for a country-

by-country comparison on the same 25 factors (table II-14) for which they were asked to rate the importance.

A majority of purchasers rated domestic products as comparable to products from South Korea on most factors. Domestic products were ranked superior compared to subject sources regarding country of origin, long-term relationship, and U.S. transportation cost. Domestic products were rated inferior concerning availability of greater than 499 MVA top-rated products and time to fill an order.

Most purchasers reported that U.S. and nonsubject LPTs were comparable on most factors except country of origin and U.S. transportation cost (for which domestic LPTs were ranked superior). Domestic products were ranked inferior to nonsubject LPTs on availability of greater than 499 MVA top-rated products and product range.

Table II-14
LPTs: Count of purchasers' responses comparing U.S.-produced and imported product, by factor and country pair

Number of firms reporting

Factor	Country pair	Superior	Comparable	Inferior
Availability	U.S. v. South Korea	0	7	1
Availability of greater than 499 MVA top rated products	U.S. v. South Korea	1	3	4
Country of origin	U.S. v. South Korea	2	3	0
Delivery terms	U.S. v. South Korea	0	7	0
Delivery time	U.S. v. South Korea	2	4	1
Discounts offered	U.S. v. South Korea	0	7	0
Ease of doing business	U.S. v. South Korea	1	6	1
Energy loss	U.S. v. South Korea	0	7	0
Extension of credit	U.S. v. South Korea	0	5	0
Evaluated or lifetime cost	U.S. v. South Korea	0	8	0
Long-term relationship	U.S. v. South Korea	1	6	0
Minimum quantity requirements	U.S. v. South Korea	0	8	0
Packaging	U.S. v. South Korea	0	8	0
Price	U.S. v. South Korea	0	7	0
Product consistency	U.S. v. South Korea	0	7	1
Product range	U.S. v. South Korea	0	6	1
Quality meets industry standards	U.S. v. South Korea	0	7	1
Quality exceeds industry standards	U.S. v. South Korea	0	6	1
Reliability of supply	U.S. v. South Korea	0	7	0
Responsiveness of supplier	U.S. v. South Korea	0	7	1
Shell or core design	U.S. v. South Korea	0	8	0
Technical support/service	U.S. v. South Korea	0	7	1
Time to fill order	U.S. v. South Korea	0	6	2
U.S. transportation costs	U.S. v. South Korea	3	5	0
Warranties	U.S. v. South Korea	0	8	0

Table continued.

Table II-14 Continued
LPTs: Count of purchasers' responses comparing U.S.-produced and imported product, by factor and country pair

Number of firms reporting

Factor	Country pair	Superior	Comparable	Inferior
Availability	U.S. v. Nonsubject	0	10	2
Availability of greater than 499 MVA top rated products	U.S. v. Nonsubject	1	4	6
Country of origin	U.S. v. Nonsubject	3	6	0
Delivery terms	U.S. v. Nonsubject	0	11	0
Delivery time	U.S. v. Nonsubject	3	6	2
Discounts offered	U.S. v. Nonsubject	0	9	0
Ease of doing business	U.S. v. Nonsubject	2	8	2
Energy loss	U.S. v. Nonsubject	0	11	0
Extension of credit	U.S. v. Nonsubject	0	9	0
Evaluated or lifetime cost	U.S. v. Nonsubject	0	11	1
Long-term relationship	U.S. v. Nonsubject	0	11	0
Minimum quantity requirements	U.S. v. Nonsubject	0	12	0
Packaging	U.S. v. Nonsubject	0	12	0
Price	U.S. v. Nonsubject	0	7	4
Product consistency	U.S. v. Nonsubject	0	11	1
Product range	U.S. v. Nonsubject	0	8	3
Quality meets industry standards	U.S. v. Nonsubject	0	11	1
Quality exceeds industry standards	U.S. v. Nonsubject	0	9	2
Reliability of supply	U.S. v. Nonsubject	0	10	1
Responsiveness of supplier	U.S. v. Nonsubject	0	11	1
Shell or core design	U.S. v. Nonsubject	0	10	1
Technical support/service	U.S. v. Nonsubject	0	11	1
Time to fill order	U.S. v. Nonsubject	1	11	0
U.S. transportation costs	U.S. v. Nonsubject	2	10	0
Warranties	U.S. v. Nonsubject	0	12	0

Table continued.

Table II-14 Continued
LPTs: Count of purchasers' responses comparing U.S.-produced and imported product, by factor and country pair

Number of firms reporting

Factor	Country pair	Superior	Comparable	Inferior
Availability	South Korea v. Nonsubject sources	0	5	1
Availability of greater than 499 MVA top rated products	South Korea v. Nonsubject sources	1	6	1
Country of origin	South Korea v. Nonsubject sources	0	5	0
Delivery terms	South Korea v. Nonsubject sources	0	7	0
Delivery time	South Korea v. Nonsubject sources	1	5	1
Discounts offered	South Korea v. Nonsubject sources	0	7	0
Ease of doing business	South Korea v. Nonsubject sources	0	7	1
Energy loss	South Korea v. Nonsubject sources	0	7	0
Extension of credit	South Korea v. Nonsubject sources	0	5	0
Evaluated or lifetime cost	South Korea v. Nonsubject sources	0	7	0
Long-term relationship	South Korea v. Nonsubject sources	0	6	1
Minimum quantity requirements	South Korea v. Nonsubject sources	0	8	0
Packaging	South Korea v. Nonsubject sources	0	8	0
Price	South Korea v. Nonsubject sources	0	6	1
Product consistency	South Korea v. Nonsubject sources	0	7	1
Product range	South Korea v. Nonsubject sources	0	7	0
Quality meets industry standards	South Korea v. Nonsubject sources	0	8	0
Quality exceeds industry standards	South Korea v. Nonsubject sources	0	6	1
Reliability of supply	South Korea v. Nonsubject sources	1	6	0
Responsiveness of supplier	South Korea v. Nonsubject sources	0	7	1
Shell or core design	South Korea v. Nonsubject sources	0	7	1
Technical support/service	South Korea v. Nonsubject sources	0	7	1
Time to fill order	South Korea v. Nonsubject sources	2	6	0
U.S. transportation costs	South Korea v. Nonsubject sources	0	8	0
Warranties	South Korea v. Nonsubject sources	0	8	0

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

Note: With respect to cost/price factors, a rating of superior means that price/cost for the first source in the country pair is generally lower. For example, if a firm reported "U.S. superior," it meant that the U.S. product was generally priced lower than the imported product.

Comparison of U.S.-produced and imported LPTs

In order to determine whether U.S.-produced LPTs can generally be used in the same applications as imports from South Korea; U.S. producers, importers, and purchasers were asked whether the products can always, frequently, sometimes, or never be used interchangeably. As shown in tables II-15 to II-17, most U.S. producers reported that LPTs from all sources were always interchangeable. Among importers, more than half of responding firms

reported that LPTs from all sources were sometimes or never interchangeable, and the rest reported that they were always interchangeable. Most purchasers reported that LPTs from all sources were always or frequently interchangeable, with 8 of 10 firms reporting that U.S. and South Korean LPTs were always or frequently interchangeable, and two reporting that they were sometimes interchangeable.

Domestic producers *** reported that LPTs are custom-made and sometimes or never interchangeable due to unique designs and specific customer specifications. *** also noted that industry standards vary by country. Importers *** report that LPTs are generally not interchangeable due to their unique, custom-made designs. Importer *** stated that specific design requirements that may not be produced by suppliers in certain countries, such as shell form transformers, UHV or EHV transformers, including 500kV, 765kV units, and large capacity units exceeding 300 MVA. Importers *** reported that because each large power transformer is custom-made with a unique design, different units are not interchangeable, and due to the high level of customization involved in the production of these devices, interchangeability is limited. Importer *** highlighted the difference in frequency standards (50 vs 60 Hz) as affecting interchangeability.

Table II-15
LPTs: Count of U.S. producers reporting the interchangeability between product produced in the United States and in other countries, by country pair

Number of firms reporting

Country pair	Always	Frequently	Sometimes	Never
United States vs. South Korea	4	0	1	2
United States vs. Other	4	0	1	2
South Korea vs. Other	4	0	1	2

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

Table II-16
LPTs: Count of importers reporting the interchangeability between product produced in the United States and in other countries, by country pair

Number of firms reporting

Country pair	Always	Frequently	Sometimes	Never
United States vs. South Korea	3	0	2	3
United States vs. Other	3	0	3	4
South Korea vs. Other	3	0	2	4

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

Table II-17
LPTs: Count of purchasers reporting the interchangeability between product produced in the United States and in other countries, by country pair

Number of firms reporting

Country pair	Always	Frequently	Sometimes	Never
United States vs. South Korea	5	3	2	0
United States vs. Other	4	5	3	0
South Korea vs. Other	5	4	1	0

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

In addition, U.S. producers, importers, and purchasers were asked to assess how often differences other than price were significant in sales of LPTs from the United States, subject, or nonsubject countries. As seen in tables II-18 to II-20, firms' responses were varied. Most U.S. producers reported that non-price factors were always, never, or sometimes important when comparing domestic LPTs with products from subject sources. Most importers and purchasers reported that non-price factors were always or sometimes important. U.S. producers *** reported that factors other than price, such as flexible design capacity, lead-time capability, quality, availability of production slot, delivery due date, job site location, and technical support, are often more important to customers. U.S. producer *** described how customers consider the lifetime total cost/benefit, as transformers are expected to last more than 20 years. Importer *** stated that its customers consider quality, lead time, advanced production facilities, design engineering, workmanship, customer service level and flexibility, supply performance record, and long-term relationships with manufacturing and designing engineers when purchasing LPTs. Importer *** also adds that customers value the availability of production slots and job site locations when purchasing their transformers.

Among purchasers, *** highlighted that factors other than price are significant regardless of the supply source. Purchaser *** reported lead times as a key difference between the domestic and Mexican LPTs, noting that domestic products usually have an additional year lead time. *** states that domestic producers have lesser LPT manufacturing capability compared to South Korea and other countries, specifically stating that domestic factories cannot build 500 kV+ LPTs, 765kV LPTs, DC transformers, or phase shifters. Purchaser *** reports that regardless of which country they purchase from, technical specification is considered above price.

Table II-18
LPTs: Count of U.S. producers reporting the significance of differences other than price between product produced in the United States and in other countries, by country pair

Number of firms reporting

Country pair	Always	Frequently	Sometimes	Never
United States vs. South Korea	2	1	3	2
United States vs. Other	2	1	3	2
South Korea vs. Other	2	1	3	2

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

Table II-19
LPTs: Count of importers reporting the significance of differences between product produced in the United States and in other countries, by country pair

Number of firms reporting

Country pair	Always	Frequently	Sometimes	Never
United States vs. South Korea	3	1	3	1
United States vs. Other	4	1	3	1
South Korea vs. Other	4	1	3	1

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

Table II-20
LPTs: Count of purchasers reporting the significance of differences between product produced in the United States and in other countries, by country pair

Number of firms reporting

Country pair	Always	Frequently	Sometimes	Never
United States vs. South Korea	3	0	6	1
United States vs. Other	4	2	7	0
South Korea vs. Other	2	0	7	1

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

Elasticity estimates

This section discusses elasticity estimates. Joint respondents contend that capacity constraints and practical limitations on increasing shipments indicate a lower elasticity of domestic supply in the U.S. market for LPTs.[15] Based on the information discussed above on long lead times and advance order requirements for slot orders as an indicator of capacity and production capability, staff has revised the U.S. supply elasticity estimate.

U.S. supply elasticity

The domestic supply elasticity for LPTs measures the sensitivity of the quantity supplied by U.S. producers to changes in the U.S. market price of LPTs. The elasticity of domestic supply depends on several factors including the level of excess capacity, the ease with which producers can alter capacity, producers' ability to shift to production of other products, the existence of inventories, and the availability of alternate markets for U.S.-produced LPTs. Analysis of these factors above indicates that the U.S. industry has the ability to at least moderately increase or decrease shipments to the U.S. market; an estimate in the range of 3 to 5 is suggested.

U.S. demand elasticity

The U.S. demand elasticity for LPTs measures the sensitivity of the overall quantity demanded to a change in the U.S. market price of LPTs. This estimate depends on factors discussed above such as the existence, availability, and commercial viability of substitute products, as well as the component share of the LPTs in the production of any downstream products. Based on the available information, the aggregate demand for LPTs is likely to be highly inelastic; a range of -0.05 to -0.25 is suggested.

Substitution elasticity

The elasticity of substitution depends upon the extent of product differentiation between the domestic and imported products.[16] Product differentiation, in turn, depends upon such factors as quality (e.g., chemistry, appearance, etc.) and conditions of sale (e.g., availability, sales terms/discounts/promotions, etc.). Based on available information, the

[15] Joint respondents prehearing report, p. 15.

[16] The substitution elasticity measures the responsiveness of the relative U.S. consumption levels of the subject imports and the domestic like products to changes in their relative prices. This reflects how easily purchasers switch from the U.S. product to the subject products (or vice versa) when prices change.

elasticity of substitution between U.S.-produced LPTs and imported LPTs is likely to be in the range of 2 to 5.

Part III: Condition of the U.S. industry

Overview

The information in this section of the report was compiled from responses to the Commission's questionnaires. Ten firms, which accounted for the vast majority of U.S. production of LPTs during 2023, supplied information on their operations in this review.[1]

Table III-1 presents developments in the U.S. industry since January 1, 2018.

Table III-1
LPTs: Developments in the U.S. industry since 2018

Item	Firm	Event
Expansion	Siemens	2/15/2024 – Announced $150 million expansion in Charlotte, NC
Expansion	HD HPT USA	1/31/2023 – Announced $86.3 million contract with American Electric Suppliers
Expansion	WEG Transformers	8/30/23 – WEG expands one of its Washington, MO facilities to allow for a 40 percent increase in production capacity. This investment was worth more than $10 million.
Expansion	Delta Star	5/3/2023 – Announced $30 million expansion at Lynchburg, VA plant
Expansion	Hitachi	10/12/2022 – Announced $37 million expansion of South Boston, VA plant
Merger/Acquisition	Hitachi	10/4/2022 – Hitachi purchased ABB's remaining 19.9 percent stake in Hitachi Energy, fully acquiring ABB's U.S. grid business, including its LPT production facilities in the U.S.
Merger/Acquisition	Prolec-GE Waukesha	10/05/2021 – Acquired SPX Transformer Solutions
Factory Opening	WEG Transformers	9/5/2021 – WEG announces a $17 million investment to
Merger/Acquisition	Hitachi and ABB	7/1/2020 – Hitachi and ABB formed a joint venture, Hitachi Energy, after Hitachi purchased 80.1 percent of ABB's power grid business.

Table continued.

[1] As discussed earlier in Part I, MEPPI sold its Memphis manufacturing plant to Hyosung Heavy Industries in 2020 and no longer manufactures LPTs in the USA. MEPPI provided historical U.S. shipments data for 2018-20. Howard ***. Howard's producer questionnaire response, section II-3-a, II-9-a-b. ***.

Table III-1 Continued
LPTs: Developments in the U.S. industry since 2018

Item	Firm	Event
Merger/Acquisition	Hitachi	9/28/2020 – Announced plans to acquire Pioneer Solutions
Merger/Acquisition	Hyosung Heavy Industries	12/16/2019 – Hyosung Heavy Industries announces plans to buy MEPPI Electric Power Products plant, Memphis, TN
Merger/Acquisition	Hyosung Heavy Industries	5/13/2019 – Acquired Iconics
Expansion	HD HPT USA	4/17/2018 – Announced $33 million investment to increase production by more than 60 percent at its Montgomery, AL facility.
New regulations	Industry-wide	8/16/2022 – Inflation Reduction Act 11/15/2021 – Infrastructure Investment and Jobs Act

Sources: Kim, "Korea's Hyundai Electric wins $86 mn transformer deal in US," January 31, 2023, https://www.kedglobal.com/energy/newsView/ked202301310015; Delta Star, May 3, 2023, "Delta Star to Expand Operations in Virginia," https://www.deltastar.com/newsroom/delta-star-to-expand-operations-in-virginia/; Hitachi Website, "Hitachi ABB Power Grids acquires Pioneer Solutions LLC and strengthens Energy Portfolio Management," September 28, 2020, https://www.hitachi.us/press/Hitachi-ABB-Power-Grids-acquires-Pioneer-Solutions-LLC; Memphis Commercial Appeal, "Hyosung Heavy Industries to buy MEPPI Electric site in Memphis, create 410 jobs," December 13, 2019, https://www.commercialappeal.com/story/money/business/2019/12/13/hyosung-heavy-industries-MEPPI-electric-factory-memphis/2636777001/; MEPPI Electric Website, "MEPPI Electric to Acquire ICONICS, Inc. in United States," May 13, 2019, https://us.MEPPIelectric.com/en/news/releases/global/2019/0513-a/index.html; Delaloye, "Power Transformers: born in the USA," February 15, 2024, https://www.siemens-energy.com/global/en/home/stories/transformer-manufacturing-and-service-expansion-in-us.html; https://www.powertransformernews.com/2021/05/05/siemens-energy-to-shut-olean-plant/; Public Law 117–169, https://www.congress.gov/117/plaws/publ169/PLAW-117publ169.pdf; Public Law 117-58, https://www.congress.gov/117/plaws/publ58/PLAW-117publ58.pdf; Colthorpe, "Hitachi Buys Out ABB's Remaining Stake in Energy and Power Grids Business," October 4, 2022, https://www.energy-storage.news/hitachi-buys-out-abbs-remaining-stake-in-energy-and-power-grids-business/; Hitachi Global, "Hitachi Completes Acquisition of ABB's Power Grids Business," July 1, 2020, https://www.hitachi.com/New/cnews/month/2020/07/f_200701.pdf; Made in Alabama, "Hyundai Power Transformers to Expand in Alabama with 86 New Jobs," April 17, 2018, https://www.madeinalabama.com/2018/04/hyundai-power-transformers-to-expand-in-alabama-with-86-new-jobs/; Riley, "WEG Expands in Washington," August 30, 2023; https://www.emissourian.com/local_news/weg-expands-in-washington/article_3ff36c2a-46af-11ee-9eaa-bf67426d6c89.html; WEG, "WEG Opens its 5th Transformer Factory in North America," September 15, 2021, https://www.weg.net/institutional/US/en/news/result-and-investiments/weg-opens-its-5th-transformer-factory-in-north-america;

Changes experienced by the industry

Producers in the United States were asked to report any change in the character of their operations or organization relating to the production of LPTs since 2018. Nine of ten producers indicated in their questionnaires that they had experienced such changes. Table III-2 presents the changes identified by these producers. Four U.S. producers reported expansions to increase capacity or capabilities, three U.S. reported acquisitions, and four reported new labor or collective bargaining agreements since 2018.

Table III-2
LPTs: Reported changes in operations since January 1, 2018

Type of change	Firm name and narrative on changes in operations
Plant openings	***
Plant openings	***.
Plant closings	***
Plant closings	***
Expansions	***
Expansions	***
Expansions	***
Expansions	***
Acquisitions	***
Acquisitions	***
Acquisitions	***

Table continued.

Table III-2 Continued.
LPTs: Reported changes in operations since January 1, 2018

Type of change	Firm name and narrative on changes in operations
Consolidations	***
Weather related or force majeure events	***
Other	***
Other	***
Other	***
Other	***

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

Anticipated changes in operations

The Commission asked domestic producers to report anticipated changes in the character of their operations relating to the production of LPTs. Their responses appear in table III-3.

Table III-3
LPTs: Anticipated changes in operations

Firm name	Narrative on anticipated changes in operations
***	***
***	***
***	***
***	***
***	***
***	***

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

U.S. production, capacity, and capacity utilization

Table III-4 presents U.S. producers' installed overall capacity, practical overall capacity and LPT-specific capacity and production of LPTs and other products using the same equipment, machinery, or employees as used to produce LPTs. While U.S. producers' installed overall capacity was steady during 2021-23, practical overall capacity increased by 7.6 percent. This increase was due to ***.

Overall production declined slightly from 2021 to 2022 before increasing in 2023 for a net increase of 1.3 percent during 2021-23. Practical overall capacity utilization declined by 4.6 percentage points during 2021-23.

Table III-4
LPTs: U.S. producers' installed and practical capacity and production on the same equipment as in-scope production, by period

Capacity and production in MVA top rated; utilization in percent

Item	Measure	2021	2022	2023
Installed overall	Capacity	92,212	92,212	92,212
Installed overall	Production	56,738	54,869	57,449
Installed overall	Utilization	61.5	59.5	62.3
Practical overall	Capacity	73,020	74,820	78,570
Practical overall	Production	56,738	54,869	57,449
Practical overall	Utilization	77.7	73.3	73.1
Practical LPT	Capacity	58,870	61,758	66,174
Practical LPT	Production	49,724	48,178	51,398
Practical LPT	Utilization	84.5	78.0	77.7

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

Table III-5 and figure III-1 present U.S. producers' LPTs production, capacity, and capacity utilization. U.S. producers' LPTs capacity increased by 12.4 percent during 2021-23. This increase was driven by ***.

U.S. producers' production decreased by 3.1 percent from 2021 to 2022 before increasing by 6.7 percent in 2023 for a net increase of 3.4 percent during 2021-23. Five of seven responding U.S. producers reported increased LPTs production during this period. With the increase in LPTs capacity greater than the increase in LPTs production,[2] U.S. producers' capacity utilization decreased by 6.8 percentage points during 2021-23, from 84.5 percent to 77.7 percent.

[2] In 2023, U.S. producers' reported capacity exceeded reported production by 14,776 MVA, with *** accounting for *** percent of that figure.

Table III-5
LPTs: U.S. producers' output, by firm and period

Practical capacity

Capacity in MVA top rated

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	58,870	61,758	66,174

Table continued.

Table III-5 Continued
LPTs: U.S. producers' output, by firm and period

Production

Production in MVA top rated

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	49,724	48,178	51,398

Table continued.

Table III-5 Continued
LPTs: U.S. producers' output, by firm and period

Capacity utilization

Capacity utilization in percent

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	84.5	78.0	77.7

Table continued.

Table III-5 Continued
LPTs: U.S. producers' output, by firm and period

Share of production

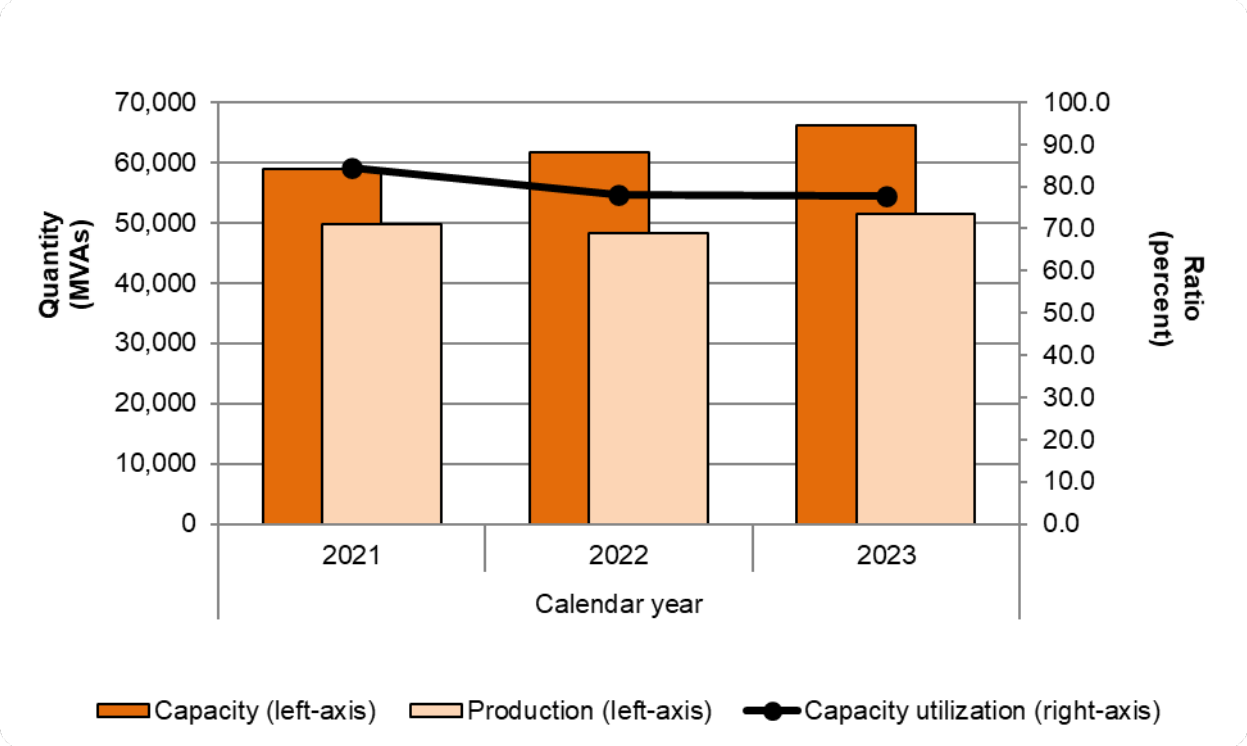
Share in percent

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	100.0	100.0	100.0

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Figure III-1
LPTs: U.S. producers' output, by period



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

The Commission asked U.S. producers whether they have the capability to produce LPTs with an MVA (top-rated) of 500 to 799, MVA (top-rated) of 800 or greater, and whether they actually produced such LPTs. As presented in table III-6, the majority of U.S. producers reported that they were unable to produce LPTs with an MVA (top-rated) of 500 to 799 or with an MVA (top-rated) of 800 or greater, but multiple firms reported actual production or the ability to produce such LPTs.

Table III-6
LPTs: U.S. producers' reported actual production and production capabilities, by specific MVA top rated categories

Item	Measure	500 to 799 MVA top rated	800+ MVA top rated
Actual produced within period	Count of firms	***	***
Ability to produce, but did not produce	Count of firms	***	***
Inability to produce	Count of firms	***	***
All firms	Count of firms	***	***

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

Note: Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Alternative products

As shown in table III-7, LPTs accounted for at least 87.6 percent of the products produced on the same equipment each year during 2021-23. Five firms reported producing other products such as smaller power transformers and mobile substation transformers.[3]

Table III-7
LPTs: U.S. producers' overall production on the same equipment as in-scope production, by period

Quantity in MVA top rated; shares in percent

Product type	Measure	2021	2022	2023
LPTs	Quantity	49,724	48,178	51,398
Other products	Quantity	7,014	6,691	6,051
All products	Quantity	56,738	54,869	57,449
LPTs	Share	87.6	87.8	89.5
Other products	Share	12.4	12.2	10.5
All products	Share	100.0	100.0	100.0

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

[3] ***.

All responding U.S. producers that reported production of both LPTs and other products on the same equipment stated that they are able to switch production (capacity) between LPTs and other products using the same equipment and/or labor. There are no reported significant operational factors that restrain and affect the ability to shift capacity between products, in this case LPTs and other out-of-scope medium and small power transformers. According to responding U.S. producers, the factors that affect the product mix and shifting capacity are ***. One U.S. producer, ***, who did not report producing other products, reported that ***.

Constraints on capacity

Eight of the ten responding U.S. producers reported constraints in the manufacturing process. All eight cited existing labor force, the most commonly cited category, as a constraint, followed by supply of material inputs and production bottlenecks, cited by six and four U.S. producers, respectively. Table III-8 presents U.S. producers' reported narratives regarding practical capacity constraints.

Table III-8
LPTs: U.S. producers' reported capacity constraints, by type of constraint and firm

Type of change	Firm name and narrative on constraints to practical overall capacity
Production bottlenecks	***
Production bottlenecks	***
Production bottlenecks	***
Production bottlenecks	***
Production bottlenecks	***
Existing labor force	***
Existing labor force	***
Existing labor force	***
Existing labor force	***
Existing labor force	***
Existing labor force	***
Existing labor force	***
Existing labor force	***.
Existing labor force	***
Supply of material inputs	***
Supply of material inputs	***
Supply of material inputs	***
Supply of material inputs	***
Supply of material inputs	***
Supply of material inputs	***.

Table continued.

Table III-8
LPTs: U.S. producers' reported capacity constraints, by type of constraint and firm

Type of change	Firm name and narrative on constraints to practical overall capacity
Storage capacity	***
Storage capacity	***
Logistics/transportation	***
Other constraints	***
Other constraints	***

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

The Commission also asked U.S. producers whether they are able to switch production (capacity) between LPTs produced in the United States and LPTs produced in other countries for the purposes of supplying LPTs to the U.S. market. Six U.S. producers responded that they are able to produce and/or source LPTs from related or parent companies in other countries – *** and ***. Table III-9 presents firms' explanations of the ability to switch production (capacity) geographically and the other geographic production locations and table III-10 presents their description of factors that affect the ability to shift sources of supply between U.S.-produced and other than U.S.-produced LPTs.

Table III-9
LPTs: U.S. producers' explanation of ability to switch production geographically since January 1, 2018, by type of change and firm

Firm name	Narrative explanation of ability to switch production geographically
***	***
***	***
***	***
***	***
***	***
***	***

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

Table III-10
LPTs: U.S. producers' explanation of factors impacting ability to switch since January 1, 2018, by type of change and firm

Firm name	Narrative explanation of factors impacting ability to switch
***	***
***	***
***	***
***	***
***	***

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

Production-related activities

Three firms, ***, reported imports of incomplete LPTs (i.e., steel core or shell, the windings, electrical insulation between the windings, or the mechanical frame for an LPT) for purposes of producing a finished LPT in the United States. ***'s imports of incomplete LPTs were equivalent to ***, ***, and *** percent of its reported U.S. LPT production in 2021, 2022, and 2023, respectively.[4] ***'s imports of incomplete LPTs were equivalent to ***, ***, and *** percent of its reported U.S. LPT production in 2021, 2022, and 2023, respectively.[5] ***'s imports of incomplete LPTs were equivalent to *** percent of its reported U.S. LPT production in 2023.[6]

The Commission asked domestic producers to describe their domestic operations with respect to manufacturing LPTs, including, if applicable, any incorporation of imported or purchased subassemblies[7] into an LPT in the United States, as well as the nature and extent of several items related to the manufacturing of LPTs. These responses are presented in tables III-11 and III-12.

[4] ***. *** producer questionnaire response, section II-3-b.

[5] ***. *** producer questionnaire response, section II-3-b.

[6] ***. *** producer questionnaire response, section II-3-a.

[7] LPT subassemblies include active parts or the cores, windings, or mechanical frames of active parts not already assembled into an LPT.

Table III-11
LPTs: U.S. producers' explanation of domestic activities since January 1, 2018, by type of change and firm

Firm name	Narrative explanation of domestic activities
***	***
***	***
***	***
***	***
***	***
***	***
***	***
***	***
***	***
***	***

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

Table III-12
LPTs: U.S. producers' domestic activities by factor since January 1, 2018, by type of change and firm

Type of activity	Firm name and narrative on domestic activities by factor
Capital investments	***
Capital investments	***
Capital investments	***
Capital investments	***
Capital investments	***
Capital investments	***
Capital investments	***
Capital investments	***
Capital investments	***.
Capital investments	***
Technical expertise	***
Technical expertise	***
Technical expertise	***
Technical expertise	***
Technical expertise	***
Technical expertise	***
Technical expertise	***.
Technical expertise	***

Table continued.

Table III-12 Continued
LPTs: U.S. producers' domestic activities by factor since January 1, 2018, by type of change and firm

Type of activity	Firm name and narrative on domestic activities by factor
Value added	***
Value added	***
Value added	***
Value added	***
Value added	***
Value added	***
Value added	***.
Value added	***
Employment	***
Employment	***
Employment	***
Employment	***
Employment	***
Employment	***
Employment	***
Employment	***
Employment	***
Employment	***

Table continued.

Table III-12 Continued
LPTs: U.S. producers' domestic activities by factor since January 1, 2018, by type of change and firm

Type of activity	Firm name and narrative on domestic activities by factor
Quantity, type, and source of parts	***
Quantity, type, and source of parts	***
Quantity, type, and source of parts	***
Quantity, type, and source of parts	***
Quantity, type, and source of parts	***
Quantity, type, and source of parts	***
Quantity, type, and source of parts	***
Costs and activities	***
Costs and activities	***
Costs and activities	***
Costs and activities	***
Costs and activities	***
Costs and activities	***
Costs and activities	***

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

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

Table III-13 presents U.S. producers' U.S. shipments, export shipments, and total shipments of LPTs. U.S. shipments, by quantity, increased by 10.7 percent from 2021 to 2022 before decreasing by 3.9 percent in 2023, for a net increase of 6.4 percent during 2021-23. U.S. shipments, by value, increased continuously by 65.6 percent during 2021-23. Unit values of U.S. shipments also increased continuously by 55.6 percent during 2021-23. Virtually all shipments reported by domestic producers were U.S. shipments. ***.

Table III-13
LPTs: U.S. producers' shipments, by destination and period

Quantity in MVA top rated; value in 1,000 dollars; unit value in dollars per MVA top rate; shares in percent

Item	Measure	2021	2022	2023
U.S. shipments	Quantity	48,191	53,367	51,267
Export shipments	Quantity	***	***	***
Total shipments	Quantity	***	***	***
U.S. shipments	Value	449,077	572,588	743,475
Export shipments	Value	***	***	***
Total shipments	Value	***	***	***
U.S. shipments	Unit value	9,319	10,729	14,502
Export shipments	Unit value	***	***	***
Total shipments	Unit value	***	***	***
U.S. shipments	Share of quantity	***	***	***
Export shipments	Share of quantity	***	***	***
Total shipments	Share of quantity	100.0	100.0	100.0
U.S. shipments	Share of value	***	***	***
Export shipments	Share of value	***	***	***
Total shipments	Share of value	100.0	100.0	100.0

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

Table III-14 presents U.S. producers' U.S. shipments by type. Transfers to related firms were reported by two domestic producers, ***, and accounted for *** percent of total U.S. shipments in 2021, *** percent in 2022, and *** percent in 2023, by quantity.[8] Unit values for U.S. shipments of transfers to related firms were lower for each year during 2021-23. There were no U.S. shipments for internal consumption reported by domestic producers.

Table III-14
LPTs: U.S. producers' U.S. shipments, by type and period

Quantity in MVA top rated; value in 1,000 dollars; unit value in dollars per MVA top rate; shares in percent

Item	Measure	2021	2022	2023
Commercial U.S. shipments	Quantity	***	***	***
Transfers to related firms	Quantity	***	***	***
U.S. shipments	Quantity	48,191	53,367	51,267
Commercial U.S. shipments	Value	***	***	***
Transfers to related firms	Value	***	***	***
U.S. shipments	Value	449,077	572,588	743,475
Commercial U.S. shipments	Unit value	***	***	***
Transfers to related firms	Unit value	***	***	***
U.S. shipments	Unit value	9,319	10,729	14,502
Commercial U.S. shipments	Share of quantity	***	***	***
Transfers to related firms	Share of quantity	***	***	***
U.S. shipments	Share of quantity	100.0	100.0	100.0
Commercial U.S. shipments	Share of value	***	***	***
Transfers to related firms	Share of value	***	***	***
U.S. shipments	Share of value	100.0	100.0	100.0

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

[8] ***. ***'s producer questionnaire response, section II-13.
***. ***'s producer questionnaire response, section II-3-a, II-13.

The Commission also asked U.S. producers to report their U.S. shipments of U.S.-produced LPTs by top MVA rating during 2021-23. Data for quantity of such U.S. shipments in 2023 are presented in table III-15 and Figure III-2 and are presented in greater detail in Appendix F. U.S. producers' U.S. shipments of LPTs with MVA top rating of 60 to 299 MVA represented the largest share of total U.S. shipments, ranging from *** precent to *** percent during 2021-23, followed by LPTs with MVA top rating of 300 to 499 MVA and LPTs with MVA top rating of 500 to 799 MVA. ***.

Table III-15
LPTs: U.S. producers' U.S. shipments, by MVA top rated category and period

Quantity in MVA top rated; shares in percent

Item	Measure	2021	2022	2023
60-299 MVA top rated	Quantity	***	***	***
300-499 MVA top rated	Quantity	***	***	***
500-799 MVA top rated	Quantity	***	***	***
800+ MVA top rated	Quantity	***	***	***
All MVA top rated categories	Quantity	***	***	***
60-299 MVA top rated	Share of quantity	***	***	***
300-499 MVA top rated	Share of quantity	***	***	***
500-799 MVA top rated	Share of quantity	***	***	***
800+ MVA top rated	Share of quantity	***	***	***
All MVA top rated categories	Share of quantity	100.0	100.0	100.0

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

Figure III-2
LPTs: U.S. producers' U.S. shipments, by MVA top rated category and period

* * * * * * *

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

U.S. producers' inventories

Table III-16 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. Only *** reported any end-of-period inventories, which were lowest in 2022, and decreased overall during 2021-23 by *** percent. As a ratio to U.S. producers' production, U.S. shipments, and total shipments, end-of-period inventories ranged from *** percent to *** percent in 2021, *** percent to *** percent in 2022 and were *** percent for all three in 2023.

Table III-16
LPTs: U.S. producers' inventories and their ratio to select items, by period

Quantity in MVA top rated; inventory Ratios in percent

Item	Measure	2021	2022	2023
End-of-period inventory	Quantity	***	***	***
Inventory to U.S. production	Ratio	***	***	***
Inventory to U.S. shipments	Ratio	***	***	***
Inventory to total shipments	Ratio	***	***	***

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

U.S. producers' imports from South Korea

Two U.S. producers, ***, reported imports of LPTs from South Korea by related firms.[9] These data are presented in tables III-17 and III-18. *** imported subject LPTs in 2022 and 2023 that accounted for *** percent and *** percent, respectively, of its U.S. LPTs production. *** imported subject LPTs in 2021 and 2023 that accounted for *** percent and *** percent, respectively, of its U.S. LPTs production. The two producers' reported reasons for importing subject LPTs are listed in table III-19.

Table III-17
LPTs: *'s U.S. production, subject U.S. imports, and ratio of subject imports to production, by source and by period, 2021-23**

Quantity in MVA top rated; ratio in percent

Item	Measure	2021	2022	2023
U.S. production	Quantity	***	***	***
Imports from South Korea	Quantity	***	***	***
Imports from South Korea to U.S. production	Ratio	***	***	***

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

Note: Zeroes, null values, and undefined calculations are suppressed and shown as "---".

[9] *** reported imports of LPTs from South Korea by related firm *** and *** reported imports of LPTs from South Korea by related firm ***.

Table III-18
LPTs: *'s U.S. production, subject U.S. imports, and ratio of subject imports to production, by source and by period, 2021-23**

Quantity in MVA top rated; ratio in percent

Item	Measure	2021	2022	2023
U.S. production	Quantity	***	***	***
Imports from South Korea	Quantity	***	***	***
Imports from South Korea to U.S. production	Ratio	***	***	***

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

Note: Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Table III-19
LPTs: U.S. producers' reasons for importing

Item	Narrative response on reason(s) for importation
***'s reason for importing	***
***'s reason for importing	***

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

U.S. producers' purchases of imports from subject sources

No responding U.S. producer reported purchases of LPTs during 2021-23.

U.S. employment, wages, and productivity

Table III-20 shows U.S. producers' employment-related data. The number of production and related workers ("PRWs") reported by U.S. producers increased by 36.9 percent during 2021-23, from 1,232 to 1,686. Total hours worked and wages paid also increased by 37.1 percent and 59.4 percent, respectively, during the same period while total hours worked per PRW remained steady. During 2021-23, the average hourly wage increased from $28.70 per hour in 2021 to $33.38 per hour in 2023, an increase of 16.3 percent. Productivity declined by 24.6 percent during the same period. The decline in productivity and rising hourly wages resulted in higher unit labor costs, which increased by 54.2 percent during 2021-23.

Table III-20
LPTs: U.S. producers' employment related information, by period

Item	2021	2022	2023
Production and related workers (PRWs) (number)	1,232	1,397	1,686
Total hours worked (1,000 hours)	2,584	2,963	3,542
Hours worked per PRW (hours)	2,097	2,121	2,101
Wages paid ($1,000)	74,150	93,176	118,217
Hourly wages (dollars per hour)	$28.70	$31.45	$33.38
Productivity (MVA top rated per 1,000 hours)	19.2	16.3	14.5
Unit labor costs (dollars per MVA top rated)	$1,491	$1,934	$2,300

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

Financial experience of U.S. producers

Background[10]

The majority of U.S. producers that reported financial results to the Commission are either subsidiaries of publicly traded companies (***) or jointly owned by publicly traded companies (***), although several companies (***) identified themselves as privately held.[11] The reported LPT financial results are based on information from accounting systems designed to generate/report overall financial results on a U.S. GAAP basis and were reported for ***.[12]

While U.S. producers engage in similar LPT production-related activity, they also noted various distinguishing characteristics such as the extent to which LPT components are directly fabricated versus purchased, the MVA range that can be produced, and degree of direct responsibility for activities such as sales and marketing, R&D, and maintenance.[13]

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[10] The following abbreviations are used in the tables and/or text of this section: generally accepted accounting principles ("GAAP"), fiscal year ("FY"), net sales ("NS"), cost of goods sold ("COGS"), selling, general, and administrative expenses ("SG&A expenses"), average unit values ("AUVs"), research and development ("R&D"), and return on assets ("ROA").

[11] *** U.S. producer questionnaires, section I-2b. ***.

[12] *** U.S. producer questionnaires, section III-2.

[13] ***. Email with attachment from ***, May 3, 2024. ***. Email with attachment from ***, May 3, 2024. ***

***. Email with attachment from ***, May 3, 2024. As noted below, *** provided a similar description regarding the separation of LPT sales and production activity (see footnote 25).

As described previously, U.S. producers experienced various changes in their operations since 2018: ***. As described below, some of the above-noted changes in operations impacted (directly and/or indirectly) reported LPT financial results during 2021 through 2023.

Figure III-3 presents each responding firm's share of the total reported net sales quantity in 2023.

Figure III-3
LPTs: U.S. producers' share of net sales quantity in 2023, by firm

* * * * * * *

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

Operations on LPTs

Table III-21 and table III-22 present income-and-loss data for the U.S. producers' LPT operations and corresponding changes in AUVs, respectively.[14] Appendix G presents selected company-specific financial information.

Table III-21
LPTs: U.S. producers' results of operations, by item and period

Quantity in MVA top rated; value in 1,000 dollars

Item	Measure	2021	2022	2023
Commercial sales	Quantity	***	***	***
Transfers to related firms	Quantity	***	***	***
Total net sales	Quantity	***	***	***
Commercial sales	Value	***	***	***
Transfers to related firms	Value	***	***	***
Total net sales	Value	***	***	***
COGS: Raw materials	Value	***	***	***
COGS: Direct labor	Value	***	***	***
COGS: Other factory costs	Value	***	***	***
COGS: Total	Value	***	***	***
Gross profit or (loss)	Value	***	***	***
SG&A expenses	Value	***	***	***
Operating income or (loss)	Value	***	***	***
Interest expense	Value	***	***	***
All other expenses	Value	***	***	***
All other income	Value	***	***	***
Net income or (loss)	Value	***	***	***
Depreciation/amortization included above	Value	***	***	***
Estimated cash flow from operations	Value	***	***	***

Table continued

[14] Overall changes in U.S. industry's product mix, reflecting changes in underlying company-specific market share and product mix (see *Net sales* section below), indicate that a variance analysis of the U.S. industry's financial results would be less meaningful and is therefore not presented in this section of the report.

Table III-21 Continued
LPTs: U.S. producers' results of operations, by item and period

Ratios in percent; shares in percent; unit values in dollars per MVA top rated; count in number of firms reporting

Item	Measure	2021	2022	2023
COGS: Raw materials	Ratio to NS	***	***	***
COGS: Direct labor	Ratio to NS	***	***	***
COGS: Other factory costs	Ratio to NS	***	***	***
COGS: Total	Ratio to NS	***	***	***
Gross profit or (loss)	Ratio to NS	***	***	***
SG&A expenses	Ratio to NS	***	***	***
Operating income or (loss)	Ratio to NS	***	***	***
Net income or (loss)	Ratio to NS	***	***	***
COGS: Raw materials	Share	***	***	***
COGS: Direct labor	Share	***	***	***
COGS: Other factory costs	Share	***	***	***
COGS: Total	Share	***	***	***
Commercial sales	Unit value	***	***	***
Transfers to related firms	Unit value	***	***	***
Total net sales	Unit value	***	***	***
COGS: Raw materials	Unit value	***	***	***
COGS: Direct labor	Unit value	***	***	***
COGS: Other factory costs	Unit value	***	***	***
COGS: Total	Unit value	***	***	***
Gross profit or (loss)	Unit value	***	***	***
SG&A expenses	Unit value	***	***	***
Operating income or (loss)	Unit value	***	***	***
Net income or (loss)	Unit value	***	***	***
Operating losses	Count	***	***	***
Net losses	Count	***	***	***
Data	Count	7	7	7

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

Note: Ratios represent the ratio to net sales value and shares represent the share of COGS.

Table III-22
LPTs: Changes in AUVs between comparison periods

Changes in percent

Item	2021-23	2021-22	2022-23
Commercial sales	***	***	***
Transfers to related firms	***	***	***
Total net sales	***	***	***
COGS: Raw materials	***	***	***
COGS: Direct labor	***	***	***
COGS: Other factory costs	***	***	***
COGS: Total	***	***	***

Table continued.

Table III-22 Continued
LPTs: Changes in AUVs between comparison periods

Changes in dollars per MVA top rated

Item	2021-23	2021-22	2022-23
Commercial sales	***	***	***
Transfers to related firms	***	***	***
Total net sales	***	***	***
COGS: Raw materials	***	***	***
COGS: Direct labor	***	***	***
COGS: Other factory costs	***	***	***
COGS: Total	***	***	***
Gross profit or (loss)	***	***	***
SG&A expense	***	***	***
Operating income or (loss)	***	***	***
Net income or (loss)	***	***	***

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

Note: Period changes preceded by a "▲" represent an increase, while period changes preceded by a "▼" represent a decrease.

Net sales

For the entire period for which data were requested the U.S. industry' commercial sales accounted for *** percent of total net sales quantity with the remaining *** percent accounted for by transfer sales. The share of commercial LPT sales quantity declined from *** percent in 2021 to *** percent in 2023, while the corresponding share of transfer sales increased from *** percent in 2021 to *** percent in 2023. This pattern is attributable primarily to *** U.S. producers to report LPT transfer sales. Given the importance of both sales categories, line items for commercial sales and transfer sales are presented in the relevant tables above.

The time between a customer's LPT order, LPT construction, and delivery to customer can be considerable.[15] While a number of U.S. producers defer revenue recognition until the date of delivery, several reported that all or a portion of their LPT sales are recognized based on specific milestones. The *** U.S. producers in terms of both quantity and net sales value (***) reported different revenue recognition methods: *** (entirely date of delivery); *** (primarily based on milestones (*** percent of sales) with date of delivery accounting for the remainder).[16] [17] As reported to the Commission, sales value reflects LPTs on a stand-alone basis and generally does not include revenue associated with services such as installation and maintenance.[18]

In 2023 the LPT sales of most U.S. producers were concentrated in the 60-299 MVA top rated range with several U.S. producers (***) reporting that sales were limited to that range.[19] While still concentrated in the 60-299 MVA top rated range,

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[15] Company-specific lead times between customer order and delivery of LPTs varied and, for most U.S. producers, increased substantially during 2021 through 2023. In 2021, lead time ranged from a low of *** days (***) to a high of *** days (***); *** being somewhat of an outlier as the next highest lead time was *** days (***). In 2022, lead time increased and ranged from a low of *** days (***) to a high of *** days (***); *** again being somewhat of an outlier as the next highest lead time was *** days (***). In 2023, lead times increased for most U.S. producers and ranged from a low of *** days (***) to a high of *** days (***); the next highest lead time was *** days (***). *** U.S. producer questionnaires, section IV-8a-c.

[16] *** U.S. producer questionnaires, section III-2.B.5.

[17] LPT sales revenue recognition on delivery date generally indicates that title has transferred to the customer at that time. With regard to sales recognition based on milestones, an example provided by *** reported the following stages of recognition: ***. *** U.S. producer questionnaire, section III-2.B.5 (note 1). Percentage of completion is a form of revenue recognition, typically used for long-term projects, in which revenue is recognized over time based on a factor such as costs incurred as a share of total costs to complete. *** U.S. producer (***) recognized a portion of its LPT sales on a percentage of completion basis. *** U.S. producer questionnaire, section III-2.B.5 (note 2).

[18] Email with attachment from ***, May 16, 2024. Email with attachment from ***, May 16, 2024. Email with attachment from ***, May 17, 2024.

[19] *** U.S. producer questionnaires, section III-4. USITC auditor notes. ***

(*continued*...)

*** also reported LPT sales in higher MVA top rated ranges (300-499 and 500-799).[20] *** U.S. producer reported selling LPTs in the 800 plus MVA top rated range.

Quantity

The U.S. industry's total sales quantity (in terms of MVA top rated) increased to its highest level in 2022 and then declined somewhat in 2023. On a company-specific basis U.S. producers were directionally mixed with the majority reporting overall increases in sales quantity between 2021 and 2023 (see table G-1). ***, the two largest U.S. producers in terms of both net sales quantity and net sales value, reported overall declines in net sales quantity between 2021 and 2023.

Value

Table G-1 shows that U.S. producers reported a range of company-specific average sales values, which appears to be consistent with variations in LPT configurations and MVA ratings. With respect to changes in product mix, U.S. producers were not uniform, some reporting that product mix shifted to higher MVA ratings per unit,[21] others reporting decreases in MVA ratings

***. Email with attachments from ***, May 14, 2024.

[20] ***.

[21] ***. Email with attachment from ***, May 3, 2024. ***. Email with attachment from ***, May 3, 2024.

per unit,[22] and several reporting essentially no change in product mix.[23] As noted in the *COGS and gross profit or loss* section below, U.S. producers indicated that increases in LPT sales values reflect strong LPT demand and improved pricing, as well as the need to pass through higher costs.

While direct company-specific comparisons are problematic given differences in product mix, *** U.S. producers reported increasing average sales value.[24] As noted previously, *** were the only U.S. producers that reported transfer sales with the rest reporting commercial sales.[25]

Cost of goods sold and gross profit or loss

Raw materials

On an overall basis, total raw material costs account for the largest share of total LPT COGS, ranging from a low of *** percent of COGS (2021) to a high of *** percent (2023). The

[22] ***. Email with attachment from ***, May 3, 2024. ***. Ibid.

[23] ***. Email with attachment from ***, May 3, 2024. *** stated that there were no substantial changes in its LPT product mix. Email with attachment from ***, May 3, 2024.

[24] At this point the *** was *** whose average sales value increased to its highest level in 2022 and then declined in 2023.

[25] The valuation basis of *** transfer price was reported to be the ***. *** U.S. producer questionnaire, section II-13. As further described by ***. Email with attachment from ***, May 3, 2024. With regard to *** transfer price valuation, the company stated ***. Email with attachment from ***, May 3, 2024.

majority of U.S. producers reported purchasing at least some material inputs from related suppliers.[26]

Based on company-specific cost shares for 2023, GOES generally accounted for the highest share of raw material costs, followed by windings, steel plate, other material inputs, controls and accessories, tap changers, and dielectric mineral oil.[27] [28] Variations in company-specific cost shares accounted for the above-noted inputs appear to reflect differences such as product mix, cost structure, and cost classification.

Similar to the pattern of company-specific average sales value, U.S. producers reported a relatively wide range of average raw material costs (see table G-1). With regard to changes in

[26] *** reported that *** purchased from related suppliers accounted for *** percent of 2023 COGS with valuation basis reported as ***. *** reported that *** purchased from a related supplier accounted for *** percent of 2023 COGS with valuation basis reported as ***. *** reported that *** purchased from related suppliers accounted for *** percent of 2023 COGS with valuation basis reported as ***. *** reported that *** purchased from related suppliers accounted for *** percent of 2023 COGS with valuation basis reported as *** U.S. producer questionnaire, section III-6. With regard to non-material inputs *** reported that related suppliers provided ***, accounting for *** percent of 2023 COGS, with valuation basis identified as ***. *** U.S. producer questionnaire, section III-6.

[27] USITC auditor notes. On a company-specific basis GOES as a share of 2023 total raw material cost ranged from *** percent (***) to *** percent (***); for windings from *** percent (***) to *** percent (***); for steel plate from *** percent (***) to *** percent (***); for other material inputs from *** percent (***) to *** percent (***); for controls and other accessories from *** percent (***) to *** percent (***), for tap changers from *** percent (***) to *** percent (***), and for dielectric mineral oil from *** percent (***) to *** percent (***). *** U.S. Producer questionnaires, section III-9c.

[28] Regarding the impact of 232 measures in general, several U.S. producers reported either *** impact (***) or *** (***). *** U.S. Producer questionnaires, section IV-27. In contrast, *** U.S. producers (***) reported that there was an impact: ***. *** U.S. Producer questionnaires, section IV-27.

average raw material cost, U.S. producers were directionally uniform in 2022 (*** reporting increases in average raw material costs) and uniform, for the most part, in 2023 (*** reporting higher average raw material cost, the ***). For the U.S. industry as a whole the pattern of higher average raw material costs is consistent with company-specific descriptions of increasing material input costs.

Direct labor cost and other factory costs

Noting substantial investments in specialized equipment, as well as extensive use of skilled labor, U.S. producers generally indicated that LPT manufacturing is both labor intensive and capital intensive.[29]

Direct labor cost accounted for the smallest share of COGS (ranging from a low of *** percent of COGS (2023) to a high of *** percent (2022)). The directional pattern of average direct labor cost was *** in 2022 (*** U.S. producers reporting increases), but somewhat mixed in 2023 with *** U.S. producers reporting increases, the exceptions being ***, which reported declines.

Similar to the pattern of average raw material costs, company-specific average direct labor cost reflects a relatively wide range (see table G-1). The pattern of higher average direct labor cost is consistent with higher labor costs in general, as well as changes in product mix. ***, for example, noted that sales of ***.[30]

[29] ***. Email with attachment from ***, May 16, 2024. Other U.S. producers either provided similar descriptions or generally confirmed that they considered LPT manufacturing to be both labor intensive and capital intensive. Email with attachment from ***, May 16, 2024. Email with attachment from ***, May 17, 2024.

[30] Email with attachment from ***, May 3, 2024.

Other factory costs account for the second largest share of COGS (ranging from a low of *** percent of COGS (2023) to a high of *** percent (2021)). While declining as a share of COGS, generally reflecting increases in the corresponding share of raw material costs, the U.S. industry's average other factory costs increased during 2021 through 2023. On a company-specific basis, most U.S. producers reported higher average other factory costs in 2022 (the ***) and in 2023 (the ***). Notwithstanding increases in the U.S. industry's average other factory costs, U.S. producers noted that increased fixed cost absorption, in conjunction with higher capacity utilization, was a positive cost factor.[31]

COGS and gross profit or loss

The U.S. industry's total COGS increased in 2022, in conjunction with higher net sales quantity and increases in all components of average COGS. Notwithstanding a modest decline in sales quantity in 2023, the U.S. industry's total COGS increased again, reflecting a continued increase in average COGS.

Consistent with variations in product mix and underlying cost structure, U.S. producers reported a range of average COGS (see G-1). Directionally, U.S. producers were *** in 2022 (*** reporting increases in average COGS) and, for the most part, directionally *** in 2023 (the *** reporting increase in average COGS with *** reporting declines).[32] Given its importance in terms of explaining company-

[31] ***. Email with attachment from ***, May 3, 2024. ***. Email with attachment from ***, May 3, 2024. ***. Email with attachment from ***, May 3, 2024.

[32] ***

(*continued*...)

specific average COGS and financial results, it should be noted that, in contrast with the Commission's previous review period when there were several start-up operations, *** was the *** U.S. producer whose facility was effectively in its start-up phase (see footnotes 32 and 36).

While the U.S. industry as a whole reported increasing levels of total gross profit in both 2022 and 2023, the more notable increase occurred in 2023. In that year and in addition to most U.S. producers reporting continued increases in gross profit, *** transitioned to a gross profit (see footnote 32).[33] In 2022 the relatively modest expansion of the U.S. industry's gross profit ratio (total gross profit or loss divided by total net sales value) reflects a somewhat larger percentage increase in average net sales value compared to the corresponding percentage increase in average COGS (see table III-22). The more notable expansion in gross profit ratio in 2023 reflects a larger percentage increase in average net sales value as compared to the increase in average COGS.

Table G-1 shows that company-specific gross profit ratios reflect a relatively wide range and that most U.S. producers reported overall increases in their gross profit ratio. Among those U.S. producers reporting increases in their gross profit ratio, ***.[34] *** noted that improved LPT market conditions allowed for increases in price, which in turn resulted in improved profitability.[35]

***. Email with attachment from ***, May 3, 2024.

[33] On a company-specific basis *** U.S. producers reported positive gross profit during 2021 through 2023 (see table G-1). ***.

[34] Email with attachment from ***, May 3, 2024.

[35] ***. Email with attachment from ***, May 3, 2024. ***

(*continued*...)

***, with relatively *** ratios in 2021 and 2022 and a *** ratio in 2023, reported the most notable improvement in gross results during 2021 through 2023.[36]

SG&A expenses and operating income or loss

In conjunction with increases in total net sales quantity and value, the U.S. industry's SG&A expenses increased by a relatively large amount in 2022 followed by a smaller increase in 2023. On a company-specific basis most U.S. producers reported the same directional pattern of increasing total SG&A expenses in 2022. The *** in 2022 was ***, which reported a relatively large decline in its SG&A expenses.[37] In 2023 *** U.S. producers continued to report increases in their SG&A expenses with *** being the exceptions: *** reporting a relatively large decline in its SG&A expenses and *** reporting a relatively large increase.

***. Email with attachment from ***, May 3, 2024. ***. Email with attachments from ***, May 14, 2024.

[36] ***. Email with attachment from ***, May 3, 2024.

[37] ***. Email with attachment from ***, May 3, 2024.

Notwithstanding increases in total SG&A expenses, the U.S. industry's SG&A expense ratio (total SG&A expenses divided by total net sales value) declined modestly during 2021 through 2023, reflecting larger increases in total net sales value compared to corresponding SG&A expenses. On a company-specific basis U.S. producers reported a range of SG&A expense ratios (see table G-1), which is consistent with different operational structures. While U.S. producers were directionally mixed in terms of increases and decreases in their SG&A expense ratios in 2022, they were more uniform in 2023, most experiencing declines.

***, starting off with the highest company-specific SG&A expense ratios, exhibited overall declines during 2021 through 2023. The decline in *** SG&A ratio is generally explained by the *** (see footnote 37). Since *** SG&A expenses increased overall between 2021 and 2023, the decline in its SG&A expense ratio can generally be attributed to increasing total net sales value.[38]

The U.S. industry reported operating losses in 2021 and 2022 and then transitioned to operating income in 2023. The level of total operating losses in 2021 and 2022, in large part, reflects the operating losses reported by ***. To a lesser extent, ***, which reported operating losses of increasing magnitude in 2021 and 2022, also contributed to this pattern. In 2023, reflecting a transition to gross profit (somewhat greater than breakeven), as well as lower corresponding SG&A expenses, *** total operating loss was lower in 2023 compared 2022. *** U.S. producers reported operating income in 2023.

Somewhat over half of U.S. producers reported a relative improvement in their operating income or loss ratios in 2022, which was followed by a more uniform directional pattern in 2023 with most U.S. producers reporting higher positive operating income ratios.[39]

All other expenses and net income or loss

The U.S. industry's operating and net results were directionally the same (increasing/improving on a relative basis somewhat in 2022 and then more substantially in 2023). Due to the presence of interest expense and other expenses, offset partially by other

[38] ***. *** U.S. producer questionnaire, section III-10a-b. ***. Ibid.

[39] *** reported essentially static operating income ratios in 2021, 2022, and 2023.

income, the U.S. industry's net results were lower than corresponding operating results. With 2021 being the exception, interest expense generally had the larger impact in terms of determining the level of net results.[40] [41]

Capital expenditures and research and development expenses

Table III-23 and table III-25 present U.S. producers' capital expenditures and R&D expenses related to their LPT operations, respectively, by firm. Table III-24 and table III-26 present corresponding narrative descriptions.

While most U.S. producers reported the same directional pattern of increasing capital expenditures during 2021 through 2023, *** reported its highest level in 2021 followed by declines in 2022 and 2023. As noted previously, ***.

Total R&D expenses increased during 2021 through 2023 with most U.S. producers reporting at least some level of R&D expenses. ***, reporting *** R&D expenses, were the exceptions.[42] Directionally, those U.S. producers reporting R&D expenses were, for the most part, uniform in terms of reporting increases in 2022 and 2023. ***, reporting a decline in its R&D expenses in 2023, was the exception.

[40] In 2021 and 2023, relatively large levels of other income partially offset combined interest expense and other expenses. As presented in table III-21, a large share of total other income in 2021 reflects a non-recurring item reported by *** (***). *** U.S. producer questionnaire, sections III-10a-b. In 2023 most of the total other income reported in table III-21 reflects a non-recurring item reported by *** (***). *** U.S. producer questionnaire, sections III-10a-b.

[41] It should be noted that only a small number of U.S. producers reported interest expense (***), other expenses (***), and other income (***). ***, the U.S. producers reporting interest expense, reported increases during 2021 through 2023. ***, in conjunction with ***, accounted for the majority of reported interest expense.

[42] ***. Email with attachment from ***, May 3, 2024.

Table III-23
LPTs: U.S. producers' capital expenditures, by firm and period

Value in 1,000 dollars

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	20,579	27,436	32,604

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Table III-24
LPTs: U.S. producers' narrative descriptions of their capital expenditures, by firm

Firm	Narrative on capital expenditures
Delta Star	***
HD HPT USA	***
Hitachi Energy USA	***
Hyosung HICO	***
PA Transformer	***
Prolec-GE Waukesha	***
Virginia Transformer	***
WEG Transformers	***

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

Table III-25
LPTs: U.S. producers' R&D expenses, by firm and period

Value in 1,000 dollars

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	3,315	4,213	6,113

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Table III-26
LPTs: U.S. producers' narrative descriptions of their R&D expenses, by firm

Firm	Narrative on R&D expenses
Delta Star	***
HD HPT USA	***
Hitachi Energy USA	***
Hyosung HICO	***
PA Transformer	***
Prolec-GE Waukesha	***
Virginia Transformer	***
WEG Transformers	***

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

Assets and return on assets

Table III-27 presents data on the U.S. producers' total net assets and table III-28 presents corresponding ROA.[43] Table III-29 presents U.S. producers' narrative information regarding aspects of reported asset information.

In conjunction with increased sales activity, the pattern of the U.S. industry's overall net assets during 2021 through 2023 is generally consistent with increases in underlying assets such as receivables, inventory (raw material and work in progress),[44] as well as additions to property, plant, and equipment. U.S. producers were, for the most part, uniform in terms of reporting the same directional pattern of increasing total net assets in 2022 and 2023. The exceptions were ***, reporting a decline in total net assets in 2023, and ***, reporting declines in 2022 and 2023.

Table III-27
LPTs: U.S. producers' total net assets, by firm and period

Value in 1,000 dollars

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	548,672	707,932	1,038,412

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

[43] ROA is calculated here as operating results divided by total assets. With regard 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. The ability of U.S. producers to assign total asset values to discrete product lines affects the meaningfulness of calculated operating return on net assets.

[44] As noted previously, U.S. producers manufacture LPTs to order. As such, only a limited amount of finished goods inventory (see table III-16) would generally be reflected as a component of total net assets.

Table III-28
LPTs: U.S. producers' ROA, by firm and period

Ratios in percent

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Table III-29
LPTs: U.S. producers' narrative descriptions of their total net assets, by firm

Firm	Narrative on total assets
Delta Star	***
HD HPT USA	***
Hitachi Energy USA	***
Hyosung HICO	***
PA Transformer	***
Prolec-GE Waukesha	***
Virginia Transformer	***
WEG Transformers	***

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

Part IV: U.S. imports and the foreign industry

U.S. imports

Overview

The Commission issued questionnaires to 60 potential importers of LPTs since 2018. Twelve firms provided data and information in response to the questionnaires, while 14 firms indicated that they had not imported product during the period for which data were collected. Importers' questionnaire data accounted for the substantial majority of U.S. imports of LPTs in 2023 and throughout the period for which data were collected, including all or virtually all imports from South Korea and a large majority of imports from nonsubject sources. In light of the data coverage by the Commission's questionnaires, import data in this report are based on questionnaire responses for LPTs.

Imports from subject and nonsubject countries

Tables IV-1 and IV-2, and figure IV-1 present information on U.S. imports of LPTs from South Korea and all other sources from 2021 through 2023.

Subject imports of LPTs from South Korea decreased by *** percent from 2021 to 2022 before increasing by *** percent in 2023, for a net increase of *** percent, measured by MVA top rated. Imports of LPTs from nonsubject sources increased by *** percent from 2021 to 2022 before decreasing by *** percent in 2023, for a net increase of *** percent measured by MVA top rated. Imports from nonsubject sources consistently accounted for more than ninety percent of total imports, measured by MVA top rated, during 2021-23. Unit values for subject imports were lower than unit values for imports from nonsubject sources in 2021 but higher in 2022 and 2023. As a ratio to U.S. production, U.S. imports of LPTs from all sources exceeded two hundred percent every year during 2021-23, as imports from South Korea ranged from a low of *** percent in 2022 to a high of *** percent in 2023, while imports from nonsubject sources ranged from *** percent in 2021 to *** percent in 2022.

Table IV-1
LPTs: U.S. imports by source and period

Quantity in MVA top rated; value in 1,000 dollars; unit value in dollars per MVA top rated; shares and ratios in percent; ratios represent the ratio to U.S. production

Source	Measure	2021	2022	2023
South Korea	Quantity	***	***	***
Nonsubject sources	Quantity	***	***	***
All import sources	Quantity	101,210	125,793	124,883
South Korea	Value	***	***	***
Nonsubject sources	Value	***	***	***
All import sources	Value	732,777	1,040,085	1,350,061
South Korea	Unit value	***	***	***
Nonsubject sources	Unit value	***	***	***
All import sources	Unit value	7,240	8,268	10,811
South Korea	Share of quantity	***	***	***
Nonsubject sources	Share of quantity	***	***	***
All import sources	Share of quantity	100.0	100.0	100.0
South Korea	Share of value	***	***	***
Nonsubject sources	Share of value	***	***	***
All import sources	Share of value	100.0	100.0	100.0
South Korea	Ratio	***	***	***
Nonsubject sources	Ratio	***	***	***
All import sources	Ratio	203.5	261.1	243.0

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

Figure IV-1
LPTs: U.S. import quantities and average unit values, by source and by period

* * * * * * *

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

Table IV-2
LPTs: Changes in U.S. imports, by source and by period

Quantity in MVA top rated; value in 1,000 dollars; unit values in dollars per MVA top rated; shares and ratios in percent;

Source	Measure	2021	2022	2023
South Korea	Quantity	▲***	▼***	▲***
Nonsubject sources	Quantity	▲***	▲***	▼***
All import sources	Quantity	▲23.4	▲24.3	▼(0.7)
South Korea	Value	▲***	▼***	▲***
Nonsubject sources	Value	▲***	▲***	▲***
All import sources	Value	▲84.2	▲41.9	▲29.8
South Korea	Unit value	▲***	▲***	▲***
Nonsubject sources	Unit value	▲***	▲***	▲***
All import sources	Unit value	▲49.3	▲14.2	▲30.7

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

Table IV-3 presents data on U.S. imports of LPTs from nonsubject sources. The largest nonsubject source of LPT imports in 2023 was Mexico, accounting for *** percent of all U.S. imports of LPTs, followed by imports from the Netherlands and Brazil, accounting for *** percent and *** percent, respectively.

Table IV-3
LPTs: U.S. imports from nonsubject sources, by source and by period

Quantity in MVA top rated; Shares in percent

Source	Measure	2021	2022	2023
Mexico	Quantity	***	***	***
Netherlands	Quantity	***	***	***
Brazil	Quantity	***	***	***
Croatia	Quantity	***	***	***
China	Quantity	***	***	***
Poland	Quantity	***	***	***
Canada	Quantity	***	***	***
All other nonsubject sources	Quantity	***	***	***
Nonsubject sources	Quantity	***	***	***
Mexico	Share of quantity	***	***	***
Netherlands	Share of quantity	***	***	***
Brazil	Share of quantity	***	***	***
Croatia	Share of quantity	***	***	***
China	Share of quantity	***	***	***
Poland	Share of quantity	***	***	***
Canada	Share of quantity	***	***	***
All other nonsubject sources	Share of quantity	***	***	***
Nonsubject sources	Share of quantity	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---". The shares of quantity represent the share of overall U.S. imports from all sources including South Korea, as reported in table IV-1.

The Commission also asked U.S. importers to report their U.S. shipments of U.S.-produced LPTs by top MVA rating during 2021-23. Data for quantity of such U.S. shipments in 2023 are presented in figure IV-2 and are presented in greater detail in Appendix F. For imports of LPTs from all sources, U.S. shipments of imports of LPTs with MVA top rating of 60 to 299 MVA accounted for the largest share of total U.S. shipments, ranging from *** percent during 2021-23, followed by LPTs with MVA top rating of 300 to 499 MVA, LPTs with MVA top rating of 500 to 799 MVA, and LPTs with MVA top rating greater than 800.[1]

Figure IV-2
LPTs: U.S. Importers' U.S. shipments of imports from South Korea and nonsubject sources 2020-23, by top rated MVA

* * * * * * *

Source: Compiled from data submitted in response to Commission questionnaires. The MVA ranges reported in this figure represent the top MVA rating provided to the importers' imports. Detailed data on U.S. importers' U.S. imports by MVA top rating category are shown in Appendix F.

[1] For LPTs with MVA top rating greater than 800, there *** imported from South Korea during 2021-23, ***, which accounted for *** percent share of U.S. shipments of imports from South Korea, measured by MVA top rated. Imports of LPTs with MVA top rating greater than 800 from nonsubject sources (*** units total during 2021-23) accounted for between *** percent and *** percent share of annual U.S. shipments of nonsubject imports, measured by MVA top rated LPT.

U.S. inventories of imported merchandise

U.S. importers did not report any end-of period inventory in any of the period for which the Commission collected data.

U.S. importers' imports subsequent to December 31, 2023

The Commission requested importers to indicate whether they had imported or arranged for the importation of LPTs from South Korea or nonsubject sources for delivery after December 31, 2023. These data are presented in table IV-4. All U.S importers of LPTs from South Korea reported arranged imports from South Korea and five U.S. importers reported arranged imports from nonsubject sources. Compared to 2023 LPT imports, 2024 arranged imports of LPTs from South Korea and nonsubject sources reflect a *** percent increase and a *** percent increase, respectively, representing an overall increase of *** percent.

Table IV-4
LPTs: U.S. importers' arranged imports, by source and period

Quantity in MVA top rated

Source	Jan-Mar 2024	Apr-Jun 2024	Jul-Sept 2024	Oct-Dec 2024	Total
South Korea	***	***	***	***	***
Nonsubject sources	***	***	***	***	***
All import sources	26,150	30,957	38,647	36,488	132,242

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

The industry in South Korea

Overview

During the original investigation, the Commission received questionnaire responses from two producers or exporters of LPTs in South Korea, which were believed to account for virtually all, if not all, of U.S. imports of LPTs in 2011, and approximately 90 percent of LPT exports from South Korea to the United States during 2011.[2]

During the first five-year review, the Commission received foreign producer/exporter questionnaires (or responses to the notice of institution) from four firms —Hyosung, Hyundai, ILJIN, and LS Electric—which accounted for all known production of LPTs in South Korea during 2016, and approximately 95 percent of LPT exports from South Korea to the United States during 2016.[3]

In their responses to the notice of institution for this current review, the respondent interested parties provided a list of the same four firms that may currently produce and/or export LPTs in South Korea: Hyosung Heavy Industries, HD Hyundai Electric, ILJIN, and LS Electric.[4]

Table IV-5 presents the South Korean production, capacity, and exports to the United States of LPTs during 2023 reported by responding producers and exporters in South Korea, as well as data compiled in the original investigation for 2011 and subsequent five-year review for 2017. Reported LPT capacity decreased from 186,636 MVA in 2011 to *** MVA in 2017 and 90,858 MVA in 2023. Similarly, production declined from 136,886 MVA in 2011 to *** MVA in 2017 and 80,627 MVA in 2023. This reflects in part Hyosung Heavy Industries' production in South Korea *** from *** MVA top rated in 2017 to *** in 2023. *** also saw *** from 2017 to 2023, reporting production of *** MVA top rated in 2017 versus *** in 2023. Exports to the United States for all firms decreased from *** MVA top rated in 2017 to *** in 2023, with *** reducing its share of reported exports to the U.S. from *** percent in 2017 to *** percent in 2023.

[2] Original confidential report, p. VII-3.

[3] First review publication, p. IV-3.

[4] Hyosung Heavy Industries' response to the notice of institution, October 2, 2023, exh. 1; Hyundai HD Hyundai Electric's response to the notice of institution, October 2, 2023, p. 4.

Table IV-5
LPTs: South Korean producers' reported production, capacity, and exports to the United States, by period

Quantity in MVA; value in 1,000 dollars; ratio in percent

Item	Measure	2011	2017	2023
Capacity	Quantity	186,636	***	90,858
Production	Quantity	136,886	***	80,627
Capacity utilization	Ratio	73.3	***	88.7
Exports to the United States	Quantity	47,688	***	***
Exports to the United States	Value	---	***	***

Source: For the year 2011, data are compiled using data submitted in the Commission's final investigation. For the year 2017, data are compiled using data submitted in the Commission's first five-year review. For the year 2023, data are compiled from data submitted in response to Commission questionnaires.

Note: In the original investigation and first review, foreign producer questionnaires requested LPT capacity data based on "the level of production that your establishment(s) could reasonably have expected to attain during the specified periods…" and indicated that the reported data should "assume normal operating conditions (i.e., using equipment and machinery in place and ready to operate; normal operating levels ((hours per week/weeks per year) and time for downtime, maintenance, repair, and cleanup; and a typical or representative product mix). Because the foreign producer questionnaire in the first review also collected overall production capacity (for the combination of in-scope and out-of-scope merchandise), it also incorporated the phrase "for all products manufactured in that establishment using the same manufacturing equipment" but added the product mix requirement noted above for LPT capacity.

In this current review, foreign producer questionnaires continued to request LPT capacity data for "the level of production of large power transformers that your establishment(s) could reasonably have expected to attain…over the period …" The definition indicated that the reported data are "based on not only existing capital investments, i.e., machinery and equipment that is in place and ready to operate; but also non-capital investment constraints, such as (1) normal operating conditions, including normal downtime for maintenance, repair, and cleanup; (2) your firm's existing in place and readily available labor force; (3) availability of material inputs; and (4) any other constraints that may have limited your firm's ability to produce the reported products" and also reflect "the portion of practical overall capacity allocated to the production of large power transformers based on the actual product mix experienced over the period" as well as maximum practical production your firm could have achieved "without hiring new personnel or expanding the number of shifts operated in the period."

Table IV-6 presents information on the LPTs operations reported by the responding producers and exporters in South Korea.

Table IV-6
LPTs: Summary data on firms in South Korea, 2023

Firm	Production (MVA top rated)	Share of reported production (percent)	Exports to the United States (MVA top rated)	Share of reported exports to the United States (percent)	Total shipments (MVA top rated)	Share of firm's total shipments exported to the United States (percent)
Hyosung Heavy Industries	***	***	***	***	***	***
ILJIN	***	***	***	***	***	***
HD Hyundai Electric	***	***	***	***	***	***
LS Electric	***	***	***	***	***	***
All firms	80,627	100.0	***	100.0	72,917	***

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

Table IV-7 presents changes experienced by South Korea's industry since January 1, 2018.[5]

[5] For recent developments, if any, in tariff treatment, please see "U.S. tariff treatment" section.

Table IV-7
LPTs: Changes experienced by South Korea's industry since January 1, 2018

Item	Firm	Event
Expansion	HD Hyundai Electric	12/4/2023 – Awarded a **$**59.9 million contract to supply transformers to Santa Clara, California
Expansion	ILJIN	11/27/2023 – Awarded a $333.2 billion contract to supply high-voltage transformers to a U.S. energy company
Expansion	ILJIN	11/20/2023 –Announced plans to build and supply 15 different types of transformers, including 345 kV ones, to the US energy company on the East Coast from 2026 to 2030. The name of the US company is being kept confidential. This is the biggest single order for the company since its inception in 1968, it said, and thanks to it, Iljin Electric's transformer factory will fully run until 2026. The company plans to ramp up its production capacity to deliver the transformers worth 433 billion won in 2026 from 260 billion won in end-2023 on expectations of additional heavy electric equipment orders from the US, with the growth of investments in replacing old energy infrastructure and building new renewable energy power plants under the Inflation Reduction Act and the Infrastructure Investment and Jobs Act
Expansion	LS	10/9/2023 – Awarded contract for the 532 MW Anma Offshore Wind Power Project in South Korea
Expansion	ILJIN	9/8/23 – ILJIN announces a $49 million expansion in its LPT manufacturing plant in Hongseong-gun aimed at meeting demand from overseas markets.
Expansion	HD Hyundai Electric	2020 – Hyundai opened a "smart" LPT factory in Ushan
Layoffs	Hyosung Heavy Industries	5/1/2019 – Hysong began accepting applications for unpaid leave at its LPT factory in Changwon due to a slump in the heavy electric equipment market and warned of rotating leave in the future
Regulations	Argentina	11/22/2019 – Re-imposed antidumping remedies

Sources: Transformers Magazine, "HD Hyundai Electric Wins," December 4, 2023, https://transformers-magazine.com/tm-news/hd-hyundai-electric-wins-us-transformer-order/; Korea Economic Daily,"Iljin Electric bags," November 28, 2023, https://www.kedglobal.com/energy/newsView/ked202311280012; Transformers Magazine, "Iljin Electric's $333 M high-voltage transformer deal in US," November 29, 2023, https://transformers-magazine.com/tm-news/iljin-electrics-333-m-high-voltage-transformer-deal-in-us/; Transformers Magazine, "ANMA selects preferred bidders," October 9, 2023, https://transformers-magazine.com/tm-news/anma-selects-preferred-bidders-for-submarine-cable-contract/; Transformers Magazine, "GE to Finish 1.5," September 2, 2019, https://transformers-magazine.com/tm-news/6850-ge-unit-to-finish-1-5-gw-transmission-project-for-kepco/; World Trade Organization, "Semi-annual Report under Article 16.4 of the Agreement," Argentina, August 10, 2023, https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S005.aspx; World Trade Organization, "Semi-annual Report under Article 16.4 of the Agreement," Canada, August 10, 2023, https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S005.aspx; Kang, "ILJIN Electric Invests KRW 68.2 Billion in Expansion," September 8, 2023, https://www.electimes.com/news/articleView.html?idxno=325683; Ko, "HD Hyundai Electric's Smart Transformer Factory Meets Growing Demand in US, EU," November 9, 2023, https://www.koreatimes.co.kr/www/tech/2024/06/129_362899.html; Kim, "Changwon Large Corporations' Factory Closures, Production Reductions, and Layoffs 'Cold Wind'", May 6, 2019, https://www.knnews.co.kr/news/articleView.php?idxno=1285956.

Note: Sources may refer to merchandise outside of the scope of this review.

Changes in operations

Producers in South Korea were asked to report any change in the character of their operations or organization relating to the production of LPTs since 2018. Three of four producers indicated in their questionnaires that they had experienced such changes. Table IV-8 presents the changes identified by these producers. Table IV-9 presents the anticipated changes identified by two these producers, ***.

Table IV-8
LPTs: Reported changes in operations in South Korea, since January 1, 2018, by firm

Item	Firm name and narrative on changes in operations
Plant openings	***
Production curtailments	***
Weather related or force majeure events	***
Other	***
Other	***

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

Table IV-9
LPTs: Reported anticipated changes in operations in South Korea, since January 1, 2018, by firm

Item	Firm name and narrative on anticipated changes in operations
Anticipated changes in operations	***
Anticipated changes in operations	***

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

Operations on LPTs

Table IV-10 presents data on South Korean producers' installed capacity, practical capacity, and production on the same equipment. From 2021 to 2023, South Korean producers reported increases across each of the assessed measures of capacity, production, and utilization. Installed overall and practical overall capacity increased by 4,480 MVA (3.6 percent) to 129,400 MVA, and by 3,600 MVA (3.4 percent) to 109,167 MVA, respectively. In terms of practical LPT capacity, South Korean producers expanded by 7.8 percent, rising from 84,306 MVA in 2021 to 90,858 MVA in 2023. The industry also reported increases in measures of production. In two years, South Korea's overall production rose by 24,403 MVA (33.0 percent) to 98,343 MVA and its LPT production grew by 24,892 MVA (44.7 percent) to 80,627 MVA. Additionally, South Korean producers reported increasing measures of capacity utilization, with installed overall and practical overall capacity utilization increasing by 16.8 percentage points and by 20.0 percentage points, respectively, from 2021 to 2023. Practical LPT capacity utilization rose more rapidly by 22.6 percentage points.

Table IV-10
LPTs: South Korean producers' installed and practical capacity, production, and utilization, by measure and period

Capacity and production in MVA top rated; utilization in percent

Item	Measure	2021	2022	2023
Installed overall	Capacity	124,920	124,920	129,400
Installed overall	Production	73,940	80,830	98,343
Installed overall	Utilization	59.2	64.7	76.0
Practical overall	Capacity	105,567	105,567	109,167
Practical overall	Production	73,940	80,830	98,343
Practical overall	Utilization	70.0	76.6	90.1
Practical LPT	Capacity	84,306	77,998	90,858
Practical LPT	Production	55,735	59,757	80,627
Practical LPT	Utilization	66.1	76.6	88.7

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Collectively, South Korean producers reported installed overall and practical overall capacity figures lower than the overall production capacity figures reported in the previous review. They attributed this to several developments between the previous and current review, such as an increase in the time it takes to manufacture LPTs, changes in Korean labor laws limiting work hours, workforce reductions, ***, and supply chain challenges.[6] Individually, ILJIN's and LS Electric's overall production capacity reported for 2017 was ***. Hyosung Heavy Industries' overall production capacity reported for 2017 was ***, however the company reported a *** in installed overall capacity of ***

[6] HD Hyundai Electric and Hyosung Heavy Industries ***. HD Hyundai Electric stated that it calculates capacity by including as an input the amount of time it takes to manufacture an LPT, which has increased in recent years and thus has had the effect of reducing capacity. This has been supplemented by the new Korean labor regulations and *** and supply chain challenges with respect to raw materials that further affect production efficiency. Hyosung Heavy Industries also cited the new Korean labor regulations and a decrease in workforce. It stated that ***. Additionally, as reported in its foreign producer questionnaire response, ***. Joint respondents' posthearing brief, pp. 12-18.

MVA from 2020 to 2021 due to the *** of a plant in ***. HD Hyundai Electric's overall production capacity reported for 2017 was ***, a difference that was not directly linked to a change in machinery, equipment, or facilities.

Table IV-11 presents South Korean producers' reported narratives regarding practical capacity constraints.

Table IV-11
LPTs: Reported constraints to practical overall capacity by firms in South Korea

Item	Firm name and narrative on constraints to practical overall capacity
Production bottlenecks	***
Production bottlenecks	***
Production bottlenecks	***
Existing labor force	***
Existing labor force	***
Supply of material inputs	***
Supply of material inputs	***
Other constraints	***

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

Table IV-12 presents data on the LPT industry in South Korea, by item and period. The LPT industry in South Korea experienced a reduction in capacity from 84,306 MVA to 77,998 MVA from 2021 to 2022, and which then increased to 90,858 MVA in 2023. Capacity utilization trended upward from 66.1 percent in 2021 to 88.7 percent in 2023.[7] Home market shipments declined from *** MVA in 2021 to *** MVA in 2023. In contrast, export shipments grew from *** in 2021 to *** MVA in 2023. The *** remains a top export market for South Korean producers, but *** is a larger export market for South Korean producers, as reported in Table IV-14. Hyosung Heavy Industries reported ***. *** have also reported increased sales to the Middle East, where Saudi Arabia has pursued urban infrastructure projects.[8] End-of-period inventories were *** from 2021 to

[7] None of the responding firms reported efficiency gains from technological advancements since January 1, 2018. However, ***. Additionally, ***. Capacity constraints are influenced by regulatory changes, such as a 2018 labor law limiting work hours to 52 per week for factory employees in South Korea, as reported by ***. Supply chain delays for key material inputs have also exacerbated production challenges for ***. ***, though ***.

[8] As shown in tables IV-14 and IV-15, major export destinations include the ***. Reported exports by value to non-U.S. destination markets *** in 2023 (Table IV-15). *** ***. However, ***. *** provided an in-depth explanation of the trends it sees shaping global demand for LPTs. In ***

2022 but *** from 2022 to 2023. The inventory ratio to production *** in 2023. The inventory ratio to total shipments experienced similar trends.[9] After decreasing from *** percent to *** percent from 2021 to 2022, the inventory ratio to total shipments ***, increasing to *** percent in 2023.

Table IV-12
LPTs: Data on industry in South Korea, by item and period

Quantity in MVA top rated; value in 1,000 dollars; unit value in dollars per MVA top rated; ratio and share in percent

Item	Measure	2021	2022	2023
Capacity	Quantity	84,306	77,998	90,858
Production	Quantity	55,735	59,757	80,627
End-of-period inventories	Quantity	***	***	***
Home market shipments	Quantity	***	***	***
Export shipments	Quantity	***	***	***
Total shipments	Quantity	56,007	61,301	72,917
Home market shipments	Value	***	***	***
Export shipments	Value	***	***	***
Total shipments	Value	379,553	476,189	771,274
Home market shipments	Unit value	***	***	***
Export shipments	Unit value	***	***	***
Total shipments	Unit value	6,696	8,036	10,887
Capacity utilization ratio	Ratio	66.1	76.6	88.7
Inventory ratio to production	Ratio	***	***	***
Inventory ratio to total shipments	Ratio	***	***	***
Home market shipments	Share	***	***	***
Export shipments	Share	***	***	***
Total shipments	Share	100.0	100.0	100.0

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Alternative products

As shown in table IV-13, responding firms produced other products on the same equipment and machinery used to produce LPTs. Four out of four firms reported producing out-of-scope transformers below 60 MVA top rated on shared equipment and machinery. *** additionally reported producing reactors on shared equipment and machinery.

[9] Three of four producers reported that LPTs are custom-made and have unique specifications, and that LPTs produced for the home market are not interchangeable with other markets, including the United States.

Table IV-13
LPTs: Producers in South Korea overall production on the same equipment as in-scope production, 2021-2023

Quantity in MVA top rated; share and ratio in percent

Product type	Measure	2021	2022	2023
LPTs	Quantity	55,735	59,757	80,627
Other products	Quantity	18,205	21,073	17,716
All products	Quantity	73,940	80,830	98,343
LPTs	Share	75.4	73.9	82.0
Other products	Share	24.6	26.1	18.0
All products	Share	100.0	100.0	100.0

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

On shared equipment and machinery, production of in-scope transformers comprised the majority of production in South Korea, ranging from as low as 73.9 percent in 2022 to as high as 82.0 percent in calendar year 2023. Of production of LPTs, LPTs under 300 MVA top rated comprised the majority of production from 2021 to 2023, representing a reversal of trends since the first full five-year review. [10]

In the original investigation, *** reported its share of in-scope and out-of-scope merchandise produced on the same equipment as *** percent LPTs and *** percent other products in 2011. During the first review, *** reported its share of in-scope and out-of-scope merchandise produced on the same equipment in 2017 as *** percent LPTs and *** percent other products.

Exports

Table IV-14 shows export data reported by South Korean producers in response to Commission questionnaires. According to these data, *** was the top export market, although the categorization of destination market data varied by producer response. For example, some producers included export destinations in the *** and in the *** market while others included the former two destinations in ***. Exports to non-U.S. destination markets were *** than exports to the United States by quantity and *** by value in 2023. However, the unit value of exports was ***, comparable for ***, and roughly ***. The share of quantity of exports to *** was *** percent in 2023 while the share of quantity of exports to *** was *** percent. Also notable is the trend in

[10] First review publication, p. IV-7.

exports to the United States from 2021 to 2023, where exports decreased from *** MVA top rated in 2021 to *** in 2022 before increasing to *** in 2023.

Table IV-14
LPTs: Producers' exports from South Korea, by destination market and period

Quantity in MVA top rated; value in 1,000 dollars, unit value in dollars per MVA top rated; share in percent

Destination market	Measure	2021	2022	2023
United States	Quantity	***	***	***
Other USMCA countries	Quantity	***	***	***
European Union	Quantity	***	***	***
Asia	Quantity	***	***	***
All other destination markets	Quantity	***	***	***
Non-U.S. destination markets	Quantity	***	***	***
All destination markets	Quantity	***	***	***
United States	Value	***	***	***
Other USMCA countries	Value	***	***	***
European Union	Value	***	***	***
Asia	Value	***	***	***
All other destination markets	Value	***	***	***
Non-U.S. destination markets	Value	***	***	***
All destination markets	Value	***	***	***
United States	Unit value	***	***	***
Other USMCA countries	Unit value	***	***	***
European Union	Unit value	***	***	***
Asia	Unit value	***	***	***
All other destination markets	Unit value	***	***	***
Non-U.S. destination markets	Unit value	***	***	***
All destination markets	Unit value	***	***	***
United States	Share of quantity	***	***	***
Other USMCA countries	Share of quantity	***	***	***
European Union	Share of quantity	***	***	***
Asia	Share of quantity	***	***	***
All other destination markets	Share of quantity	***	***	***
Non-U.S. destination markets	Share of quantity	***	***	***
All destination markets	Share of quantity	***	***	***
United States	Ratio	***	***	***
Other USMCA countries	Ratio	***	***	***
European Union	Ratio	***	***	***
Asia	Ratio	***	***	***
All other destination markets	Ratio	***	***	***
Non-U.S. destination markets	Ratio	***	***	***
All destination markets	Ratio	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---". Ratios represent the portion of the producers' total shipments that are exported by producers and resellers.

The Korea Trade Statistics Promotion Institute (KTSPI) reports that the leading export markets for transformers and parts (broadly defined) from South Korea are the United States, Saudi Arabia, China, and Vietnam (Table IV-15). During 2023, the United States was the top export market for transformers and parts from South Korea, accounting for 30.4 percent, followed by Saudi Arabia, accounting for 17.3 percent.

Table IV-15
Transformers and parts: Exports from South Korea, by destination market and period

Value in 1,000 dollars

Destination market	Measure	2021	2022	2023
United States	Value	147,902	144,232	312,839
Saudi Arabia	Value	60,526	97,538	177,621
China	Value	191,550	150,614	111,461
Vietnam	Value	119,066	128,624	108,896
United Kingdom	Value	10,659	12,878	42,564
Australia	Value	5,946	14,208	27,073
Canada	Value	25,010	36,586	25,579
United Arab Emirates	Value	11,229	169	24,256
Indonesia	Value	10,399	26,229	21,806
All other destination markets	Value	273,396	228,330	176,820
Non-U.S. destination markets	Value	707,784	695,179	716,077
All destination markets	Value	855,686	839,411	1,028,916
United States	Share of value	17.3	17.2	30.4
Saudi Arabia	Share of value	7.1	11.6	17.3
China	Share of value	22.4	17.9	10.8
Vietnam	Share of value	13.9	15.3	10.6
United Kingdom	Share of value	1.2	1.5	4.1
Australia	Share of value	0.7	1.7	2.6
Canada	Share of value	2.9	4.4	2.5
United Arab Emirates	Share of value	1.3	0.0	2.4
Indonesia	Share of value	1.2	3.1	2.1
All other destination markets	Share of value	32.0	27.2	17.2
Non-U.S. destination markets	Share of value	82.7	82.8	69.6
All destination markets	Share of value	100.0	100.0	100.0

Source: Official exports statistics under HS subheading 8504.23 and 8504.90 as reported by KTSPI in the Global Trade Atlas Suite database, accessed April 4, 2024. These data may be overstated as HS subheading 8504.23 may contain products outside the scope of this review.

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---". United States is shown at the top followed by the top exporting countries in descending order of 2021 data.

Third-country trade actions

South Korean producers of LPTs are subject to trade restrictions in two other export markets: Argentina and Canada. On January 2, 2019, Argentina extended an anti-dumping measure against "three-phase liquid dielectric transformers with power greater than 10,000 KVA but not exceeding 600,000 KVA" in HS subheading 8504.23. The measure, which was initially imposed on September 24, 2014, subjects the LPTs to definitive duties.[11]

In July 2023, Canada completed an expiry review pertaining to measures imposed after findings of dumping in July 2017.[12] [13] The investigation determined that the expiry of measures imposed on liquid dielectric transformers having a top power capacity equal to or exceeding 60,000 kilovolt amperes (60 MVA) from South Korea and other countries would be likely to result in the continuation or resumption of dumping of the subject goods and would cause injury to the Canadian domestic industry. In response, Canada has continued to impose the measures.[14]

[11] Argentina's order includes some smaller transformers outside the scope of this review. Domestic Interested Parties' Response to the Notice of Institution, August 2, 2017, page 10, and exhibit 4; and Argentinian Ministry of Justice and Human Rights, Ministerio de Economia y Finanzas Publicas, Resolution 308/2014, July 2, 2014, http://servicios.infoleg.gob.ar/infolegInternet/anexos/235000-239999/235475/norma.htm.

[12] The size of transformers covered in Canada's investigation is the same as the size of transformers covered in the scope of the Commission's original investigation and prior review: Large Power Transformers from Korea, Inv. No. 731-TA-1189 (Final), USITC Publication 4346, August 2012, p. VII-7 and Large Power Transformers from Korea, Inv. *Large Power Transformers from Korea, Inv. No. 731-TA-1189 (First review*), USITC Publication 4826, September 2018, pp. I-10.

[13] Canada imposed anti-dumping measures on the subject good in 2012 and 2017. Canadian International Trade Tribunal (CITT), Dumping and Subsidizing, Findings and Reasons, Inquiry No. NQ-2012-001, Liquid Dielectric Transformers, Finding issued November 20, 2012, Reasons issued December 5, 2012, p. 24, https://decisions.citt-tcce.gc.ca/citt-tcce/a/en/item/353547/index.do; CITT, Dumping and Subsidizing, Findings and Reasons, Expiry Review No. RR-2017-002 Liquid Dielectric Transformers, May 31, 2018, p. 27, https://decisions.citt-tcce.gc.ca/citt-tcce/a/en/item/354871/index.do.

[14] Canadian Border Services Agency (CBSA), "Notice of conclusion of expiry review investigation: Liquid dielectric transformers (TR 2023 ER)," July 13, 2023, https://www.cbsa-asfc.gc.ca/sima-lmsi/er-rre/tr2023/tr2023-nc-eng.html.

Global market

Table IV-16 presents global export data for transformers and parts, a category that includes LPTs and out-of-scope products, by source in descending order of value for 2023. The leading exporters in 2023, by value, were China and South Korea, accounting for 26.1 percent and 10.0 percent of global exports, respectively. The top ten exporters accounted for 74.7 percent of world exports of LPTs in 2023.

Table IV-16
Transformers and parts: Value of exports by country and year (2021-23)

Value in 1,000 dollars; shares in percent

Exporting country	Measure	2021	2022	2023
United States	Value	22,485	39,306	26,792
South Korea	Value	284,211	384,074	683,411
China	Value	892,323	1,062,836	1,786,821
Turkey	Value	302,310	332,659	487,986
Italy	Value	337,561	283,048	390,524
Austria	Value	239,177	241,417	371,272
Germany	Value	262,416	315,660	341,623
Croatia	Value	208,432	243,220	310,056
Mexico	Value	234,348	151,841	286,189
Netherlands	Value	121,073	137,561	250,876
Brazil	Value	118,289	131,310	216,038
Slovenia	Value	120,951	158,401	207,435
All other exporters	Value	1,073,382	941,822	1,497,189
All reporting exporters	Value	4,216,958	4,423,154	6,856,212
United States	Share of value	0.5	0.9	0.4
South Korea	Share of value	6.7	8.7	10.0
China	Share of value	21.2	24.0	26.1
Turkey	Share of value	7.2	7.5	7.1
Italy	Share of value	8.0	6.4	5.7
Austria	Share of value	5.7	5.5	5.4
Germany	Share of value	6.2	7.1	5.0
Croatia	Share of value	4.9	5.5	4.5
Mexico	Share of value	5.6	3.4	4.2
Netherlands	Share of value	2.9	3.1	3.7
Brazil	Share of value	2.8	3.0	3.2
Slovenia	Share of value	2.9	3.6	3.0
All other exporters	Share of value	25.5	21.3	21.8
All reporting exporters	Share of value	100.0	100.0	100.0

Source: Global Trade Information Services, Inc., Global Trade Atlas, HS subheadings 8504.23 and 8504.90 (accessed May 14, 2024). These data may be overstated as HS subheadings 8504.23 and 8504.90 may contain products outside the scope of these reviews.

Note: Because of rounding, figures may not add to total shown. United States is shown at the top followed by the countries under order, all remaining top exporting countries in descending order of 2023 data.

The increasing demands for electricity and sustainability have driven the LPT industry in recent years. From 2017 to 2023, net electricity consumption worldwide rose by 2,808 terawatt-hours (12.4 percent) to 25,530 terawatt-hours.[15] Rapidly industrializing countries have provided LPT manufacturers with attractive markets as well as lower-cost labor and less stringent environmental regulations. As a result, LPT production has shifted to China, Turkey, and Mexico.[16] In 2019, for example, SGB Transformer began full production of cast resin transformers in Changzhou, China.[17]

Global production capacity, consumption, and prices of LPTs are difficult to assess. Factors such as electricity demand, infrastructure development, and market conditions can inform estimates, but precise figures are not readily available. As such, government reports about LPTs refer to a variety of sources, including industry publications and market research.[18] A U.S. Department of Energy report, for example, cites a 2021 Global Market Insights report, "Transformer Market," that the demand for power transformers in 2020 was approximately 12,500 units (of which 4,600 units were 61 MVA) with a value of approximately $29.9 billion. Another source, Research & Markets, estimates that the LPT market was approximately $24.6 billion in 2023, and forecasts it will grow to $38.8 billion by 2030.[19] According to the Government Accounting Office, U.S. utility officials report that LPTs cost several million dollars, and some as much as $10 million.[20] The wide price range is due to factors such as differences in labor and transportation costs, environmental regulations, and sizes and specifications of LPTs.

[15] Enerdata Website, "Total Energy Consumption," https://yearbook.enerdata.net/total-energy/world-consumption-statistics,html (accessed October 19, 2023).

[16] GE Website, "Prolec GE to acquire SPX's Transformer Solutions business," https://www.ge.com/news/press-releases/prolec-ge-to-acquire-spx-transformer-solutions-business.

[17] SGB-SMIT, "Solid Foundation: Prosperous Future . . .", October 1, 2020, https://www.sgb-smit.com/news/news-detail/solid-foundation-prosperous-future-award-for-sgb-china.

[18] Department of Energy, "Electric Grid Supply Chain Review," February 2022, p. 2, https://www.osti.gov/servlets/purl/1871501.

[19] Research & Markets, "Global Large Power Transformer Market," March 2024 (accessed May 12, 2024), https://www.researchandmarkets.com/report/large-power-transformer.

[20] Government Accounting Office, "Electricity Grid: DOE Could Better Support Industry," August 2023, p. 13, https://www.gao.gov/assets/d23106180.pdf.

Part V: Pricing data

Factors affecting prices

Raw material costs

As described in Parts I and III, the major components and raw materials used to produce LPTs include windings, controls and accessories, and grain-oriented electrical steel ("GOES"); other inputs include steel plate and dielectric mineral oil. U.S. producers' raw material costs as a share of the cost of goods sold increased from *** percent in 2021 to *** percent in 2022 and continued to increase to *** percent in 2023.

U.S. producers were divided on trends in raw material prices. During 2018 to 2020, six firms reported that prices have not changed, while two reported that they have steadily increased, and one that they had fluctuated upward. From 2021 to 2023, however, 7 of 9 reporting U.S. producers reported that raw material prices have either fluctuated upward or steadily increased with one producer reporting that there was no change and one producer reporting that raw material prices have decreased. Eight of 9 responding U.S. producers anticipate that raw material prices will steadily increase or continue to fluctuate upward while only one reported anticipating that they will not change.

Firms were asked if the measures on imported steel/aluminum products under section 232 have had an impact on raw material prices on the large power transformers market in the United States, since January 1, 2018 (table V-1). Four U.S. producers responded "no," two responded "yes," and three reported that they "don't know." U.S. producers *** specifically reported that the cost of GOES had increased domestically.

Table V-1
LPTs: Count of firms' responses if section 232 measures on imported steel/aluminum had influence LPTs cost, price, supply, and/or demand, by firm type, since January 1, 2018

Number of firms reporting; "NA" not available

Market	Firm type	Yes	No	Don't know
Impact on the U.S. market from 232 actions	U.S. producers	2	4	3
Impact on the U.S. market from 232 actions	Importers	2	7	3
Impact on the U.S. market from 232 actions	Purchasers	3	1	14
Impact on the U.S. market from 232 actions	Foreign producers	3	0	NA

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

Transportation costs to the U.S. market

Transportation costs for LPTs shipped from South Korea to the United States averaged 5.3 percent during 2023. These estimates were derived from official import data and represent the transportation and other charges on imports.[1]

U.S. inland transportation costs

Seven of 9 responding U.S. producers and 4 of 6 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 2.5 to 10 percent while most responding importers reported costs of 5 to 15 percent.

Pricing practices

Pricing methods

Transaction prices for LPTs are typically determined through bid competition, as discussed later in this section. U.S. producers and importers reported selling LPTs both on single and multiple shipment contracts along with blanket bidding. U.S. producers reported that in 2023, on average, 35.9 percent of their contracts were for a single shipment, 31.7 percent of their contracts were based on bidded blanket/alliance agreement, 19.5 percent of their contracts were based on private blanket/alliance agreement, 9.5 percent of their contracts on multi-shipment bid contracts, and 3.4 percent of their contracts based on private multi-shipment contracts (table V-2). Importers reported that *** percent of 2023 U.S. commercial shipments were for single shipment contracts, *** percent of their contracts were based on blanket/alliance agreement bidding, *** percent of their contracts on multi-shipment bid contracts, and *** percent of their contracts based on private multi-shipment contracts. Most U.S. producers and importers reported that their multiple shipment contracts are for an average of 2 to 4 units.

[1] The estimated transportation costs were obtained by subtracting the customs value from the c.i.f. value of the imports for 2023 and then dividing by the customs value based on the HTS statistical reporting number 8504.23.0045, 8504.23.0080, 8504.90.9634, 8504.90.9638, 8504.90.9642, and 8504.90.9646.

Table V-2
LPTs: U.S. producers' and importers' shares of commercial U.S. shipments by type of sale, 2023

Share in percent

Item	U.S. producers	Subject U.S. importers
Single shipment	35.9	***
Blanket bidding	31.7	***
Blanket private	19.5	***
Multi-shipment bid	9.5	***
Multi-shipment private	3.5	***
Total	100.0	100.0

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

Note: Blanket agreement bidding refers to the procurement process where a buyer establishes a long-term agreement with one or more suppliers to provide LPTs over a specified period, often at predetermined prices or terms. Instead of issuing individual purchase orders for each transaction, the buyer can place orders against the blanket agreement as needed.

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

Note: Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Most purchasers (14 of 17) reported that they do not purchase LPTs on a regular or fixed schedule. LPTs are typically purchased as they are needed, based on projects and existing LPT failures, although some purchasers also have a pre-defined replacement program. Purchaser *** reported that it purchases on a fixed schedule based on its expansion plans which call for new LPTs on a yearly basis, and purchaser *** stated that it schedules orders based on a total of four LPTs per year.

Most purchasers reported contacting between a minimum of three and a maximum of eight LPT suppliers before making a purchase.

Most U.S. producers (5 of 9) reported and five of 12 importers reported that prices can be renegotiated during the contract period. Firms reported that such renegotiations are infrequent with most U.S. producers (7 of 9) and most importers (7 of 10) reporting that renegotiations occur "rarely/never."[2]

Sales terms and discounts

A majority of reporting U.S. producers (5 of 9) and importers (9 of 11) typically quote prices on a delivered basis. Producers and importers generally reported no set discount policy.[3]

[2] The remaining U.S. producers and importers reported "sometimes."
[3] ***.

Long-term supply agreements[4]

Long-term supply arrangements are part of the planning cycle and delivery for LPTs, particularly in their connection with the acquisition of production slots. These agreements help purchasers and suppliers plan and lock in future production capacity along with mitigating the risks associated with high demand and long lead times.[5]

Most U.S. producers (7 of 9) usually (5 firms) or always (2 firms) required to enter a blanket agreement as a condition to bid on a particular project. Two U.S. producers reported that a blanket agreement is "sometimes" or "rarely/never" required as a condition to bid on a particular project. Importers generally reported that they were required to enter blanket agreements a little less often, with *** of 12 reporting "usually," *** reporting "rarely/never," *** reporting "sometimes", and *** reporting "always." Most U.S. producers (7 of 9) and importers (10 of 12) reported that a qualification process is "always" or "usually" required as a condition to bid on a particular project, and the remaining two U.S. producers and *** reported that it is "sometimes" required. *** reported that a qualification process is "rarely/never" required.

Seven of 17 purchasers reported they had purchased LPTs under long-term supply agreements (including blanket agreements, alliance agreements, master contracts, master service agreements, and outline agreements) since January 1, 2021. Six of the 14 purchasers reporting the use of such agreements provided information on their largest such agreements (table V-3 to table V-7).[6] Almost all of the reported blanket purchase agreements did not require the purchaser to buy from the supplier, and in *** of these agreements, the supplier was an exclusive supplier. Such agreements can last for many years, with some reportedly as long as five or more years.

Purchasers that had multiple suppliers for any long-term agreements were asked to describe how they choose which firms will supply their LPT needs over the life of the agreement. Purchaser *** reported that it often has multiple suppliers for the same MVA rating of LPT and that the choice of supplier for a particular order is determined by a multitude of factors such as price, delivery time, factory loading, available slot reservations, and performance. ***, on the other hand, awards specific ratings

[4] Long-term agreements such as blanket agreements are discussed in Part II.

[5] Hearing transcript, p. 67 (Luberda), p. 68 (Wolken).

[6] Although firms were instructed to report information for the five largest agreements, they may have more than five such agreements.

to each supplier under its agreements while maintaining at least one primary and one secondary source for each rating. Purchaser *** stated that the method for choosing suppliers involves qualifying manufacturers by category of transformer, technical specification, and commercial evaluations during sourcing Request for Proposal (RFP) events for contracts. Purchaser *** report that availability of production slots is how they determine which supplier to source from for their LPT needs.

Table V-3
LPTs: U.S. purchaser *'s agreement**

Values in 1,000 dollars

Agreement 1	Supplier	Dates	MVA ranges	Value	Exclusive	Required
Line 1	***	***	***	***	***	***

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

Note: Exclusive indicates if the supplier is an exclusive supplier. Required indicate if purchaser is required to buy from this supplier.

Table V-4
LPTs: U.S. purchaser *'s agreement**

Values in 1,000 dollars

Agreement	Supplier	Dates	MVA ranges	Value	Exclusive	Required
Agreement 1 Line 1	***	***	***	***	***	***
Agreement 1 Line 2	***	***	***	***	***	***
Agreement 1 Line 3	***	***	***	***	***	***
Agreement 1 Line 4	***	***	***	***	***	***
Agreement 2 Line 1	***	***	***	***	***	***
Agreement 2 Line 2	***	***	***	***	***	***
Agreement 2 Line 3	***	***	***	***	***	***
Agreement 2 Line 4	***	***	***	***	***	***
Agreement 3 Line 1	***	***	***	***	***	***
Agreement 3 Line 2	***	***	***	***	***	***
Agreement 3 Line 3	***	***	***	***	***	***
Agreement 4 Line 1	***	***	***	***	***	***
Agreement 4 Line 2	***	***	***	***	***	***
Agreement 4 Line 3	***	***	***	***	***	***
Agreement 4 Line 4	***	***	***	***	***	***
Agreement 5 Line 1	***	***	***	***	***	***
Agreement 5 Line 2	***	***	***	***	***	***
Agreement 5 Line 3	***	***	***	***	***	***
Agreement 5 Line 4	***	***	***	***	***	***

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

Note: Exclusive indicates if the supplier is an exclusive supplier. Required indicate if purchaser is required to buy from this supplier.

Note: Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Table V-5
LPTs: U.S. purchaser *'s agreement**

Values in 1,000 dollars

Agreement	Supplier	Dates	MVA ranges	Value	Exclusive	Required
Agreement 1 Line 1	***	***	***	***	***	***
Agreement 2 Line 1	***	***	***	***	***	***
Agreement 3 Line 1	***	***	***	***	***	***
Agreement 4 Line 1	***	***	***	***	***	***
Agreement 5 Line 1	***	***	***	***	***	***

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

Note: Exclusive indicates if the supplier is an exclusive supplier. Required indicate if purchaser is required to buy from this supplier.

Note: Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Table V-6
LPTs: U.S. purchaser *'s agreement**

Values in 1,000 dollars

Agreement	Supplier	Dates	MVA ranges	Value	Exclusive	Required
Agreement 1 Line 1	***	***	***	***	***	***
Agreement 2 Line 1	***	***	***	***	***	***
Agreement 3 Line 1	***	***	***	***	***	***
Agreement 3 Line 1	***	***	***	***	***	***
Agreement 4 Line 1	***	***	***	***	***	***
Agreement 5 Line 1	***	***	***	***	***	***

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

Note: Exclusive indicates if the supplier is an exclusive supplier. Required indicate if purchaser is required to buy from this supplier.

Note: Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Table V-7
LPTs: U.S. purchaser *'s agreement**

Values in 1,000 dollars

Agreement	Supplier	Dates	MVA ranges	Value	Exclusive	Required
Agreement 1 Line 1	***	***	***	***	***	***
Agreement 2 Line 1	***	***	***	***	***	***
Agreement 3 Line 1	***	***	***	***	***	***

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

Note: Exclusive indicates if the supplier is an exclusive supplier. Required indicate if purchaser is required to buy from this supplier.

Note: Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Table V-8
LPTs: U.S. purchaser *'s agreement**

Values in 1,000 dollars

Agreement	Supplier	Dates	MVA ranges	Value	Exclusive	Required
Agreement 1 Line 1	***	***	***	***	***	***
Agreement 1 Line 2	***	***	***	***	***	***
Agreement 1 Line 3	***	***	***	***	***	***
Agreement 2 Line 1	***	***	***	***	***	***
Agreement 2 Line 2	***	***	***	***	***	***

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

Note: Exclusive indicates if the supplier is an exclusive supplier. Required indicate if purchaser is required to buy from this supplier.

Note: Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Initial versus evaluated costs

Suppliers typically provide a base price (the initial price including delivery and installation) and a total evaluated price (the base price plus the losses over the expected life of the transformer).[7]

Purchasers were asked to rate how they weigh the initial LPT purchase cost compared with the evaluated/lifetime cost of owning the LPTs, including maintenance cost, evaluated loss, and other operational costs (table V-9). Most purchasers (12 of 15 reporting) "mostly consider initial cost" or "consider initial and evaluated/lifetime cost equally." Three firms

[7] *Large Power Transformers from Korea, Inv. No. 731-TA-1189 (Review)*, USITC Publication 4826, August 2018, p. V-8.

mostly consider initial/evaluated costs, and two firms "only" considered/evaluated initial costs, and no firm considers only initial costs.

Table V-9
LPTs: Importance of initial versus evaluated/lifetime cost

Number of firms reporting

Only consider initial cost	Only consider initial cost	Mostly consider initial cost	Consider initial and evaluated/ lifetime cost equally	Mostly consider evaluated/ lifetime cost	Only consider evaluated/ lifetime cost
Balancing initial vs evaluated cost	***	***	***	***	***

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

Note: Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Planned projects and renewal agreements

Purchasers were asked to identify any new projects that are planned or likely to be placed for bid in 2024 or 2025 and any blanket agreements that are likely to be renewed or placed for bid in 2024 or 2025. Eleven firms provided such information (table V-10).

Table V-10
LPTs: New projects and blanket agreements, 2024-25

Purchaser	Range of MVA sizes	Estimated units	Anticipated bid/renewal date	Locations
***	***	***	***	***
***	***	***	***	***
***	***	***	***	***
***	***	***	***	***
***	***	***	***	***
***	***	***	***	***
***	***	***	***	***
***	***	***	***	***
***	***	***	***	***
***	***	***	***	***
***	***	***	***	***
***	***	***	***	***
***	***	***	***	***
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***	***	***	***	***
***	***	***	***	***
***	***	***	***	***
***	***	***	***	***
***	***	***	***	***
***	***	***	***	***
***	***	***	***	***
***	***	***	***	***
***	***	***	***	***
***	***	***	***	***
***	***	***	***	***

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

Price leadership

Most purchasers did not identify any price leaders in the U.S. LPT market. Of the four purchasers that listed price leaders, the following firms were named: GE Prolec Waukesia (3 purchasers), Siemens (2), Hyosung HICO (1), HD HPT USA (1), and SGB-SMIT Sales (1).

Purchaser *** stated that GE Prolec, Siemens Energy, Hitachi, Hyosung HICO, and HD HPT USA have unique buying power with suppliers. As a result, their materials are not directly related to commodity pricing; they have internal deals with suppliers to give them better and more stable pricing. Purchaser *** reported that Prolec GE Waukesha is one of the top producers of power transformers. Purchaser *** reports that Siemens owns a large market share and has transformer factories all over the world.

Bid process

Ten of 17 purchasers indicated that they did not attend a pre-bid meeting with a potential supplier. Of the firms that reported that they attended pre-bid meetings, most of these firms reported that the discussion focuses on the RFP and technical specifications and that pricing is not discussed during pre-bid meetings. Almost all responding U.S. producers (8 of 9) and importers (11 of 12)[8] reported that bids for LPTs also include other services, including: installation services, maintenance, offloading services, field and parts assembly, freight, supply of insulation oil, supervision for installation, testing, transportation, and warranty services.

Most (13 of 17) purchasers reported that their purchases generally involve negotiations with suppliers. Items negotiated include evaluating proposals on cancellation terms, commercial and technical merits, determining key contract terms, ensuring specification requirements, negotiating supply agreements, negotiating warranty, indemnity, limitation of liability, and insurance. Purchaser *** stated that it typically sources and negotiates 5-year supply agreements for transformers and negotiates terms for each purchase order. Purchaser *** reported that it focuses on key contract terms, including price, delivery schedule, and damages, during its negotiations. *** stated that it negotiates with respect to storage, payment, safe harbor components, cancellation, and quality assurance/quality control. Purchaser *** reported that it makes most of its LPT purchases under blanket agreements. Its typical negotiation points include price, price adjustment methodology, terms and conditions, delivery, and payment structure. Purchasers *** attempt to negotiate prices down or receive agreed-upon volume discounts before deciding on contract award during significant sourcing RFP events for long-term contract awards, and *** negotiates on a few factors such as warranty, indemnity, limitation of liability, and insurance. Purchaser *** stated that for a less frequent supplier it may negotiate cancellation terms, payment milestones, parent guarantees, liquidated damages.

[8] Importer *** reported that it is not involved in bidding process.

In most cases, suppliers only have one opportunity to bid on a particular contract. Three of 9 U.S. producers and 4 of 12 importers reported that there is "sometimes" more than one opportunity to bid on a particular sales agreement. Five U.S. producers and six importers reported "rarely/never," and one U.S. producer and two importers reported that there is "usually" more than one opportunity to bid. Among purchasers, 12 of 16 responding purchasers indicated that they "rarely/never" allow or request suppliers to bid on a particular sales agreement more than once, and three purchasers indicated that they "sometimes" allow more than one chance to bid on a particular sales agreement. Purchaser *** stated that bids would only be re-opened if no bidders responded or if there was an issue with the approved supplier not being able to meet the specifications during the design review. For purchasers *** delayed projects, changing project timelines, design changes, and a volatile market may allow suppliers to rebid on a contract for the same opportunity.

Three of 9 U.S. producers reported that purchasers "sometimes" discuss the bids of competing firms with them in order to get a lower bid price, one reported that they "usually" do, and five U.S. producers report that they "rarely/never" do. Four of 12 responding importers reported that purchasers "sometimes" discuss with them the bids of competing firms in order to get a lower bid price, one reported that they "usually" do, and seven reported that they "rarely/never" do.

Almost all purchasers, 13 of 15, reported that they generally do not quote competing prices during negotiations. Firms that do so generally reported that they provide an explanation to their suppliers but not the actual prices. For example, purchasers may let the unsuccessful firm know that they lost due to pricing, technical disqualification, or lead times, without disclosing the pricing or other terms of the winning bid.

Eight of 17 purchasers reported that they had attended a post-bid meeting with a supplier that bid on, but was not awarded, the project. Firms were then asked to describe post-bid discussions and whether there were discussions of bids, pricing, and the reason for awards. Purchasers generally indicated that they will often provide general feedback to suppliers regarding whether the supplier was competitive on price, technical issues, and lead times. However, purchasers generally stated that they do not discuss specific pricing details including disclosing the prices of the supplier that was awarded the project.[9]

[9] For example, *** does not share scorecards or evaluations in a competitive bid. However, it may provide very high-level feedback on the area in which contributed to the bidder's lower score on the weighted evaluation scorecard. However, it does not provide pricing, a percentage, or any other pricing data that may put them in breach of their confidentiality provisions. *** discuss general reasons with

(*continued*...)

Purchasers were asked how general pricing information became known in the U.S. market. *** stated that they gather pricing information through general feedback. Purchaser *** obtains information on pricing through direct discussions with suppliers and anecdotal evidence. Similarly, purchaser *** relies on feedback specific to a supplier's proposal. *** reported it gathers pricing information through regular bi-weekly discussions with vendors, and *** tracks and reports major commodity inputs from various sources to determine market price. *** reported it obtains general pricing information from the Procurement Transformer Market Research Reports, which serve as a reliable source of market intelligence. *** reported that it shares bid tabs with vendors, making them aware of where their quotes were in relation to other quotes, while *** leverages procurement using cost intelligence tools to analyze markets along with their competitive bid process to understand pricing. Purchaser *** reports that they regularly bid out smaller MVA units to suppliers in the U.S. market providing them the opportunity to monitor domestic cost fluctuations, while *** obtains general pricing information through quoting, networking, and the use of consultants.

Bid data

The Commission requested U.S. purchasers to provide information regarding the number of projects for bid since January 1, 2021. Two responding purchasers reported bid data for 655 projects during this period. Of these 655 projects, 655 had bids from domestic producers, 634 had bids from South Korean suppliers, and 336 had bids from nonsubject country suppliers.

Three of the 17 responding purchasers reported that they had projects for which a domestic producer and a South Korean supplier bid. There were 634 such projects. Purchasers were requested to provide the bid data for their five largest bid purchases of LPTs since January 1, 2021, involving at least one bid from a U.S. producer and one from a South Korean firm. Two purchasers provided such bid data for their top five bidding events.[10]

The bid information for *** and *** are shown in tables V-11 to V-30.

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bidders for not awarding a contract, such as pricing, lead time, and inability to meet design requirements, and may provide a numerical rank (i.e., 4 out of 8 suppliers).

[10] Purchasers *** provided usable bid data. Purchaser *** reported that they had projects for both domestic producer and South Korean supplier bids but did not provide bid data due to confidentiality concerns. Purchaser *** provided bid data that was submitted after the hearing and inadvertently not included in the staff report (see Appendix H).

Table V-11
LPTs: U.S. purchaser *'s bid event 1 requirements**

Bid data; Event 1	Bid requirements
Bid end date	***
Base MVA	***
Top MVA	***
Load loss evaluation—dollars per kW	***
Number of units	***
High line kV	***
No load loss evaluation—dollars per kW	***
Winding BIL	***

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

Table V-12
LPTs: U.S. purchaser *'s bid event 1 received offers**

Value and cost in 1,000 dollars

Bid offer	Firm name	Country	Base value	Limited to LPTs	Evaluated cost	Winning bid	Explanation
Bid 1	***	***	***	***	***	***	***
Bid 2	***	***	***	***	***	***	***
Bid 3	***	***	***	***	***	***	***
Bid 4	***	***	***	***	***	***	***
Bid 5	***	***	***	***	***	***	***

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

Note: Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Table V-13
LPTs: U.S. purchaser *'s bid event 2 requirements**

Bid data; Event 2	Bid requirements
Bid end date	***
Base MVA	***
Top MVA	***
Load loss evaluation—dollars per kW	***
Number of units	***
High line kV	***
No load loss evaluation—dollars per kW	***
Winding BIL	***

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

Table V-14
LPTs: U.S. purchaser *'s bid event 2 received offers**

Value and cost in 1,000 dollars

Bid offer	Firm name	Country	Base value	Limited to LPTs	Evaluated cost	Winning bid	Explanation
Bid 1	***	***	***	***	***	***	***
Bid 2	***	***	***	***	***	***	***
Bid 3	***	***	***	***	***	***	***
Bid 4	***	***	***	***	***	***	***
Bid 5	***	***	***	***	***	***	***

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

Table V-15
LPTs: U.S. purchaser *'s bid event 3 requirements**

Bid data; Event 3	Bid requirements
Bid end date	***
Base MVA	***
Top MVA	***
Load loss evaluation—dollars per kW	***
Number of units	***
High line kV	***
No load loss evaluation—dollars per kW	***
Winding BIL	***

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

Table V-16
LPTs: U.S. purchaser *'s bid event 3 received offers**

Value and cost in 1,000 dollars

Bid offer	Firm name	Country	Base value	Limited to LPTs	Evaluated cost	Winning bid	Explanation
Bid 1	***	***	***	***	***	***	***
Bid 2	***	***	***	***	***	***	***
Bid 3	***	***	***	***	***	***	***
Bid 4	***	***	***	***	***	***	***
Bid 5	***	***	***	***	***	***	***

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

Table V-17
LPTs: U.S. purchaser *'s bid event 4 requirements**

Bid data; Event 4	Bid requirements
Bid end date	***
Base MVA	***
Top MVA	***
Load loss evaluation—dollars per kW	***
Number of units	***
High line kV	***
No load loss evaluation—dollars per kW	***
Winding BIL	***

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

Table V-18
LPTs: U.S. purchaser *'s bid event 4 received offers**

Value and cost in 1,000 dollars

Bid offer	Firm name	Country	Base value	Limited to LPTs	Evaluated cost	Winning bid	Explanation
Bid 1	***	***	***	***	***	***	***
Bid 2	***	***	***	***	***	***	***
Bid 3	***	***	***	***	***	***	***

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

Table V-19
LPTs: U.S. purchaser *'s bid event 5 requirements**

Bid data; Event 5	Bid requirements
Bid end date	***
Base MVA	***
Top MVA	***
Load loss evaluation—dollars per kW	***
Number of units	***
High line kV	***
No load loss evaluation—dollars per kW	***
Winding BIL	***

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

Table V-20
LPTs: U.S. purchaser *'s bid event 5 received offers**

Value and cost in 1,000 dollars

Bid offer	Firm name	Country	Base value	Limited to LPTs	Evaluated cost	Winning bid	Explanation
Bid 1	***	***	***	***	***	***	***
Bid 2	***	***	***	***	***	***	***

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

Table V-21
LPTs: U.S. purchaser *'s bid event 1 requirements**

Bid data; Event 1	Bid requirements
Bid end date	***
Base MVA	***
Top MVA	***
Load loss evaluation--dollars per kW	***
Number of units	***
High line kV	***
No load loss evaluation--dollars per kW	***
Winding BIL	***

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

Table V-22
LPTs: U.S. purchaser *'s bid event 1 received offers**

Value and cost in 1,000 dollars

Bid offer	Firm name	Country	Base value	Limited to LPTs	Evaluated cost	Winning bid	Explanation
Bid 1	***	***	***	***	***	***	***
Bid 2	***	***	***	***	***	***	***
Bid 3	***	***	***	***	***	***	***

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

Note: Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Table V-23
LPTs: U.S. purchaser *'s bid event 2 requirements**

Bid data; Event 2	Bid requirements
Bid end date	***
Base MVA	***
Top MVA	***
Load loss evaluation--dollars per kW	***
Number of units	***
High line kV	***
No load loss evaluation--dollars per kW	***
Winding BIL	***

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

Table V-24
LPTs: U.S. purchaser *'s bid event 2 received offers**

Value and cost in 1,000 dollars

Bid offer	Firm name	Country	Base value	Limited to LPTs	Evaluated cost	Winning bid	Explanation
Bid 1	***	***	***	***	***	***	***
Bid 2	***	***	***	***	***	***	***
Bid 3	***	***	***	***	***	***	***

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

Note: Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Table V-25
LPTs: U.S. purchaser *'s bid event 3 requirements**

Bid data; Event 3	Bid requirements
Bid end date	***
Base MVA	***
Top MVA	***
Load loss evaluation--dollars per kW	***
Number of units	***
High line kV	***
No load loss evaluation--dollars per kW	***
Winding BIL	***

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

Table V-26
LPTs: U.S. purchaser *'s bid event 3 received offers**

Value and cost in 1,000 dollars

Bid offer	Firm name	Country	Base value	Limited to LPTs	Evaluated cost	Winning bid	Explanation
Bid 1	***	***	***	***	***	***	***
Bid 2	***	***	***	***	***	***	***
Bid 3	***	***	***	***	***	***	***

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

Note: Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Table V-27
LPTs: U.S. purchaser *'s bid event 4 requirements**

Bid data; Event 4	Bid requirements
Bid end date	***
Base MVA	***
Top MVA	***
Load loss evaluation--dollars per kW	***
Number of units	***
High line kV	***
No load loss evaluation--dollars per kW	***
Winding BIL	***

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

Table V-28
LPTs: U.S. purchaser *'s bid event 4 received offers**

Value and cost in 1,000 dollars

Bid offer	Firm name	Country	Base value	Limited to LPTs	Evaluated cost	Winning bid	Explanation
Bid 1	***	***	***	***	***	***	***
Bid 2	***	***	***	***	***	***	***
Bid 3	***	***	***	***	***	***	***

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

Note: Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Table V-29
LPTs: U.S. purchaser *'s bid event 5 requirements**

Bid data; Event 5	Bid requirements
Bid end date	***
Base MVA	***
Top MVA	***
Load loss evaluation--dollars per kW	***
Number of units	***
High line kV	***
No load loss evaluation--dollars per kW	***
Winding BIL	***

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

Table V-30
LPTs: U.S. purchaser *'s bid event 5 received offers**

Value and cost in 1,000 dollars

Bid offer	Firm name	Country	Base value	Limited to LPTs	Evaluated cost	Winning bid	Explanation
Bid 1	***	***	***	***	***	***	***
Bid 2	***	***	***	***	***	***	***
Bid 2	***	***	***	***	***	***	***

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

Note: Zeroes, null values, and undefined calculations are suppressed and shown as "---".

A U.S. producer was the winning bidder in only one of the top 10 bid events reported by the two purchasers. A South Korean supplier was the winner in 8 of the top 10 reported bidding instances.[11] In the eight instances in which South Korean suppliers won part or all of the bid, purchasers gave the following reasons: lowest evaluated bidder; lowest cost supplier; total ownership evaluation including commercial and technical evaluation; U.S. supplier not being the best overall bid for project; and lead time.

[11] Of the two instances that the South Korean supplier lost, it lost once to a U.S. producer and once to a supplier from Germany.

Purchasers' perceptions of relative price trends

Purchasers were asked how the prices of LPTs from the United States had changed relative to the prices of LPTs from South Korea since 2018. Seven of 12 reporting purchasers reported that prices of U.S.-produced LPTs and imported LPTs from South Korea had changed by the same amount. Six purchasers reported that domestic prices were higher compared to prices of South Korean product.

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
88 FR 60496, September 1, 2023	*Large Power Transformers From South Korea; Institution of a Five-Year Review*	https://www.govinfo.gov/content/pkg/FR-2023-09-01/pdf/2023-18731.pdf
88 FR 60438, September 1, 2023	*Initiation of Five-Year (Sunset) Reviews*	https://www.govinfo.gov/content/pkg/FR-2023-09-01/pdf/2023-18957.pdf
88 FR 87457, December 18, 2023	*Large Power Transformers From South Korea; Notice of Commission Determination To Conduct a Full Five-Year Review*	https://www.govinfo.gov/content/pkg/FR-2023-12-18/pdf/2023-27657.pdf
89 FR 330, January 3, 2024	*Large Power Transformers From the Republic of Korea: Final Results of the Expedited Second Sunset Review of the Antidumping Duty Order*	https://www.govinfo.gov/content/pkg/FR-2024-01-03/pdf/2023-28946.pdf
89 FR 12379, February 16, 2024	*Large Power Transformers From South Korea; Scheduling of a Full Five-Year Review*	https://www.govinfo.gov/content/pkg/FR-2024-02-16/pdf/2024-03246.pdf

APPENDIX B

LIST OF HEARING WITNESSES

CALENDAR OF PUBLIC HEARING

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

Subject: Large Power Transformers from South Korea

Inv. No.: 731-TA-1189 (Second Review)

Date and Time: June 20, 2024 - 9:30 a.m.

Sessions were held in connection with this review in the Main Hearing Room (Room 101), 500 E Street, SW., Washington, DC.

OPENING REMARKS:

In Support of Continuation (**R. Alan Luberda**, Kelley Drye & Warren LLP)
In Opposition to Continuation (**Lynn M. Fischer Fox**, Arnold & Porter Kaye Scholer LLP)

In Support of the Continuation of the Antidumping Duty Order:

Kelley Drye & Warren LLP
Washington, DC
on behalf of

Hitachi Energy USA Inc., Prolec GE Waukesha, Inc.,
Delta Star, Inc., Pennsylvania
Transformer Technology, LLC
(collectively "Domestic Industry")

Douglas Wolken, Director, Commercial Operations, Power Transformers, NAM, Hitachi Energy USA Inc.

Jared Delello, Pricing and Government Relations Manager, Delta Star, Inc.

Luke Schweng, Commercial Director for Power Transformers, Prolec GE Waukesha, Inc.

Sandeep Chakravarty, President, Pennsylvania Transformer Technology, LLC

Gina Beck, Economic Consultant, Georgetown Economic Services

In Support of the Continuation of the
Antidumping Duty Order (continued):

Michael Kerwin, Assistant Director, Georgetown Economic Services

R. Alan Luberda)
Kathleen W. Cannon)
) – OF COUNSEL
Melissa M. Brewer)
Matthew Martin)

In Opposition to the Continuation of the
Antidumping Duty Order:

White & Case LLP
Washington, DC
on behalf of

HD Hyundai Electric Co., Ltd. ("HDHE")
HD Hyundai Electric America Corporation ("HD HEA")
(collectively, "Hyundai")

Sungsoo (Justin) Kang, Head of Overseas Sales Division, HDHE

Jun Kang, Head of Overseas Sales Department II, HDHE

Chang-gon Son, President, HD Hyundai Power Transformers USA ("HD HPT")

David E. Bond)
) – OF COUNSEL
Ron Kendler)

Arnold & Porter Kaye Scholer LLP
Washington, DC
on behalf of

Hyosung Heavy Industries Corporation ("HHIC"),
Hyosung HICO, Ltd. ("Hyosung HICO")
HD Hyundai Electric America Corporation ("HD HEA")
(collectively, "Hyosung")

Byung Chan Ahn, Senior Manager, Hyosung HICO

In Opposition to the Continuation of the
Antidumping Duty Order (continuation):

Jason Neal, President, Hyosung HICO; Senior Executive Vice President, HICO America

Vincent Chiodo, Vice President Sales, Marketing & Application Engineering, HICO America

Alex Ebbert, Managing Director Product Lines, HICO America

Jim P. Dougan, Partner, ION Economics

Jerrie Mirga, Director, ION Economics

J. David Park)
Lynn M. Fischer Fox) – OF COUNSEL
Gina M. Colarusso)

REBUTTAL/CLOSING REMARKS:

In Support of Continuation (**Kathleen W. Cannon**, Kelley Drye & Warren LLP)
In Opposition to Continuation (**Ron Kendler**, White & Case LLP)

APPENDIX C

SUMMARY DATA

Table C-1
LPTs: Summary data concerning the U.S. market, by item and period
Quantity=MVA top rated; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per MVA top rate; Period changes=percent--exceptions noted

Item	Reported data			Period changes		
	Calendar year			Calendar year		
	2021	2022	2023	2021-23	2021-22	2022-23
U.S. consumption quantity:						
Amount	148,271	177,627	175,750	▲18.5	▲19.8	▼(1.1)
Producers' share (fn1)	32.5	30.0	29.2	▼(3.3)	▼(2.5)	▼(0.9)
Importers' share (fn1):						
South Korea	***	***	***	▲***	▼***	▲***
Nonsubject sources	***	***	***	▲***	▲***	▼***
All import sources	67.5	70.0	70.8	▲3.3	▲2.5	▲0.9
U.S. consumption value:						
Amount	1,168,623	1,598,276	2,082,238	▲78.2	▲36.8	▲30.3
Producers' share (fn1)	38.4	35.8	35.7	▼(2.7)	▼(2.6)	▼(0.1)
Importers' share (fn1):						
South Korea	***	***	***	▲***	▼***	▲***
Nonsubject sources	***	***	***	▼***	▲***	▼***
All import sources	61.6	64.2	64.3	▲2.7	▲2.6	▲0.1
U.S. importers' U.S. shipments of imports from:						
South Korea:						
Quantity	***	***	***	▲***	▼***	▲***
Value	***	***	***	▲***	▼***	▲***
Unit value	***	***	***	▲***	▲***	▼***
Ending inventory quantity	***	***	***	***	***	***
Nonsubject sources:						
Quantity	***	***	***	▲***	▲***	▼***
Value	***	***	***	▲***	▲***	▲***
Unit value	***	***	***	▲***	▲***	▲***
Ending inventory quantity	***	***	***	***	***	***
All import sources:						
Quantity	100,080	124,260	124,483	▲24.4	▲24.2	▲0.2
Value	719,546	1,025,688	1,338,763	▲86.1	▲42.5	▲30.5
Unit value	$7,190	$8,254	$10,755	▲49.6	▲14.8	▲30.3
Ending inventory quantity	---	---	---	---	---	---
U.S. producers':						
Practical capacity quantity	58,870	61,758	66,174	▲12.4	▲4.9	▲7.2
Production quantity	49,724	48,178	51,398	▲3.4	▼(3.1)	▲6.7
Capacity utilization (fn1)	84.5	78.0	77.7	▼(6.8)	▼(6.5)	▼(0.3)
U.S. shipments:						
Quantity	48,191	53,367	51,267	▲6.4	▲10.7	▼(3.9)
Value	449,077	572,588	743,475	▲65.6	▲27.5	▲29.8
Unit value	$9,319	$10,729	$14,502	▲55.6	▲15.1	▲35.2
Export shipments:						
Quantity	***	***	***	▼***	▼***	***
Value	***	***	***	▼***	▼***	***
Unit value	***	***	***	▼***	▼***	***

Table continued.

Table C-1 Continued
LPTs: Summary data concerning the U.S. market, by item and period
Quantity=MVA top rated; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per MVA top rate; Period changes=percent--exceptions noted

Item	Reported data			Period changes		
	Calendar year			Calendar year		
	2021	2022	2023	2021-23	2021-22	2022-23
U.S. producers':--Continued.						
Ending inventory quantity	***	***	***	▼***	▼***	▲***
Inventories/total shipments (fn1)	***	***	***	▼***	▼***	▲***
Production workers	1,232	1,397	1,686	▲36.9	▲13.4	▲20.7
Hours worked (1,000s)	2,584	2,963	3,542	▲37.1	▲14.7	▲19.5
Wages paid ($1,000)	74,150	93,176	118,217	▲59.4	▲25.7	▲26.9
Hourly wages (dollars per hour)	$28.70	$31.45	$33.38	▲16.3	▲9.6	▲6.1
Productivity (MVA top rated per 1,000 hours)	19.2	16.3	14.5	▼(24.6)	▼(15.5)	▼(10.8)
Unit labor costs	$1,491	$1,934	$2,300	▲54.2	▲29.7	▲18.9
Net sales:						
Quantity	***	***	***	▲***	▲***	▼***
Value	***	***	***	▲***	▲***	▲***
Unit value	***	***	***	▲***	▲***	▲***
Cost of goods sold (COGS)	***	***	***	▲***	▲***	▲***
Gross profit or (loss) (fn2)	***	***	***	▲***	▲***	▲***
SG&A expenses	***	***	***	▲***	▲***	▲***
Operating income or (loss) (fn2)	***	***	***	▲***	▲***	▲***
Net income or (loss) (fn2)	***	***	***	▲***	▲***	▲***
Unit COGS	***	***	***	▲***	▲***	▲***
Unit SG&A expenses	***	***	***	▲***	▲***	▲***
Unit operating income or (loss) (fn2)	***	***	***	▲***	▲***	▲***
Unit net income or (loss) (fn2)	***	***	***	▲***	▲***	▲***
COGS/sales (fn1)	***	***	***	▼***	▼***	▼***
Operating income or (loss)/sales (fn1)	***	***	***	▲***	▲***	▲***
Net income or (loss)/sales (fn1)	***	***	***	▲***	▲***	▲***
Capital expenditures	20,579	27,436	32,604	▲58.4	▲33.3	▲18.8
Research and development expenses	3,315	4,213	6,113	▲84.4	▲27.1	▲45.1
Total assets	$548,672	$707,932	$1,038,412	▲89.3	▲29.0	▲46.7

Source: Compiled from data submitted in response to Commission questionnaires. 508 compliant tables for these data are contained in Parts I, III, and IV of this report.

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.

HISTORICAL DATA

Table C-1
Large power transformers: Summary data concerning the U.S. market, 2015-17, January to March 2017, and January to March 2018

(Quantity=MVA top rated; Value=1,000 dollars; Unit values, unit labor costs, and unit expenses=dollars per MVA top rated; Period changes=percent--exceptions noted)

	Reported data					Period changes			
	Calendar year			January-March					
	2015	2016	2017	2017	2018	2015-17	2015-16	2016-17	Jan-Mar 2017-18
U.S. consumption quantity:									
Amount	***	***	***	***	***	***	***	***	***
Producers' share (fn1)	***	***	***	***	***	***	***	***	***
Importers' share (fn1):									
Korea	***	***	***	***	***	***	***	***	***
Nonsubject sources	***	***	***	***	***	***	***	***	***
All import sources	***	***	***	***	***	***	***	***	***
U.S. consumption value:									
Amount	***	***	***	***	***	***	***	***	***
Producers' share (fn1)	***	***	***	***	***	***	***	***	***
Importers' share (fn1):									
Korea	***	***	***	***	***	***	***	***	***
Nonsubject sources	***	***	***	***	***	***	***	***	***
All import sources	***	***	***	***	***	***	***	***	***
U.S. importers' U.S. shipments of imports from.--									
Korea:									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***	***	***	***
Nonsubject sources:									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***	***	***	***
All import sources:									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***	***	***	***
U.S. producers':									
Average capacity quantity	***	***	***	***	***	***	***	***	***
Production quantity	***	***	***	***	***	***	***	***	***
Capacity utilization (fn1)	***	***	***	***	***	***	***	***	***
U.S. shipments:									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Export shipments:									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***	***	***	***
Inventories/total shipments (fn1)	***	***	***	***	***	***	***	***	***
Production workers	***	***	***	***	***	***	***	***	***
Hours worked (1,000s)	***	***	***	***	***	***	***	***	***
Wages paid ($1,000)	***	***	***	***	***	***	***	***	***
Hourly wages	***	***	***	***	***	***	***	***	***
Productivity (MVA top rated per 1,000 hours)	***	***	***	***	***	***	***	***	***
Unit labor costs	***	***	***	***	***	***	***	***	***
Net sales:									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Cost of goods sold (COGS)	***	***	***	***	***	***	***	***	***
Gross profit of (loss)	***	***	***	***	***	***	***	***	***
SG&A expenses	***	***	***	***	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***	***	***	***	***
Net income or (loss)	***	***	***	***	***	***	***	***	***
Capital expenditures	***	***	***	***	***	***	***	***	***
Unit COGS	***	***	***	***	***	***	***	***	***
Unit SG&A expenses	***	***	***	***	***	***	***	***	***
Unit operating income or (loss)	***	***	***	***	***	***	***	***	***
Unit net income or (loss)	***	***	***	***	***	***	***	***	***
COGS/sales (fn1)	***	***	***	***	***	***	***	***	***
Operating income or (loss)/sales (fn1)	***	***	***	***	***	***	***	***	***
Net income or (loss)/sales (fn1)	***	***	***	***	***	***	***	***	***

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

fn1.--Reported data are in percent and period changes are in percentage points.
fn2.--Undefined.

Source: Compiled from data provided in response to Commission questionnaire.

In the original investigation, Petitioners and Respondent Hyosung agreed that volume expressed in MVA (rather than value) was the most reasonable basis for measuring apparent U.S. consumption and market share.[1] Therefore, tables in historical appendix C present apparent U.S. consumption and market share on the basis of quantity only. To address certain firms' reporting of inventories, which were actually finished units in transit; imports (rather than shipments of imports) from subject and non-subject sources were used to calculate apparent U.S. consumption. Table C-2 presented the U.S. market for all LPTs, using top-rated MVAs as a measure of quantity, while table C-3 used units of LPTs as a measure of quantity.

[1] Petitioners' posthearing brief, Answers to Commission questions, p. 82; Respondent Hyosung's posthearing brief, p. 4.

Table C-2
LPTs: Summary data (using top rated MVA as quantity) concerning the U.S. market, 2009-11, January-March 2011, and January-March 2012

(Quantity=MVA, value=1,000 dollars, unit values, unit labor costs, and unit expenses are per MVA; period changes=percent, except where noted)

	Reported data					Period changes			
				January-March					Jan.-March
Item	2009	2010	2011	2011	2012	2009-11	2009-10	2010-11	2011-12
U.S. consumption quantity:									
Amount	112,219	111,383	137,243	29,009	26,245	22.3	-0.7	23.2	-9.5
Producers' share (1)	17.6	17.0	16.1	15.3	17.9	-1.5	-0.6	-0.9	2.6
Importers' share (1):									
Korea	***	***	***	***	***	***	***	***	***
All other sources	***	***	***	***	***	***	***	***	***
Total imports	82.4	83.0	83.9	84.7	82.1	1.5	0.6	0.9	-2.6
U.S. imports from:									
Korea:									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***	***	***	***
All other sources:									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***	***	***	***
All sources:									
Quantity	92,465	92,485	115,177	24,582	21,554	24.6	0.0	24.5	-12.3
Value	813,330	766,644	845,310	178,950	141,285	3.9	-5.7	10.3	-21.0
Unit value	$8,796	$8,289	$7,339	$7,280	$6,555	-16.6	-5.8	-11.5	-10.0
Ending inventory quantity	8,586	5,948	12,611	5,626	11,741	46.9	-30.7	112.0	108.7
U.S. producers':									
Average capacity quantity	43,346	50,200	59,439	14,632	19,168	37.1	15.8	18.4	31.0
Production quantity	20,469	19,426	24,049	4,706	6,448	17.5	-5.1	23.8	37.0
Capacity utilization (1)	47.2	38.7	40.5	32.2	33.6	-6.8	-8.5	1.8	1.5
U.S. shipments:									
Quantity	19,754	18,898	22,066	4,427	4,691	11.7	-4.3	16.8	6.0
Value	276,436	211,558	207,349	45,747	47,952	-25.0	-23.5	-2.0	4.8
Unit value	$13,994	$11,195	$9,397	$10,334	$10,222	-32.9	-20.0	-16.1	-1.1
Export shipments:									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***	***	***	***
Inventories/total shipments (1)	***	***	***	***	***	***	***	***	***
Production workers	***	***	***	***	***	***	***	***	***
Hours worked (1,000s)	***	***	***	***	***	***	***	***	***
Wages paid ($1,000s)	***	***	***	***	***	***	***	***	***
Hourly wages	***	***	***	***	***	***	***	***	***
Productivity (MVA/1,000 hours)	***	***	***	***	***	***	***	***	***
Unit labor costs	***	***	***	***	***	***	***	***	***
Net sales:									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Cost of goods sold (COGS)	***	***	***	***	***	***	***	***	***
Gross profit or (loss)	***	***	***	***	***	***	***	***	***
SG&A expenses	***	***	***	***	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***	***	***	***	***
Capital expenditures	***	***	***	***	***	***	***	***	***
Unit COGS	***	***	***	***	***	***	***	***	***
Unit SG&A expenses	***	***	***	***	***	***	***	***	***
Unit operating income or (loss)	***	***	***	***	***	***	***	***	***
COGS/sales (1)	***	***	***	***	***	***	***	***	***
Operating income or (loss)/ sales (1)	***	***	***	***	***	***	***	***	***

(1) "Reported data" are in percent and "period changes" are in percentage points.
(2) Not applicable.

Note.--Financial data are reported on a fiscal year basis and may not necessarily be comparable to data reported on a calendar year basis. Because of rounding, figures may not add to the totals shown. Unit values and shares are calculated from the unrounded figures.

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

Table C-3
LPTs: Summary data (using units of LPTs as quantity) concerning the U.S. market, 2009-11, January-March 2011, and January-March 2012

(Quantity=units, value=1,000 dollars, unit values, unit labor costs, and unit expenses are per unit; period changes=percent, except where noted)

	Reported data					Period changes			
				January-March					Jan.-March
Item	2009	2010	2011	2011	2012	2009-11	2009-10	2010-11	2011-12
U.S. consumption quantity:									
Amount	568	513	622	126	114	9.5	-9.7	21.2	-9.5
Producers' share (1)	30.3	27.7	25.6	27.0	30.7	-4.7	-2.6	-2.1	3.7
Importers' share (1):									
Korea	***	***	***	***	***	***	***	***	***
All other sources	***	***	***	***	***	***	***	***	***
Total imports	69.7	72.3	74.4	73.0	69.3	4.7	2.6	2.1	-3.7
U.S. imports from:									
Korea:									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***	***	***	***
All other sources:									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***	***	***	***
All sources:									
Quantity	396	371	463	92	79	16.9	-6.3	24.8	-14.1
Value	813,330	766,644	845,310	178,950	141,285	3.9	-5.7	10.3	-21.0
Unit value	$2,053,864	$2,066,426	$1,825,724	$1,945,109	$1,788,418	-11.1	0.6	-11.6	-8.1
Ending inventory quantity	39	21	42	22	33	7.7	-46.2	100.0	50.0
U.S. producers':									
Average capacity quantity	508	475	499	121	144	-1.8	-6.5	5.1	19.0
Production quantity	177	147	175	35	45	-1.1	-16.9	19.0	28.6
Capacity utilization (1)	34.8	30.9	35.1	28.9	31.3	0.2	-3.9	4.1	2.3
U.S. shipments:									
Quantity	172	142	159	34	35	-7.6	-17.4	12.0	2.9
Value	276,436	211,558	207,349	45,747	47,952	-25.0	-23.5	-2.0	4.8
Unit value	$1,607,186	$1,489,845	$1,304,082	$1,345,500	$1,370,057	-18.9	-7.3	-12.5	1.8
Export shipments:									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Ending inventory quantity	***	***	***	***	***	***	***	***	***
Inventories/total shipments (1)	***	***	***	***	***	***	***	***	***
Production workers	***	***	***	***	***	***	***	***	***
Hours worked (1,000s)	***	***	***	***	***	***	***	***	***
Wages paid ($1,000s)	***	***	***	***	***	***	***	***	***
Hourly wages	***	***	***	***	***	***	***	***	***
Productivity (units/1,000 hours)	***	***	***	***	***	***	***	***	***
Unit labor costs	***	***	***	***	***	***	***	***	***
Net sales:									
Quantity	***	***	***	***	***	***	***	***	***
Value	***	***	***	***	***	***	***	***	***
Unit value	***	***	***	***	***	***	***	***	***
Cost of goods sold (COGS)	***	***	***	***	***	***	***	***	***
Gross profit or (loss)	***	***	***	***	***	***	***	***	***
SG&A expenses	***	***	***	***	***	***	***	***	***
Operating income or (loss)	***	***	***	***	***	***	***	***	***
Capital expenditures	***	***	***	***	***	***	***	***	***
Unit COGS	***	***	***	***	***	***	***	***	***
Unit SG&A expenses	***	***	***	***	***	***	***	***	***
Unit operating income or (loss)	***	***	***	***	***	***	***	***	***
COGS/sales (1)	***	***	***	***	***	***	***	***	***
Operating income or (loss)/ sales (1)	***	***	***	***	***	***	***	***	***

(1) "Reported data" are in percent and "period changes" are in percentage points.
(2) Not applicable.

Note.--Financial data are reported on a fiscal year basis and may not necessarily be comparable to data reported on a calendar year basis. Because of rounding, figures may not add to the totals shown. Unit values and shares are calculated from the unrounded figures.

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

APPENDIX D

COMMENTS ON EFFECTS OF THE ORDER AND LIKELY EFFECTS OF REVOCATION

Table D-1
LPTs: Firms' narratives on the impact of the orders and the likely impact of revocation

Response type	Firm type	Firm name and narrative on impact or likely impact
Effect of order	U.S. producers	***
Effect of order	U.S. producers	***
Effect of order	U.S. producers	***
Effect of order	U.S. producers	***
Effect of order	U.S. producers	***
Effect of order	U.S. producers	***

Table Continued.

Table D-1 Continued
LPTs: Firms' narratives on the impact of the order(s) and the likely impact of revocation

Response type	Firm type	Firm name and narrative on impact or likely impact
Effect of order	U.S. producers	***
Effect of order	U.S. producers	***.
Effect of order	U.S. producers	***
Likely impact of revocation	U.S. producers	***
Likely impact of revocation	U.S. producers	***
Likely impact of revocation	U.S. producers	***
Likely impact of revocation	U.S. producers	***
Likely impact of revocation	U.S. producers	***
Likely impact of revocation	U.S. producers	***
Likely impact of revocation	U.S. producers	***.
Likely impact of revocation	U.S. producers	***
Effect of order	Importers	***
Effect of order	Importers	***

Table Continued.

Table D-1 Continued
LPTs: Firms' narratives on the impact of the order(s) and the likely impact of revocation

Response type	Firm type	Firm name and narrative on impact or likely impact
Effect of order	Importers	***
Effect of order	Importers	***
Effect of order	Importers	***
Effect of order	Importers	***

Table Continued.

Table D-1 Continued
LPTs: Firms' narratives on the impact of the order(s) and the likely impact of revocation

Response type	Firm type	Firm name and narrative on impact or likely impact
Effect of order	Importers	***
Effect of order	Importers	***
Effect of order	Importers	***
Effect of order	Importers	***
Likely impact of revocation	Importers	***
Likely impact of revocation	Importers	***
Likely impact of revocation	Importers	***
Likely impact of revocation	Importers	***
Likely impact of revocation	Importers	***

Table Continued.

Table D-1 Continued
LPTs: Firms' narratives on the impact of the order(s) and the likely impact of revocation

Response type	Firm type	Firm name and narrative on impact or likely impact
Likely impact of revocation	Importers	***
Likely impact of revocation	Importers	***
Likely impact of revocation	Importers	***
Effect of order	Purchasers	***
Effect of order	Purchasers	***
Effect of order	Purchasers	***
Effect of order	Purchasers	***
Effect of order	Purchasers	***
Effect of order	Purchasers	***
Effect of order	Purchasers	***
Effect of order	Purchasers	***
Effect of order	Purchasers	***
Likely impact of revocation	Purchasers	***
Likely impact of revocation	Purchasers	***
Likely impact of revocation	Purchasers	***
Likely impact of revocation	Purchasers	***
Likely impact of revocation	Purchasers	***
Likely impact of revocation	Purchasers	***

Table Continued.

Table D-1 Continued
LPTs: Firms' narratives on the impact of the order(s) and the likely impact of revocation

Response type	Firm type	Firm name and narrative on impact or likely impact
Likely impact of revocation	Purchasers	***
Likely impact of revocation	Purchasers	***
Likely impact of revocation	Purchasers	***
Effect of order	Foreign producers	***
Effect of order	Foreign producers	***
Effect of order	Foreign producers	***

Table Continued.

Table D-1 Continued
LPTs: Firms' narratives on the impact of the order(s) and the likely impact of revocation

Response type	Firm type	Firm name and narrative on impact or likely impact
Likely impact of revocation	Foreign producers	***
Likely impact of revocation	Foreign producers	***

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

APPENDIX E

COVID-19 IMPACT NARRATIVE RESPONSES

Table E-1

LPTs: Firms' narratives on the impact of COVID-19

Firm type	Firm name and narrative on COVID-19 impact
U.S. producers	***
U.S. producers	***
U.S. producers	***
U.S. producers	***
U.S. producers	***
U.S. producers	***
U.S. producers	***
Importers	***
Importers	***
Importers	***
Importers	***
Importers	***
Foreign producers	***

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

APPENDIX F

LPT SHIPMENTS BY CATEGORY AND QUANTITY MEASURE

Table F-1

LPTs: U.S. producers' U.S. shipments by MVA top rated category and period

Quantity in MVA top rated or in units as noted in table; Value in 1,000 dollars; Unit values in dollars per MVA top rate or in dollars per unit as noted in table; Shares and ratios in percent

Product type	Measure	2021	2022	2023
60-299 MVA top rated	Quantity: MVA top rating	***	***	***
300-499 MVA top rated	Quantity: MVA top rating	***	***	***
500-799 MVA top rated	Quantity: MVA top rating	***	***	***
800+ MVA top rated	Quantity: MVA top rating	***	***	***
All MVA top rated categories	Quantity: MVA top rating	48,191	53,367	51,267
60-299 MVA top rated	Quantity: units	***	***	***
300-499 MVA top rated	Quantity: units	***	***	***
500-799 MVA top rated	Quantity: units	***	***	***
800+ MVA top rated	Quantity: units	***	***	***
All MVA top rated categories	Quantity: units	291	326	383
60-299 MVA top rated	Value	***	***	***
300-499 MVA top rated	Value	***	***	***
500-799 MVA top rated	Value	***	***	***
800+ MVA top rated	Value	***	***	***
All MVA top rated categories	Value	449,077	572,588	743,475
60-299 MVA top rated	Unit value: Dollars per MVA top rating	***	***	***
300-499 MVA top rated	Unit value: Dollars per MVA top rating	***	***	***
500-799 MVA top rated	Unit value: Dollars per MVA top rating	***	***	***
800+ MVA top rated	Unit value: Dollars per MVA top rating	***	***	***
All MVA top rated categories	Unit value: Dollars per MVA top rating	9,319	10,729	14,502
60-299 MVA top rated	Unit value: Dollars per unit	***	***	***
300-499 MVA top rated	Unit value: Dollars per unit	***	***	***
500-799 MVA top rated	Unit value: Dollars per unit	***	***	***
800+ MVA top rated	Unit value: Dollars per unit	***	***	***
All MVA top rated categories	Unit value: Dollars per unit	1,543,220	1,756,405	1,941,188

Table continued.

Table F-1 Continued

LPTs: U.S. producers' U.S. shipments by MVA top rated category and period

Shares in percent; ratio in MVA top rated per unit

Product type	Measure	2021	2022	2023
60-299 MVA top rated	Share of quantity: MVA top rating	***	***	***
300-499 MVA top rated	Share of quantity: MVA top rating	***	***	***
500-799 MVA top rated	Share of quantity: MVA top rating	***	***	***
800+ MVA top rated	Share of quantity: MVA top rating	***	***	***
All MVA top rated categories	Share of quantity: MVA top rating	100.0	100.0	100.0
60-299 MVA top rated	Share of quantity: units	***	***	***
300-499 MVA top rated	Share of quantity: units	***	***	***
500-799 MVA top rated	Share of quantity: units	***	***	***
800+ MVA top rated	Share of quantity: units	***	***	***
All MVA top rated categories	Share of quantity: units	100.0	100.0	100.0
60-299 MVA top rated	Share of value	***	***	***
300-499 MVA top rated	Share of value	***	***	***
500-799 MVA top rated	Share of value	***	***	***
800+ MVA top rated	Share of value	***	***	***
All MVA top rated categories	Share of value	100.0	100.0	100.0
60-299 MVA top rated	Ratio: average MVA per unit	***	***	***
300-499 MVA top rated	Ratio: average MVA per unit	***	***	***
500-799 MVA top rated	Ratio: average MVA per unit	***	***	***
800+ MVA top rated	Ratio: average MVA per unit	***	***	***
All MVA top rated categories	Ratio: average MVA per unit	166	164	134

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“.

Table F-2

LPTs: U.S. importers' U.S. shipments of imports from South Korea, by MVA top rated category and period

Quantity in MVA top rated or in units as noted in table; Value in 1,000 dollars; Unit values in dollars per MVA top rate or in dollars per unit as noted in table; Shares and ratios in percent

Product type	Measure	2021	2022	2023
60-299 MVA top rated	Quantity: MVA top rating	***	***	***
300-499 MVA top rated	Quantity: MVA top rating	***	***	***
500-799 MVA top rated	Quantity: MVA top rating	***	***	***
800+ MVA top rated	Quantity: MVA top rating	***	***	***
All MVA top rated categories	Quantity: MVA top rating	***	***	***
60-299 MVA top rated	Quantity: units	***	***	***
300-499 MVA top rated	Quantity: units	***	***	***
500-799 MVA top rated	Quantity: units	***	***	***
800+ MVA top rated	Quantity: units	***	***	***
All MVA top rated categories	Quantity: units	***	***	***
60-299 MVA top rated	Value	***	***	***
300-499 MVA top rated	Value	***	***	***
500-799 MVA top rated	Value	***	***	***
800+ MVA top rated	Value	***	***	***
All MVA top rated categories	Value	***	***	***
60-299 MVA top rated	Unit value: Dollars per MVA top rating	***	***	***
300-499 MVA top rated	Unit value: Dollars per MVA top rating	***	***	***
500-799 MVA top rated	Unit value: Dollars per MVA top rating	***	***	***
800+ MVA top rated	Unit value: Dollars per MVA top rating	***	***	***
All MVA top rated categories	Unit value: Dollars per MVA top rating	***	***	***
60-299 MVA top rated	Unit value: Dollars per unit	***	***	***
300-499 MVA top rated	Unit value: Dollars per unit	***	***	***
500-799 MVA top rated	Unit value: Dollars per unit	***	***	***
800+ MVA top rated	Unit value: Dollars per unit	***	***	***
All MVA top rated categories	Unit value: Dollars per unit	***	***	***

Table continued.

Table F-2 Continued

LPTs: U.S. importers' U.S. shipments of imports from South Korea, by MVA top rated category and period

Shares in percent; ratio in MVA top rated per unit

Product type	Measure	2021	2022	2023
60-299 MVA top rated	Share of quantity: MVA top rating	***	***	***
300-499 MVA top rated	Share of quantity: MVA top rating	***	***	***
500-799 MVA top rated	Share of quantity: MVA top rating	***	***	***
800+ MVA top rated	Share of quantity: MVA top rating	***	***	***
All MVA top rated categories	Share of quantity: MVA top rating	100.0	100.0	100.0
60-299 MVA top rated	Share of quantity: units	***	***	***
300-499 MVA top rated	Share of quantity: units	***	***	***
500-799 MVA top rated	Share of quantity: units	***	***	***
800+ MVA top rated	Share of quantity: units	***	***	***
All MVA top rated categories	Share of quantity: units	100.0	100.0	100.0
60-299 MVA top rated	Share of value	***	***	***
300-499 MVA top rated	Share of value	***	***	***
500-799 MVA top rated	Share of value	***	***	***
800+ MVA top rated	Share of value	***	***	***
All MVA top rated categories	Share of value	100.0	100.0	100.0
60-299 MVA top rated	Ratio: average MVA per unit	***	***	***
300-499 MVA top rated	Ratio: average MVA per unit	***	***	***
500-799 MVA top rated	Ratio: average MVA per unit	***	***	***
800+ MVA top rated	Ratio: average MVA per unit	***	***	***
All MVA top rated categories	Ratio: average MVA per unit	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“.

Table F-3

LPTs: U.S. importers' U.S. shipments of imports from nonsubject sources, by MVA top rated category and period

Quantity in MVA top rated or in units as noted in table; Value in 1,000 dollars; Unit values in dollars per MVA top rate or in dollars per unit as noted in table; Shares and ratios in percent

Product type	Measure	2021	2022	2023
60-299 MVA top rated	Quantity: MVA top rating	***	***	***
300-499 MVA top rated	Quantity: MVA top rating	***	***	***
500-799 MVA top rated	Quantity: MVA top rating	***	***	***
800+ MVA top rated	Quantity: MVA top rating	***	***	***
All MVA top rated categories	Quantity: MVA top rating	***	***	***
60-299 MVA top rated	Quantity: units	***	***	***
300-499 MVA top rated	Quantity: units	***	***	***
500-799 MVA top rated	Quantity: units	***	***	***
800+ MVA top rated	Quantity: units	***	***	***
All MVA top rated categories	Quantity: units	***	***	***
60-299 MVA top rated	Value	***	***	***
300-499 MVA top rated	Value	***	***	***
500-799 MVA top rated	Value	***	***	***
800+ MVA top rated	Value	***	***	***
All MVA top rated categories	Value	***	***	***
60-299 MVA top rated	Unit value: Dollars per MVA top rating	***	***	***
300-499 MVA top rated	Unit value: Dollars per MVA top rating	***	***	***
500-799 MVA top rated	Unit value: Dollars per MVA top rating	***	***	***
800+ MVA top rated	Unit value: Dollars per MVA top rating	***	***	***
All MVA top rated categories	Unit value: Dollars per MVA top rating	***	***	***
60-299 MVA top rated	Unit value: Dollars per unit	***	***	***
300-499 MVA top rated	Unit value: Dollars per unit	***	***	***
500-799 MVA top rated	Unit value: Dollars per unit	***	***	***
800+ MVA top rated	Unit value: Dollars per unit	***	***	***
All MVA top rated categories	Unit value: Dollars per unit	***	***	***

Table continued.

Table F-3 Continued

LPTs: U.S. importers' U.S. shipments of imports from nonsubject sources, by MVA top rated category and period

Shares in percent; ratio in MVA top rated per unit

Product type	Measure	2021	2022	2023
60-299 MVA top rated	Share of quantity: MVA top rating	***	***	***
300-499 MVA top rated	Share of quantity: MVA top rating	***	***	***
500-799 MVA top rated	Share of quantity: MVA top rating	***	***	***
800+ MVA top rated	Share of quantity: MVA top rating	***	***	***
All MVA top rated categories	Share of quantity: MVA top rating	100.0	100.0	100.0
60-299 MVA top rated	Share of quantity: units	***	***	***
300-499 MVA top rated	Share of quantity: units	***	***	***
500-799 MVA top rated	Share of quantity: units	***	***	***
800+ MVA top rated	Share of quantity: units	***	***	***
All MVA top rated categories	Share of quantity: units	100.0	100.0	100.0
60-299 MVA top rated	Share of value	***	***	***
300-499 MVA top rated	Share of value	***	***	***
500-799 MVA top rated	Share of value	***	***	***
800+ MVA top rated	Share of value	***	***	***
All MVA top rated categories	Share of value	100.0	100.0	100.0
60-299 MVA top rated	Ratio: average MVA per unit	***	***	***
300-499 MVA top rated	Ratio: average MVA per unit	***	***	***
500-799 MVA top rated	Ratio: average MVA per unit	***	***	***
800+ MVA top rated	Ratio: average MVA per unit	***	***	***
All MVA top rated categories	Ratio: average MVA per unit	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“.

Table F-4

LPTs: U.S. importers' U.S. shipments of imports from all import sources, by MVA top rated category and period

Quantity in MVA top rated or in units as noted in table; Value in 1,000 dollars; Unit values in dollars per MVA top rate or in dollars per unit as noted in table; Shares and ratios in percent

Product type	Measure	2021	2022	2023
60-299 MVA top rated	Quantity: MVA top rating	***	***	***
300-499 MVA top rated	Quantity: MVA top rating	***	***	***
500-799 MVA top rated	Quantity: MVA top rating	***	***	***
800+ MVA top rated	Quantity: MVA top rating	***	***	***
All MVA top rated categories	Quantity: MVA top rating	100,080	124,260	124,483
60-299 MVA top rated	Quantity: units	***	***	***
300-499 MVA top rated	Quantity: units	***	***	***
500-799 MVA top rated	Quantity: units	***	***	***
800+ MVA top rated	Quantity: units	***	***	***
All MVA top rated categories	Quantity: units	486	582	603
60-299 MVA top rated	Value	***	***	***
300-499 MVA top rated	Value	***	***	***
500-799 MVA top rated	Value	***	***	***
800+ MVA top rated	Value	***	***	***
All MVA top rated categories	Value	719,546	1,025,687	1,338,763
60-299 MVA top rated	Unit value: Dollars per MVA top rating	***	***	***
300-499 MVA top rated	Unit value: Dollars per MVA top rating	***	***	***
500-799 MVA top rated	Unit value: Dollars per MVA top rating	***	***	***
800+ MVA top rated	Unit value: Dollars per MVA top rating	***	***	***
All MVA top rated categories	Unit value: Dollars per MVA top rating	7,190	8,254	10,755
60-299 MVA top rated	Unit value: Dollars per unit	***	***	***
300-499 MVA top rated	Unit value: Dollars per unit	***	***	***
500-799 MVA top rated	Unit value: Dollars per unit	***	***	***
800+ MVA top rated	Unit value: Dollars per unit	***	***	***
All MVA top rated categories	Unit value: Dollars per unit	1,480,547	1,762,349	2,220,171

Table continued.

Table F-4 Continued

LPTs: U.S. importers' U.S. shipments of imports from all import sources, by MVA top rated category and period

Shares in percent; ratio in MVA top rated per unit

Product type	Measure	2021	2022	2023
60-299 MVA top rated	Share of quantity: MVA top rating	***	***	***
300-499 MVA top rated	Share of quantity: MVA top rating	***	***	***
500-799 MVA top rated	Share of quantity: MVA top rating	***	***	***
800+ MVA top rated	Share of quantity: MVA top rating	***	***	***
All MVA top rated categories	Share of quantity: MVA top rating	100.0	100.0	100.0
60-299 MVA top rated	Share of quantity: units	***	***	***
300-499 MVA top rated	Share of quantity: units	***	***	***
500-799 MVA top rated	Share of quantity: units	***	***	***
800+ MVA top rated	Share of quantity: units	***	***	***
All MVA top rated categories	Share of quantity: units	100.0	100.0	100.0
60-299 MVA top rated	Share of value	***	***	***
300-499 MVA top rated	Share of value	***	***	***
500-799 MVA top rated	Share of value	***	***	***
800+ MVA top rated	Share of value	***	***	***
All MVA top rated categories	Share of value	100.0	100.0	100.0
60-299 MVA top rated	Ratio: average MVA per unit	***	***	***
300-499 MVA top rated	Ratio: average MVA per unit	***	***	***
500-799 MVA top rated	Ratio: average MVA per unit	***	***	***
800+ MVA top rated	Ratio: average MVA per unit	***	***	***
All MVA top rated categories	Ratio: average MVA per unit	206	214	206

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“.

Table F-5

LPTs: U.S. producers' U.S. shipments and U.S. importers' U.S. shipments of imports from all sources combined, by MVA top rated category and period

Quantity in MVA top rated or in units as noted in table; Value in 1,000 dollars; Unit values in dollars per MVA top rate or in dollars per unit as noted in table; Shares and ratios in percent

Product type	Measure	2021	2022	2023
60-299 MVA top rated	Quantity: MVA top rating	***	***	***
300-499 MVA top rated	Quantity: MVA top rating	***	***	***
500-799 MVA top rated	Quantity: MVA top rating	***	***	***
800+ MVA top rated	Quantity: MVA top rating	***	***	***
All MVA top rated categories	Quantity: MVA top rating	148,271	177,627	175,750
60-299 MVA top rated	Quantity: units	***	***	***
300-499 MVA top rated	Quantity: units	***	***	***
500-799 MVA top rated	Quantity: units	***	***	***
800+ MVA top rated	Quantity: units	***	***	***
All MVA top rated categories	Quantity: units	777	908	986
60-299 MVA top rated	Value	***	***	***
300-499 MVA top rated	Value	***	***	***
500-799 MVA top rated	Value	***	***	***
800+ MVA top rated	Value	***	***	***
All MVA top rated categories	Value	1,168,623	1,598,275	2,082,238
60-299 MVA top rated	Unit value: Dollars per MVA top rating	***	***	***
300-499 MVA top rated	Unit value: Dollars per MVA top rating	***	***	***
500-799 MVA top rated	Unit value: Dollars per MVA top rating	***	***	***
800+ MVA top rated	Unit value: Dollars per MVA top rating	***	***	***
All MVA top rated categories	Unit value: Dollars per MVA top rating	7,882	8,998	11,848
60-299 MVA top rated	Unit value: Dollars per unit	***	***	***
300-499 MVA top rated	Unit value: Dollars per unit	***	***	***
500-799 MVA top rated	Unit value: Dollars per unit	***	***	***
800+ MVA top rated	Unit value: Dollars per unit	***	***	***
All MVA top rated categories	Unit value: Dollars per unit	1,504,019	1,760,215	2,111,803

Table continued.

Table F-5 Continued

LPTs: U.S. producers' U.S. shipments and U.S. importers' U.S. shipments of imports from all sources combined, by MVA top rated category and period

Shares in percent; ratio in MVA top rated per unit

Product type	Measure	2021	2022	2023
60-299 MVA top rated	Share of quantity: MVA top rating	***	***	***
300-499 MVA top rated	Share of quantity: MVA top rating	***	***	***
500-799 MVA top rated	Share of quantity: MVA top rating	***	***	***
800+ MVA top rated	Share of quantity: MVA top rating	***	***	***
All MVA top rated categories	Share of quantity: MVA top rating	100.0	100.0	100.0
60-299 MVA top rated	Share of quantity: units	***	***	***
300-499 MVA top rated	Share of quantity: units	***	***	***
500-799 MVA top rated	Share of quantity: units	***	***	***
800+ MVA top rated	Share of quantity: units	***	***	***
All MVA top rated categories	Share of quantity: units	100.0	100.0	100.0
60-299 MVA top rated	Share of value	***	***	***
300-499 MVA top rated	Share of value	***	***	***
500-799 MVA top rated	Share of value	***	***	***
800+ MVA top rated	Share of value	***	***	***
All MVA top rated categories	Share of value	100.0	100.0	100.0
60-299 MVA top rated	Ratio: average MVA per unit	***	***	***
300-499 MVA top rated	Ratio: average MVA per unit	***	***	***
500-799 MVA top rated	Ratio: average MVA per unit	***	***	***
800+ MVA top rated	Ratio: average MVA per unit	***	***	***
All MVA top rated categories	Ratio: average MVA per unit	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“.

Table F-6

LPTs: Producers' in South Korea total shipments, by MVA top rated category and period

Quantity in MVA top rated; Shares in percent

Product type	Measure	2021	2022	2023
60-299 MVA top rated	Quantity: MVA top rating	***	***	***
300-499 MVA top rated	Quantity: MVA top rating	***	***	***
500-799 MVA top rated	Quantity: MVA top rating	***	***	***
800+ MVA top rated	Quantity: MVA top rating	***	***	***
All MVA top rated categories	Quantity: MVA top rating	***	***	***
60-299 MVA top rated	Share of quantity: MVA top rating	***	***	***
300-499 MVA top rated	Share of quantity: MVA top rating	***	***	***
500-799 MVA top rated	Share of quantity: MVA top rating	***	***	***
800+ MVA top rated	Share of quantity: MVA top rating	***	***	***
All MVA top rated categories	Share of quantity: MVA top rating	100.0	100.0	100.0

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“.

Table F-7

LPTs: U.S. producers' U.S. shipments and U.S. importers' U.S. shipments of 60 to 299 MVA top rated products, by source and period

Quantity in MVA top rated; Shares and ratios in percent

Source	Measure	2021	2022	2023
U.S. producers	Quantity	***	***	***
South Korea	Quantity	***	***	***
Nonsubject sources	Quantity	***	***	***
All import sources	Quantity	***	***	***
All sources	Quantity	***	***	***
U.S. producers	Share	***	***	***
South Korea	Share	***	***	***
Nonsubject sources	Share	***	***	***
All import sources	Share	***	***	***
All sources	Share	***	***	***
U.S. producers	Ratio	***	***	***
South Korea	Ratio	***	***	***
Nonsubject sources	Ratio	***	***	***
All import sources	Ratio	***	***	***
All sources	Ratio	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“. Ratios represent the ratio of shipments reported in this table to overall amount of LPT reported in apparent U.S. consumption as reported in Part I of this report.

Table F-8

LPTs: U.S. producers' U.S. shipments and U.S. importers' U.S. shipments of 300 to 499 MVA top rated products, by source and period

Quantity in MVA top rated; Shares and ratios in percent

Source	Measure	2021	2022	2023
U.S. producers	Quantity	***	***	***
South Korea	Quantity	***	***	***
Nonsubject sources	Quantity	***	***	***
All import sources	Quantity	***	***	***
All sources	Quantity	***	***	***
U.S. producers	Share	***	***	***
South Korea	Share	***	***	***
Nonsubject sources	Share	***	***	***
All import sources	Share	***	***	***
All sources	Share	100.0	100.0	100.0
U.S. producers	Ratio	***	***	***
South Korea	Ratio	***	***	***
Nonsubject sources	Ratio	***	***	***
All import sources	Ratio	***	***	***
All sources	Ratio	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“. Ratios represent the ratio of shipments reported in this table to overall amount of LPT reported in apparent U.S. consumption as reported in Part I of this report.

Table F-9

LPTs: U.S. producers' U.S. shipments and U.S. importers' U.S. shipments of 500 to 799 MVA top rated products, by source and period

Quantity in MVA top rated; Shares and ratios in percent

Source	Measure	2021	2022	2023
U.S. producers	Quantity	***	***	***
South Korea	Quantity	***	***	***
Nonsubject sources	Quantity	***	***	***
All import sources	Quantity	***	***	***
All sources	Quantity	***	***	***
U.S. producers	Share	***	***	***
South Korea	Share	***	***	***
Nonsubject sources	Share	***	***	***
All import sources	Share	***	***	***
All sources	Share	***	***	***
U.S. producers	Ratio	***	***	***
South Korea	Ratio	***	***	***
Nonsubject sources	Ratio	***	***	***
All import sources	Ratio	***	***	***
All sources	Ratio	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“. Ratios represent the ratio of shipments reported in this table to overall amount of LPT reported in apparent U.S. consumption as reported in Part I of this report.

Table F-10

LPTs: U.S. producers' U.S. shipments and U.S. importers' U.S. shipments of 800+ MVA top rated products, by source and period

Quantity in MVA top rated; Shares and ratios in percent

Source	Measure	2021	2022	2023
U.S. producers	Quantity	***	***	***
South Korea	Quantity	***	***	***
Nonsubject sources	Quantity	***	***	***
All import sources	Quantity	***	***	***
All sources	Quantity	***	***	***
U.S. producers	Share	***	***	***
South Korea	Share	***	***	***
Nonsubject sources	Share	***	***	***
All import sources	Share	***	***	***
All sources	Share	100.0	100.0	100.0
U.S. producers	Ratio	***	***	***
South Korea	Ratio	***	***	***
Nonsubject sources	Ratio	***	***	***
All import sources	Ratio	***	***	***
All sources	Ratio	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as “---“. Ratios represent the ratio of shipments reported in this table to overall amount of LPT reported in apparent U.S. consumption as reported in Part I of this report.

APPENDIX G

COMPANY-SPECIFIC FINANCIAL DATA

Table G-1
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

Net sales quantity

Quantity in MVA top rated

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

Table continued.

Table G-1 Continued
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

Net sales value

Value in 1,000 dollars

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

Table continued.

Table G-1 Continued
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

COGS

Value in 1,000 dollars

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

Table continued.

Table G-1 Continued
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

Gross profit or (loss)

Value in 1,000 dollars

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

Table continued.

Table G-1 Continued
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

SG&A expenses

Value in 1,000 dollars

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

Table continued.

Table G-1 Continued
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

Operating income or (loss)

Value in 1,000 dollars

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

Table continued.

Table G-1 Continued
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

Net income or (loss)

Value in 1,000 dollars

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

Table continued.

Table G-1 Continued
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

COGS to net sales ratio

Ratio in percent

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

Table continued.

Table G-1 Continued
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

Gross profit or (loss) to net sales ratio

Ratio in percent

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

Table continued.

Table G-1 Continued
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

SG&A expenses to net sales ratio

Ratio in percent

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

Table continued.

Table G-1 Continued
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

Operating income or (loss) to net sales ratio

Ratio in percent

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

Table continued.

Table G-1 Continued
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

Net income or (loss) to net sales ratio

Ratio in percent

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

Table continued.

Table G-1 Continued
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

Unit net sales value

Unit value in dollars per MVA top rated

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

Table continued.

Table G-1 Continued
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

Unit total raw materials cost

Unit value in dollars per MVA top rated

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

Table continued.

Table G-1 Continued
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

Unit direct labor cost

Unit value in dollars per MVA top rated

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

Table continued.

Table G-1 Continued
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

Unit other factory costs

Unit value in dollars per MVA top rated

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

Table continued.

Table G-1 Continued
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

Unit COGS

Unit value in dollars per MVA top rated

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

Table continued.

Table G-1 Continued
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

Unit gross profit or (loss)

Unit value in dollars per MVA top rated

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

Table continued.

Table G-1 Continued
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

Unit SG&A expenses

Unit value in dollars per MVA top rated

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

Table continued.

Table G-1 Continued
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

Unit operating income or (loss)

Unit value in dollars per MVA top rated

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

Table continued.

Table G-1 Continued
LPTs: U.S. producers' sales, costs/expenses, and profitability, by firm and period

Unit net income or (loss)

Unit value in dollars per MVA top rated

Firm	2021	2022	2023
Delta Star	***	***	***
HD HPT USA	***	***	***
Hitachi Energy USA	***	***	***
Hyosung HICO	***	***	***
PA Transformer	***	***	***
Prolec-GE Waukesha	***	***	***
Virginia Transformer	***	***	***
WEG Transformers	***	***	***
All firms	***	***	***

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

Note: Shares and ratios shown as "0.0" represent values greater than zero, but less than "0.05" percent. Zeroes, null values, and undefined calculations are suppressed and shown as "---".

APPENDIX H

PURCHASER'S POSTHEARING BID DATA

Table H-1
LPTs: U.S. purchaser *'s bid event 1 requirements**

Bid data; Event 1	Bid requirements
Bid end date	***
Base MVA	***
Top MVA	***
Load loss evaluation--dollars per kW	***
Number of units	***
High line kV	***
No load loss evaluation--dollars per kW	***
Winding BIL	***

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

Note: Zeroes, null values, and undefined calculations are suppressed and shown as "---".

Table H-2
LPTs: U.S. purchaser *'s bid event 1 received offers**

Value and cost in 1,000 dollars

Bid offer	Firm name	Country	Base value	Limited to LPTs	Evaluated cost	Winning bid	Explanation
Bid 1	***	***	***	***	***	***	***
Bid 2	***	***	***	***	***	***	***
Bid 3	***	***	***	***	***	***	***

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

Note: Zeroes, null values, and undefined calculations are suppressed and shown as "---".