Crystalline Silicon Photovoltaic Cells

Inv. No. TA-201-75 (Final)

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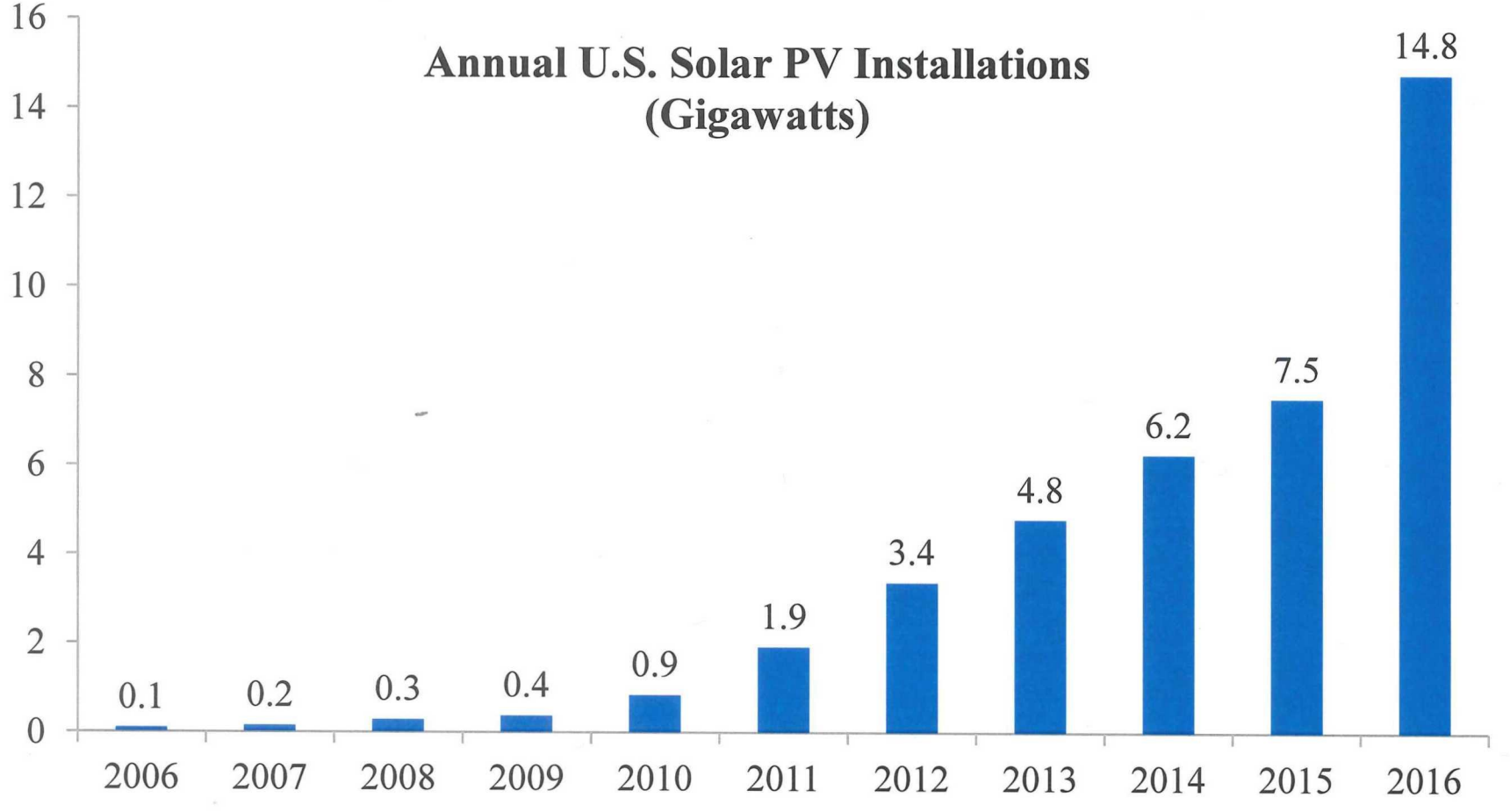
Themes

- The domestic CSPV industry is seriously injured.
- The domestic CSPV industry is threatened with serious injury.
- Imports are a substantial cause of serious injury.

Context

CSPV Demand Increased More than Threefold over POI and Nearly Doubled in 2016



Source: GTM Research, SEIA. U.S. Solar Market Insight, 2016 Year in Review, Executive Summary at 6.

Injury

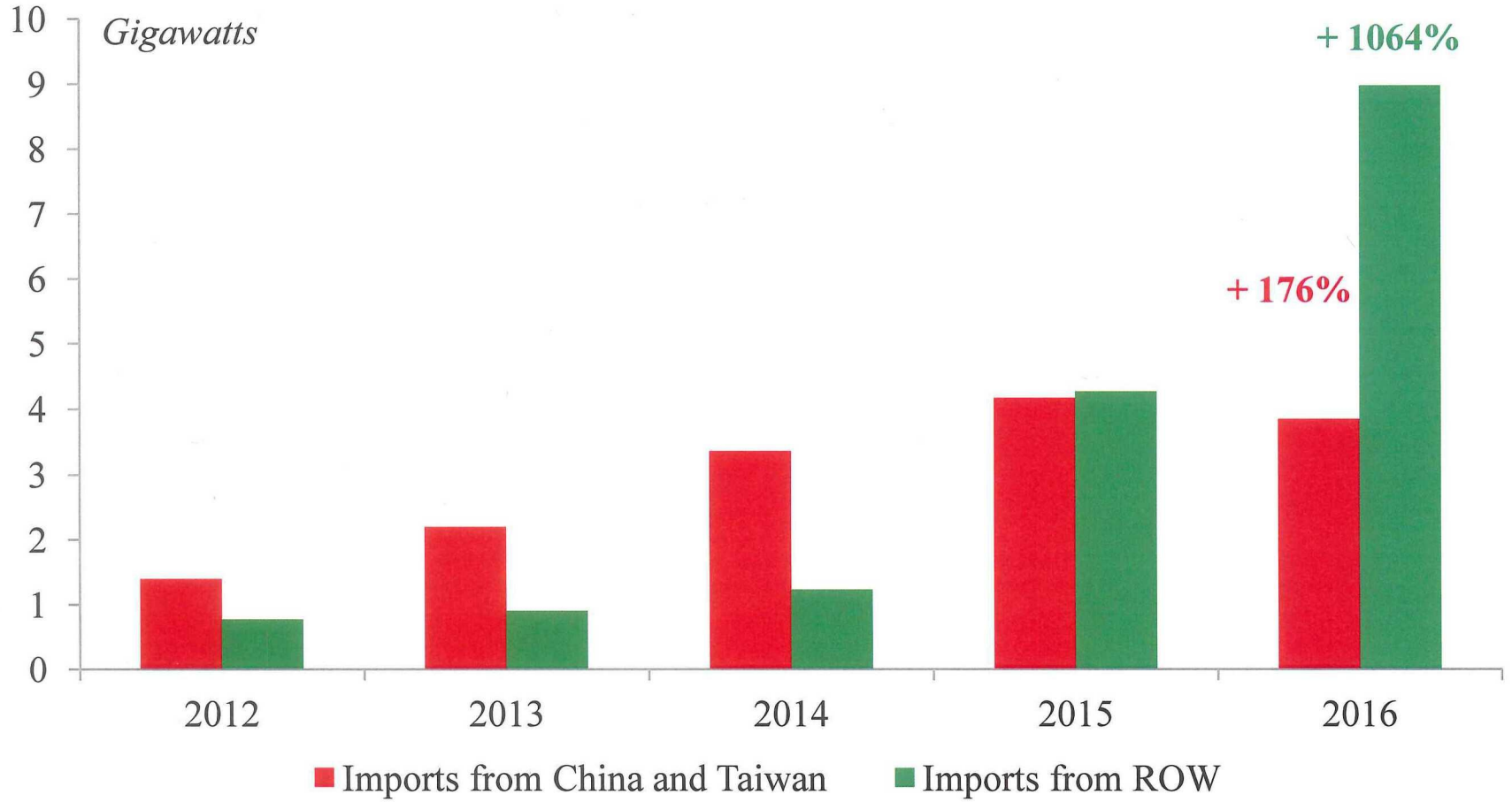
Statutory Factors

- Imports in increased quantities (actual or relative to production)
- Domestic industry is seriously injured or threatened with serious injury
- Imports are a substantial cause of serious injury (or threat)

Source: USITC Publication 3479. Inv. No. TA-201-73 (Steel 201). December, 2001. Commission Opinion at 27.

Injury

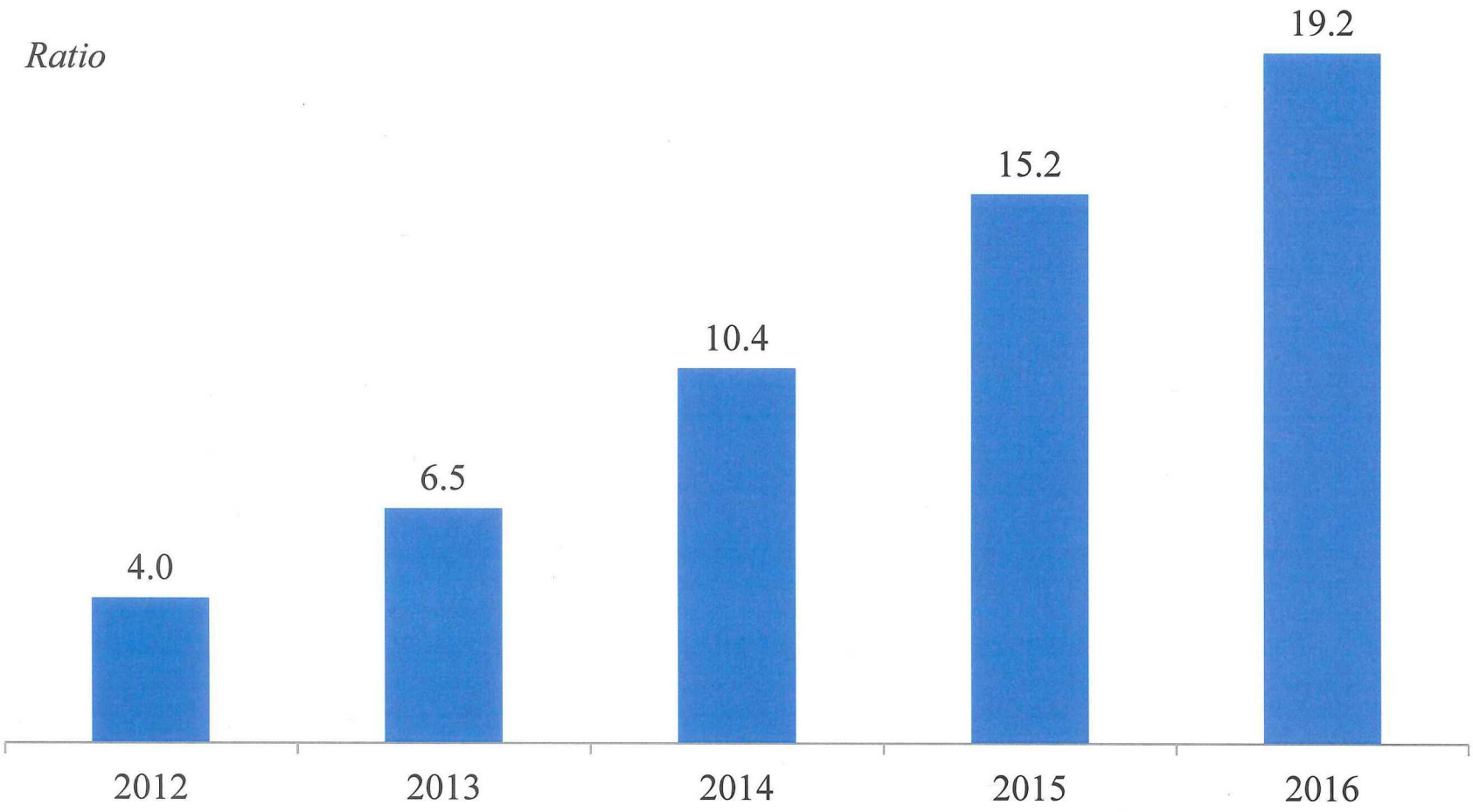
U.S. Imports Increased by 492% over the POI



Source: Prehearing Report Table C-1.

Injury

U.S. Imports Increased Relative to Production



Source: Prehearing Report Table C-3 (module production); and Table C-1 (CSPV product imports).

Injury

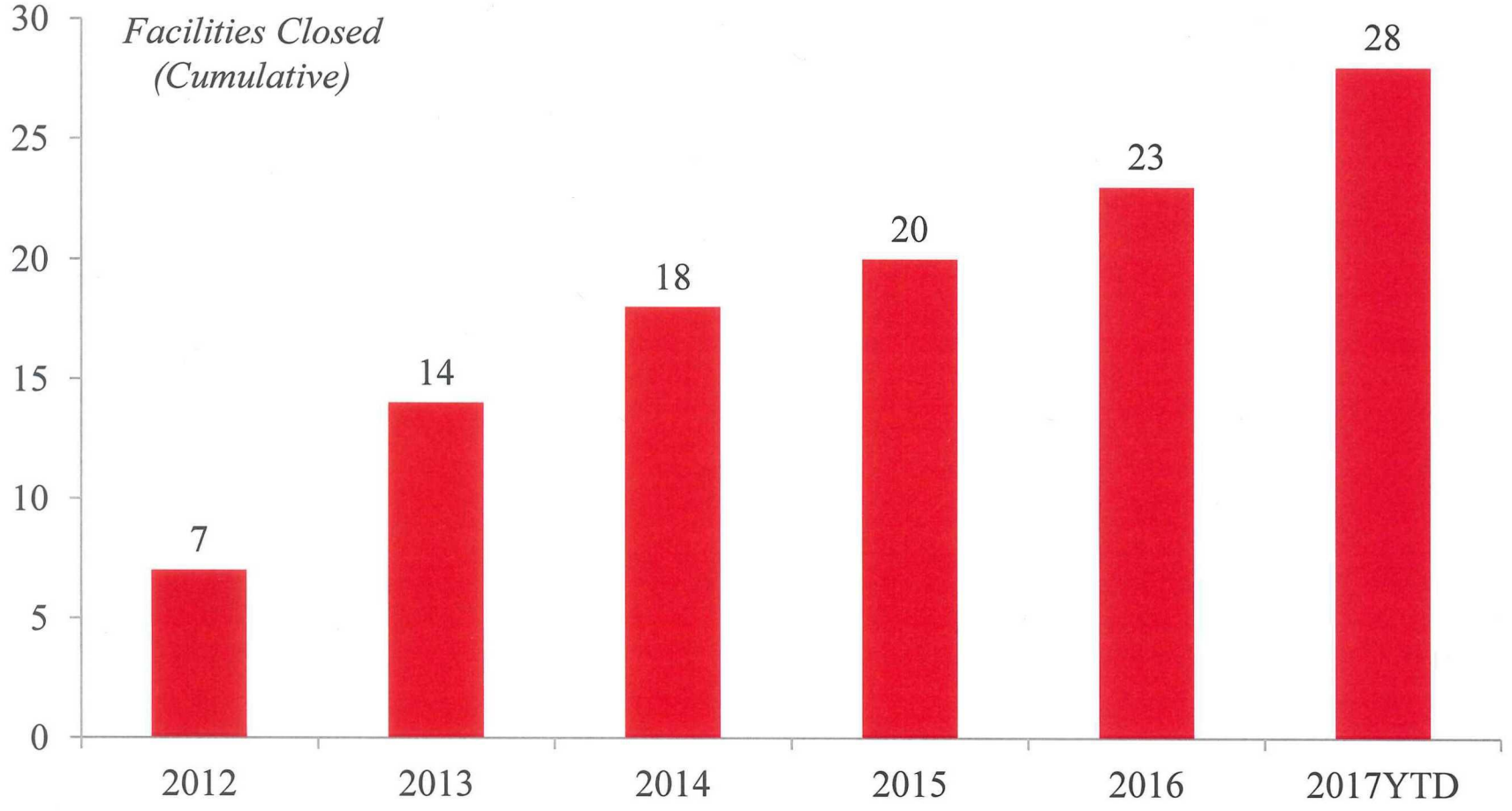
Serious Injury

- Significant idling of productive facilities
- Inability of a significant number of firms to carry out domestic production operations at a reasonable level of profit, and
- Significant unemployment or underemployment within the domestic industry

Source: USITC Publication 3479. Inv. No. TA-201-73 (Steel 201). December, 2001. Commission Opinion at 33.

Injury

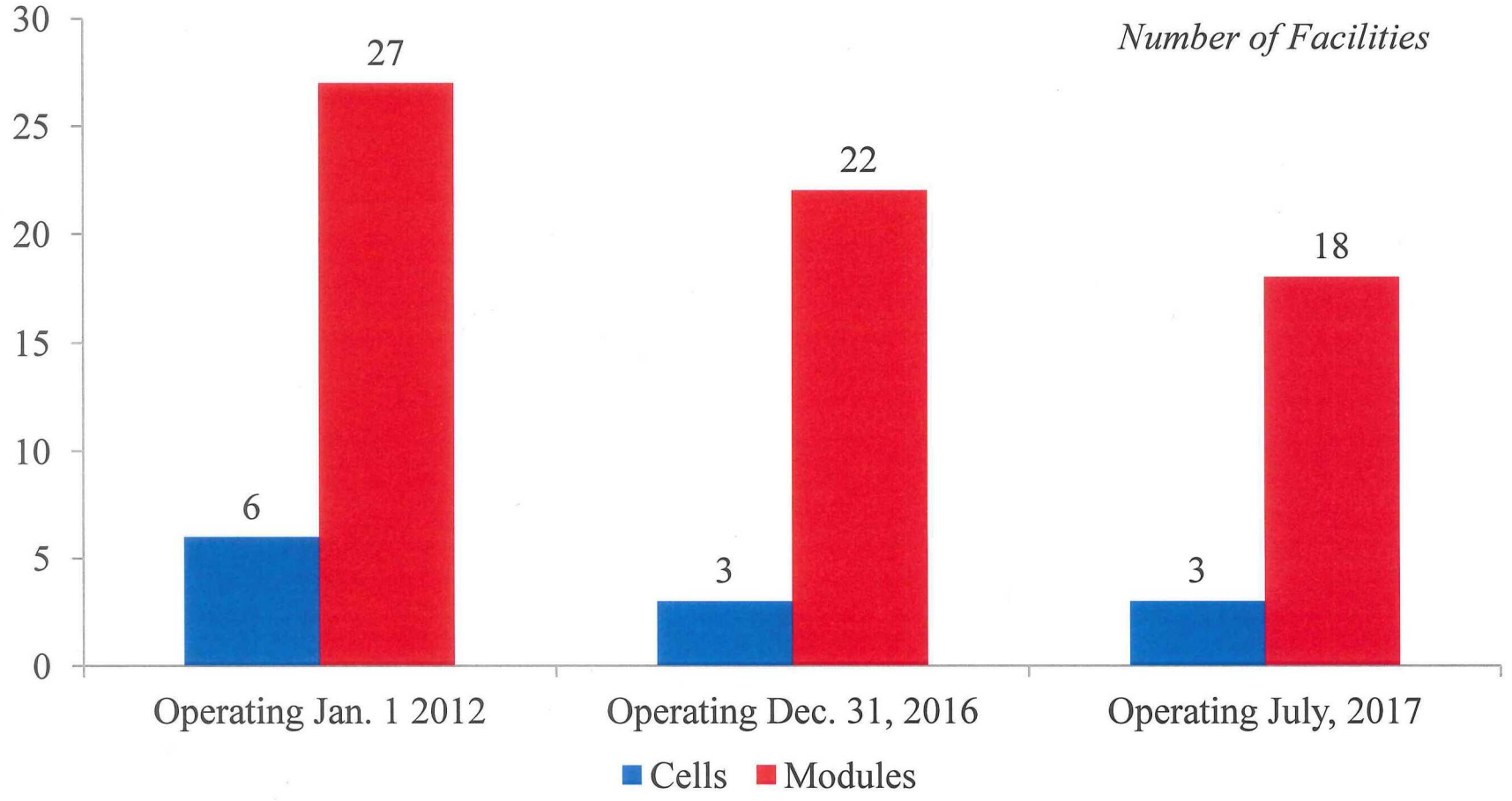
28 Domestic Facilities Closed over the POI



Source: Prehearing Report Table III-3, at III-7.

Injury

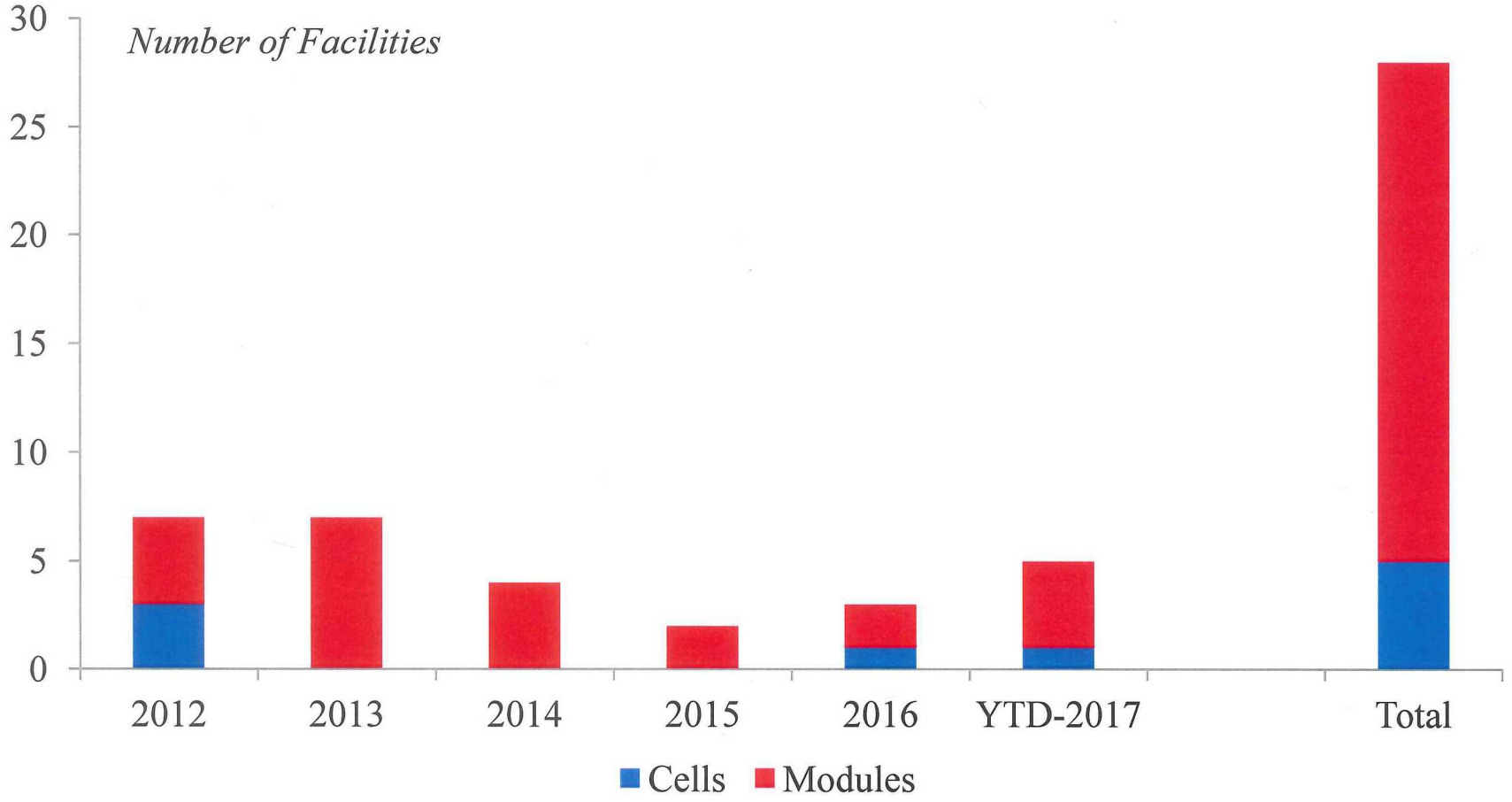
The Number of Domestic Production Facilities Decreased over the POI



Source: Prehearing Report Table III-3, at III-7.

Injury

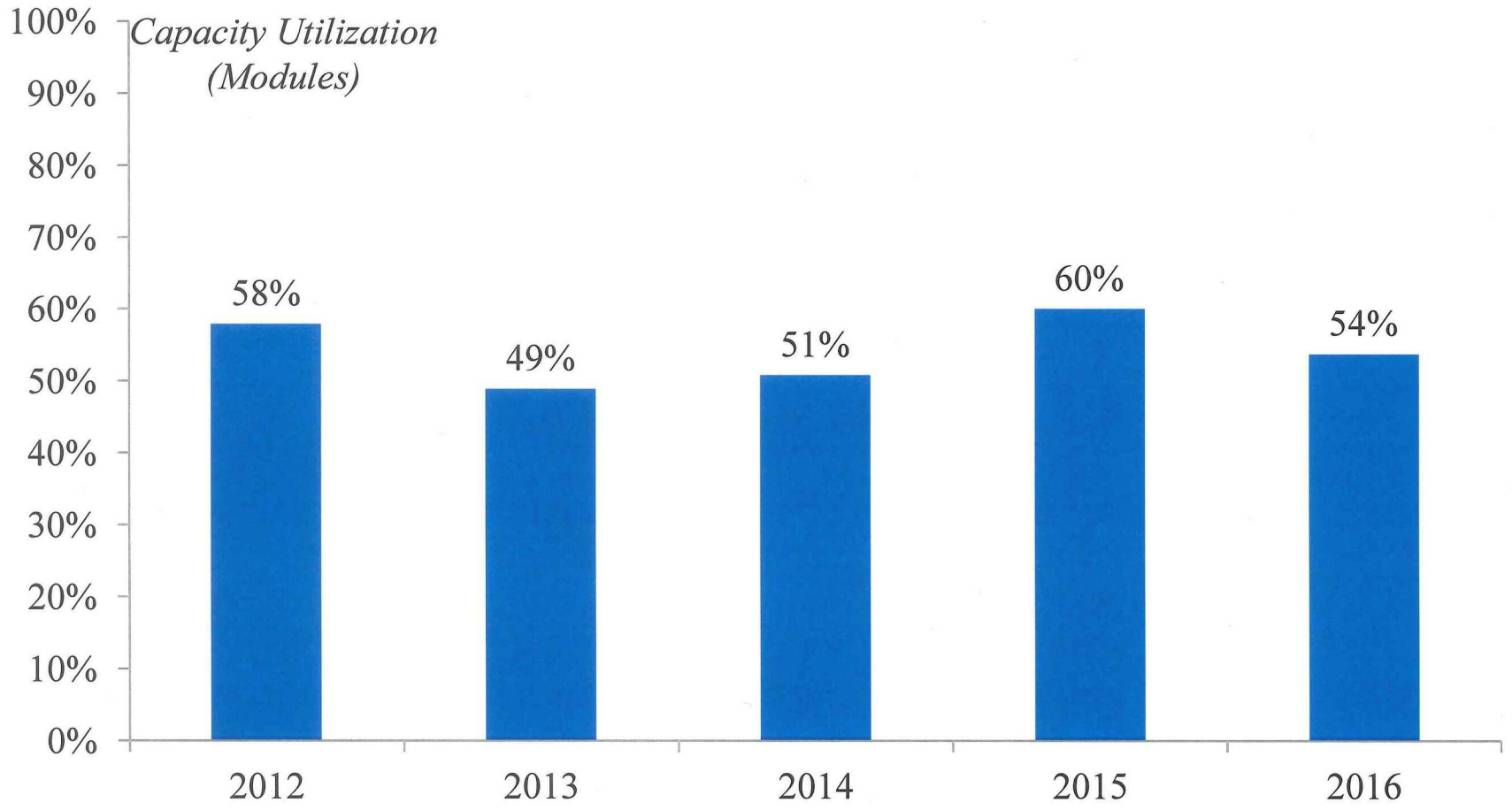
28 Domestic Facilities Have Closed or Are Currently in Bankruptcy



Source: Prehearing Report Table III-3, at III-7.

Injury

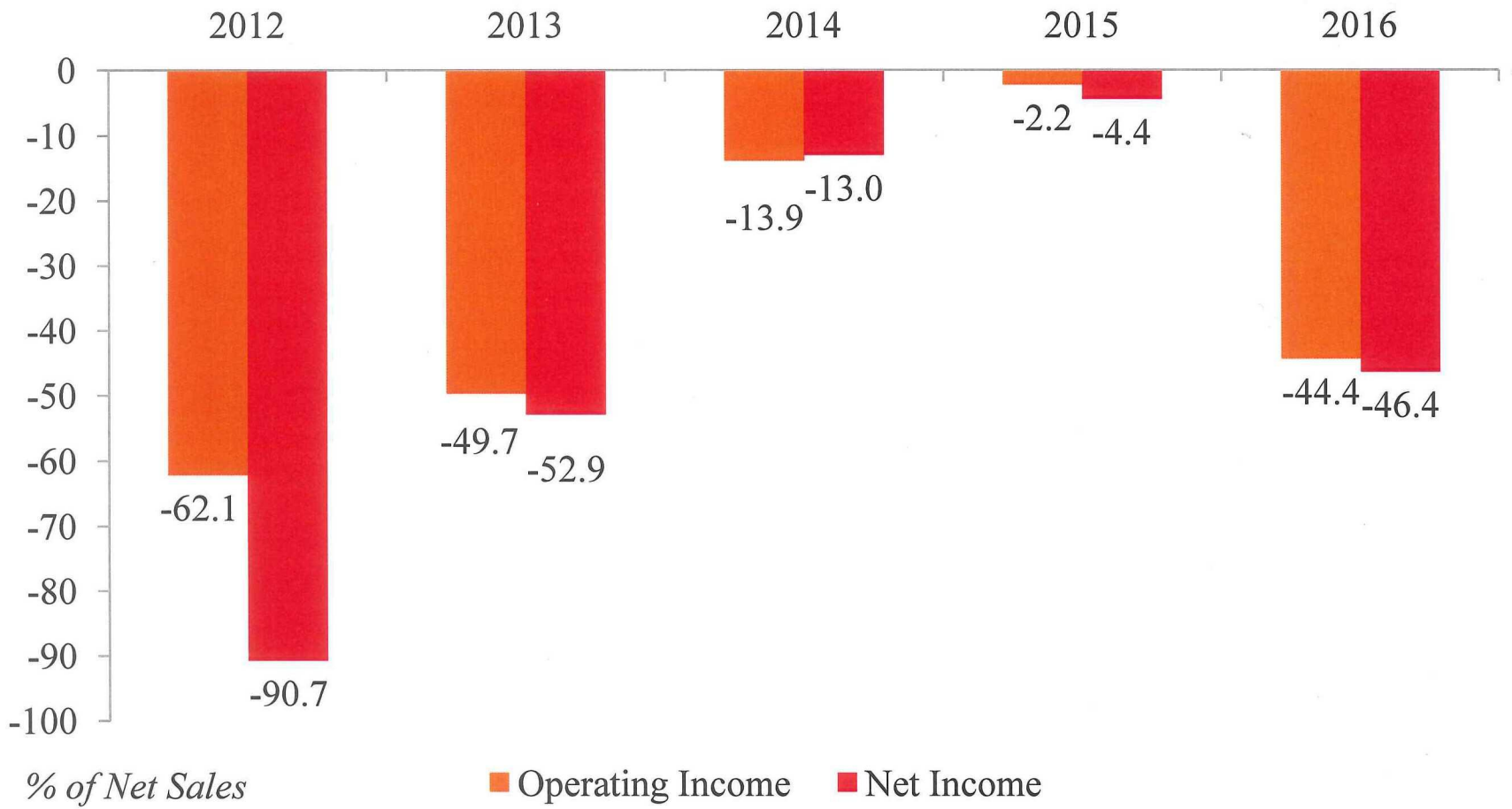
Capacity Utilization Was Chronically Weak Despite a Threefold Increase in Demand



Source: Prehearing Report Table C-3 (modules).

Injury

Domestic Industry Was Highly Unprofitable



Source: Prehearing Report Table C-3 (Modules).

Injury

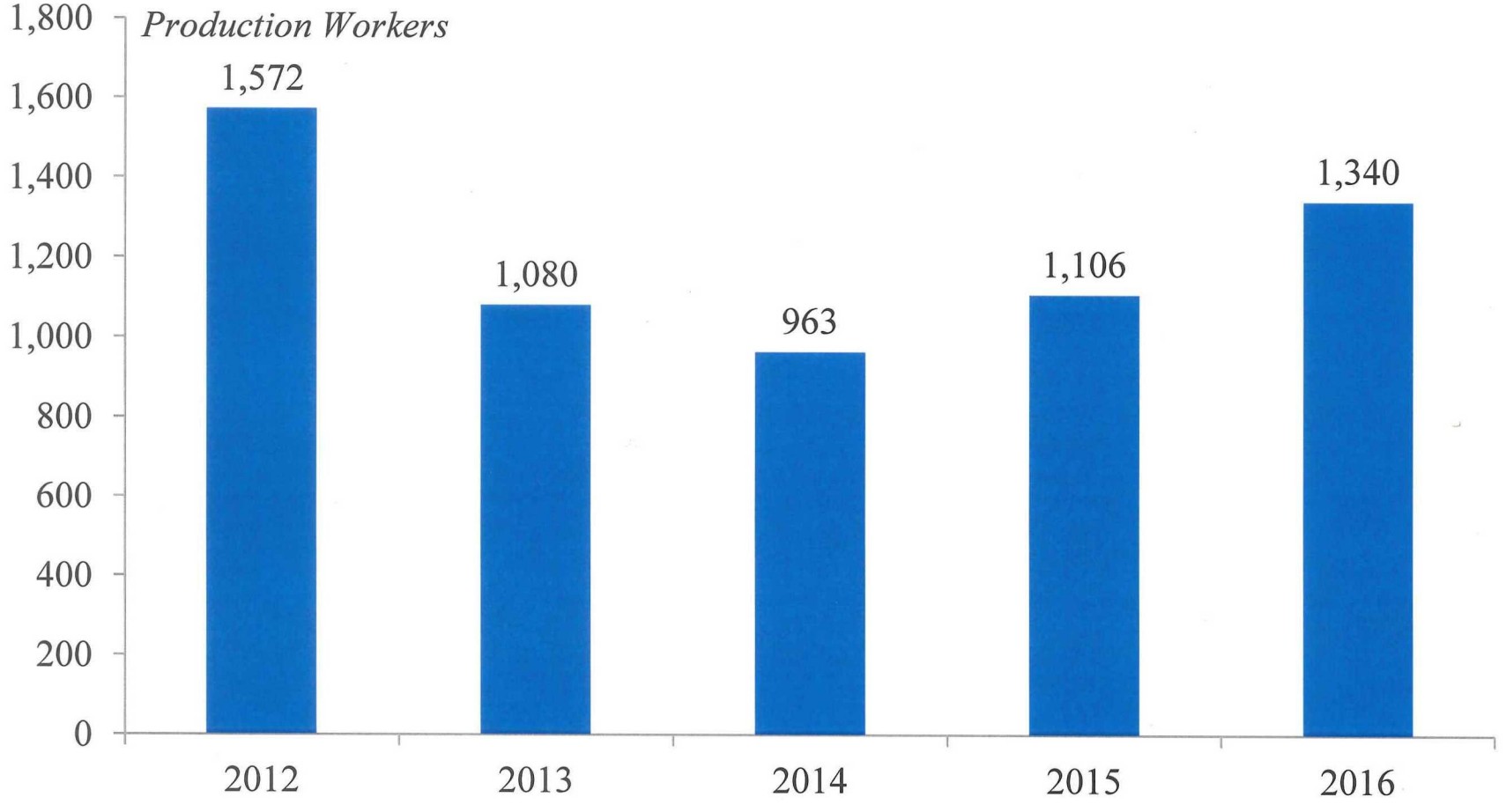
Domestic Producers were Unprofitable

- Operating losses were widespread among firms in the industry.
- Over the POI there were 49 firm-specific annual observations.
  - Operating income was negative in 38 observations.
  - 4 different firms with lowest annual operating income.
- Median operating ratio for domestic module producers
  - Negative all five years
  - Worse than negative 40 percent in four years.

Source: Prehearing Report Table E-3.

Injury

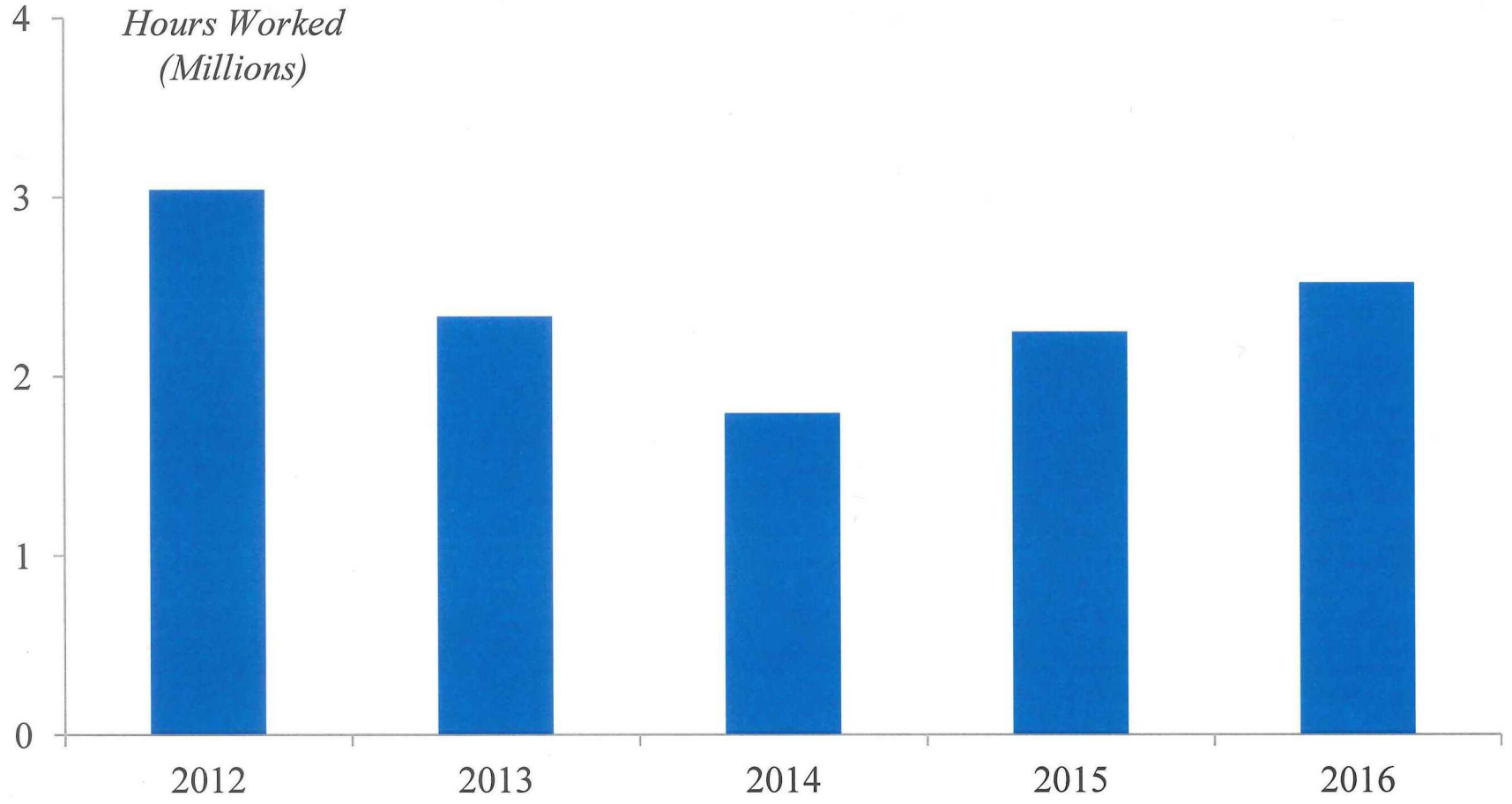
Employment Declined Despite the Large Increase in Demand



Source: Table C-3 (Modules); Solar II, Table C-2.

Injury

Hours Worked Declined Despite the Large Increase in Demand



Source: Table C-3 (Modules).

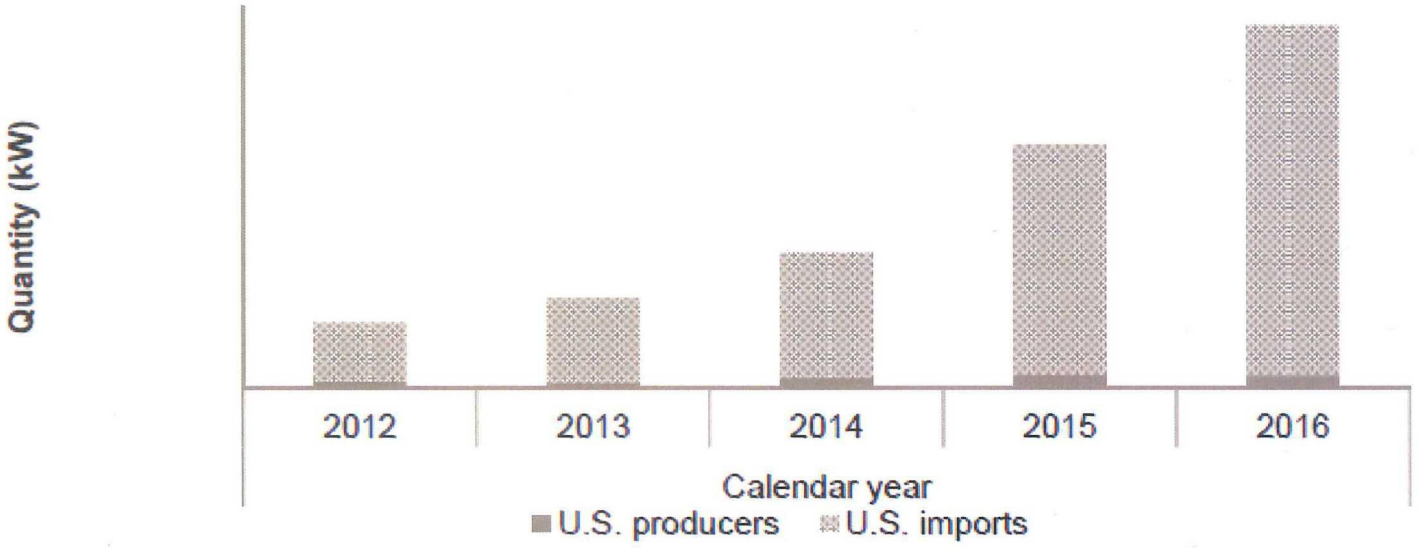
Threat

Factors Demonstrating a Threat of Serious Injury

- Persistent decline in market share.
- Growing domestic and imported inventories.
- Downward trends in profitability.
- Increasing underemployment in the domestic industry.
- Inability to maintain existing levels of capital expenditures and R&D.
- Continued attractiveness of the U.S. market as a focal point for the diversion of trade into other markets.

Threat

U.S. Producers' Market Share Declined throughout the POI

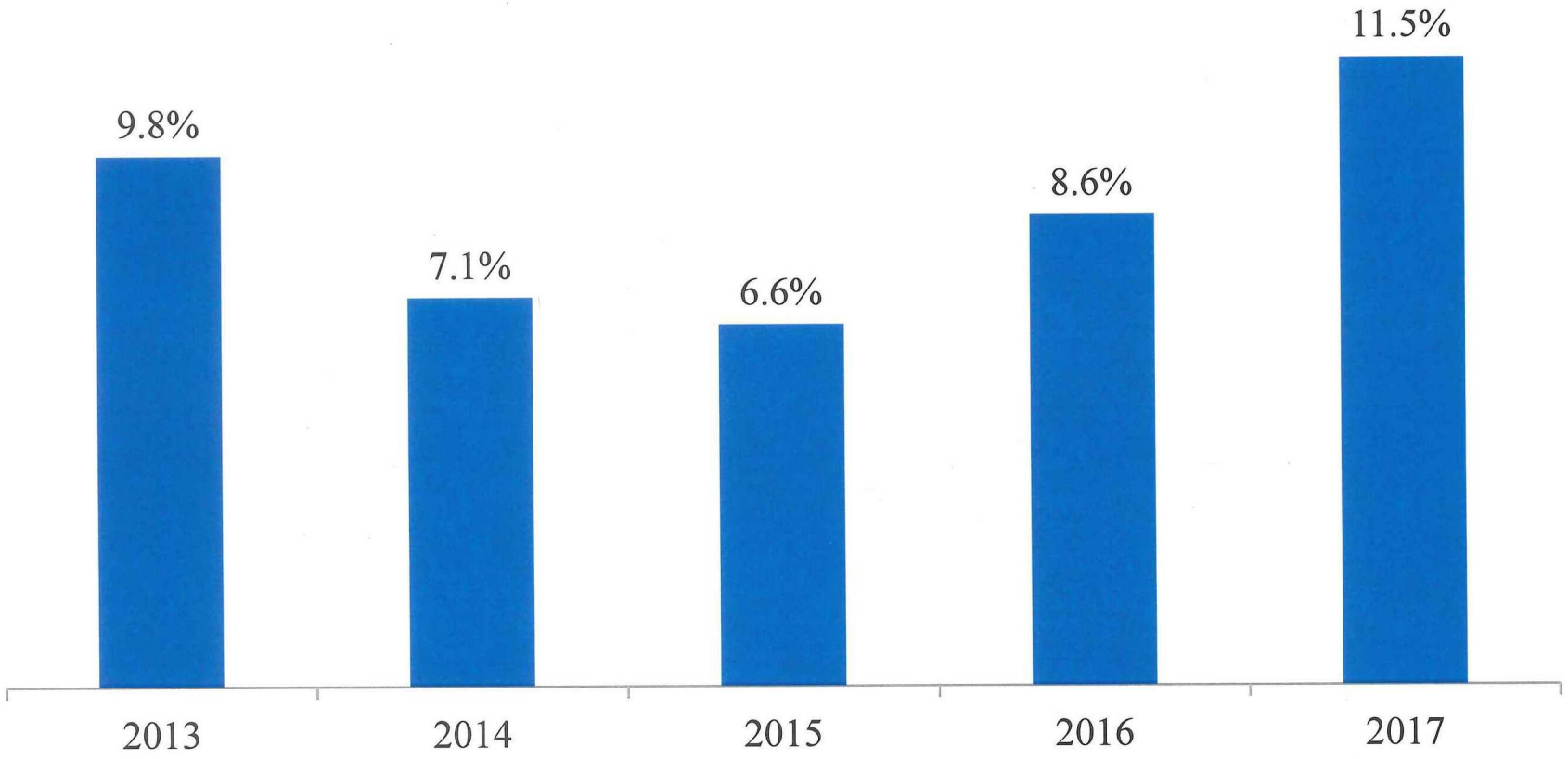


Source: Prehearing Report (Public) Figure IV-1, at IV-5.

Threat

Beginning Inventories of Imports Have Been Rising

Inventory-to-shipments



Source: Table C-3 (Modules).

Threat

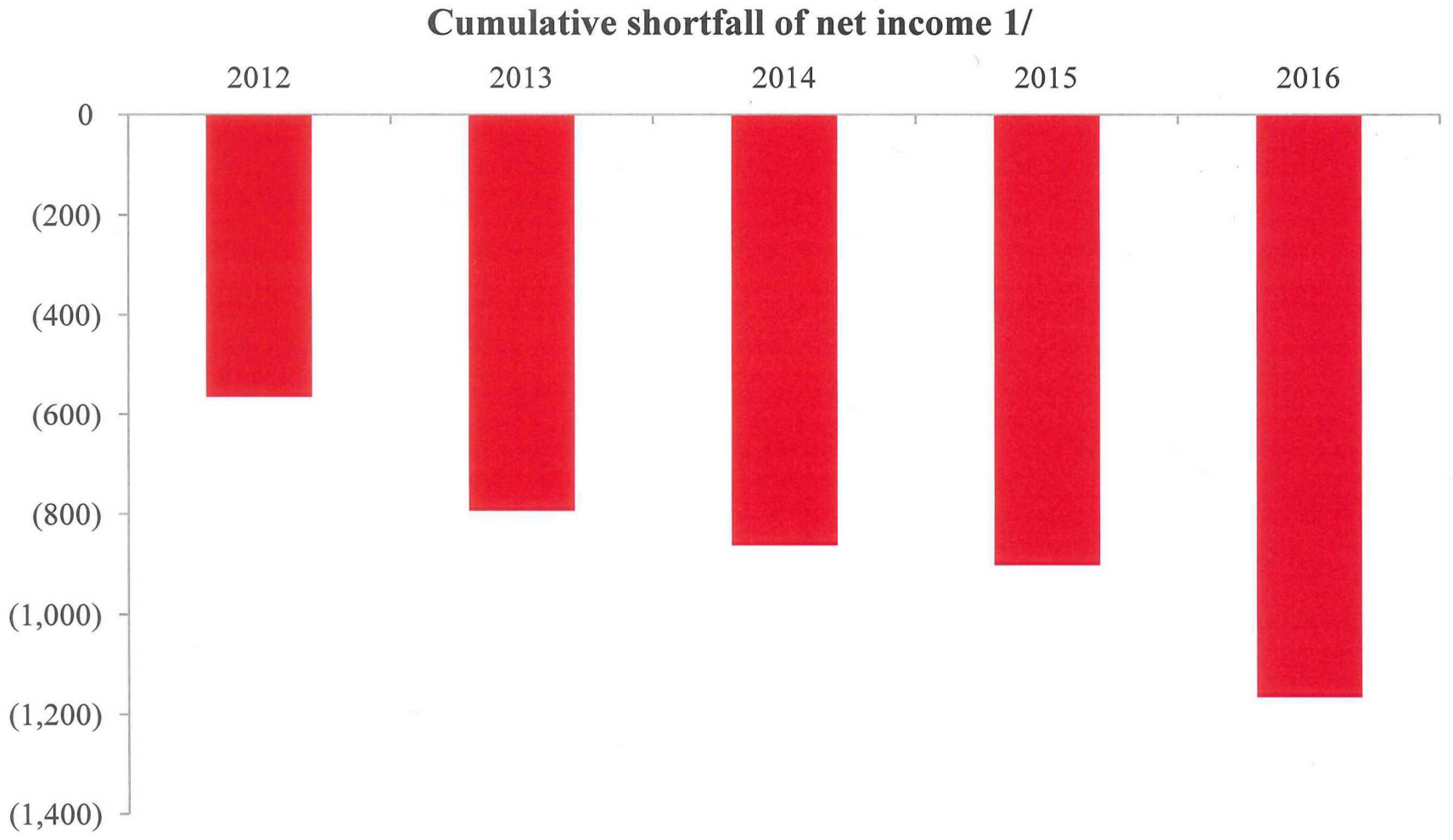
Inability to Finance Capital Expenditures and R&D

- Company asset values are trending down despite the large increase in demand.
- Trend analysis of individual firms—2016 assets relative to peak year.
  - 12 firms' asset values were below peak and six were at peak in 2016.
  - Assets increased by $101 million at "above peak" firms.
  - Assets declined by $493 million at "below peak" firms.
- These trends are indicative of an inability to finance capital expenditures.

Source: Prehearing Report Table E-4.

Threat

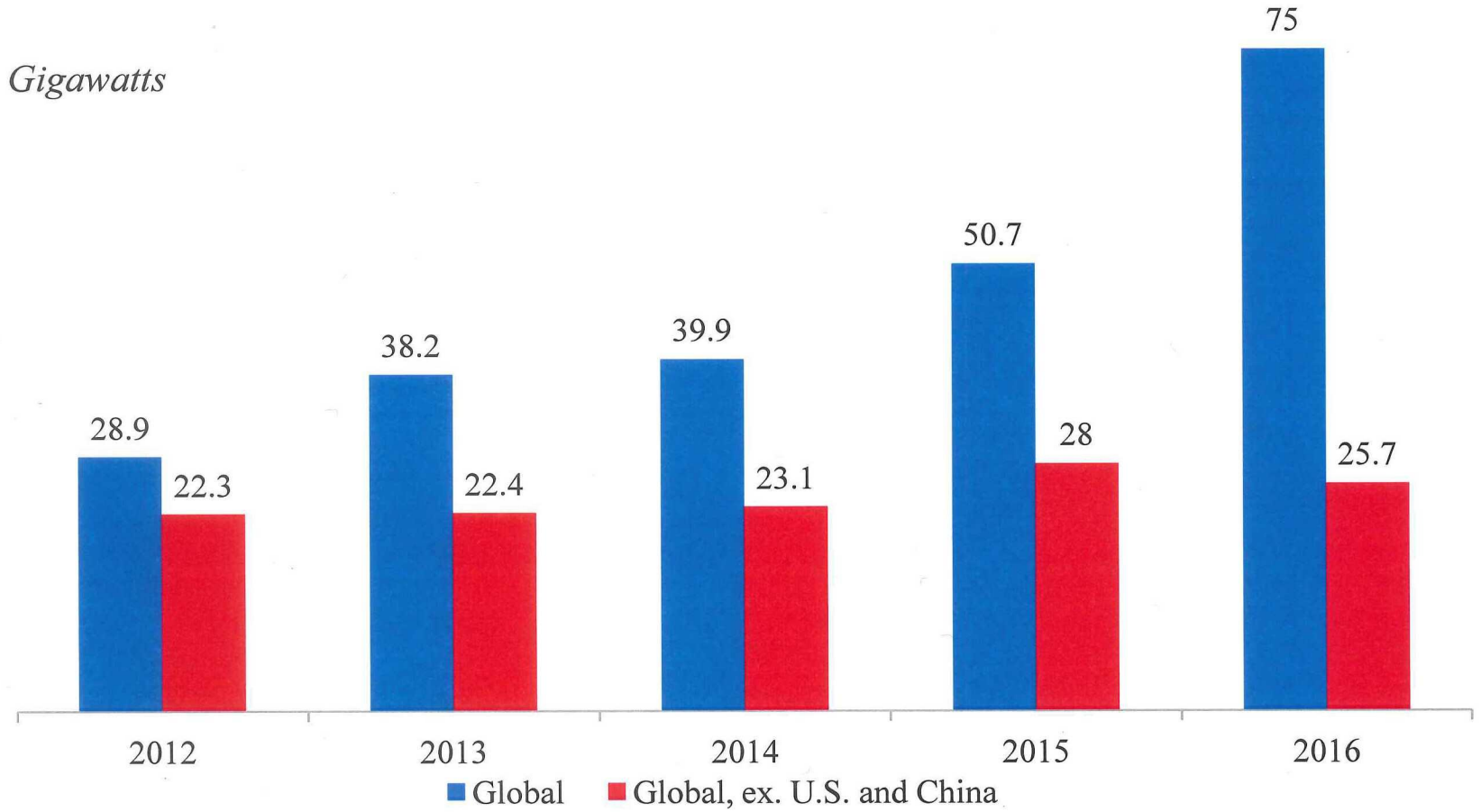
Shortfall of Net Income Hampers Capital Expenditures and R&D



Source: Prehearing Report Tables E-4 and C-3. 1/ Based on a reasonable return on assets.

Threat

Outside of China and United States, Installations Have Been Flat



Source: Prehearing Report at IV-7, Figure IV-2; International Energy Agency, Trends 2016 at Annex 2; and GTM, Solar market Insight Report 2016 Year in Review at 2.

Threat

Recent Additions Demonstrate Speed at Which Capacity Can Be Added

- March 2016 – Trina opened a 500 MW factory in Thailand, and then increased production capacity by 7.1 percent late last year.
- October 2016 – JA Solar announced plans to increase its capacity in Malaysia from 400 MW to 1 GW. The facility first opened in late 2015.
- February 2017 – SunPower announced an expansion of its capacity in China from 1.1 GW to 5 GW.
- February 2017 – Jinko Solar announced an expansion of cell production of 500 MW and module production by 1.5 GW.

2017 Trends

- Q1 2017 was the third highest quarter for global capacity expansions since 2014, with major expansions announced in China, Korea, the Philippines, India, Malaysia, Taiwan, Germany, and Italy.

Source: Prehearing Brief of Suniva,Inc. at 33. Mark Osborne, "Global solar PV manufacturing capacity expansion plans rebound in Q1," *PV Tech*, Apr 12, 2017.

Causation

- The injury suffered by U.S. producers was caused by low-priced imports.
- Significant global over-capacity depressed prices which were transmitted to the U.S. market through imports.
- Over-capacity stems primarily from massive expansions in China and by Chinese-owned or related companies in Malaysia, Thailand, and Vietnam.
- The new capacity is focused on exports to the U.S. market.

Causation

Theoretical Explanation

Global Over-Capacity

↓

Global Price Declines

↓

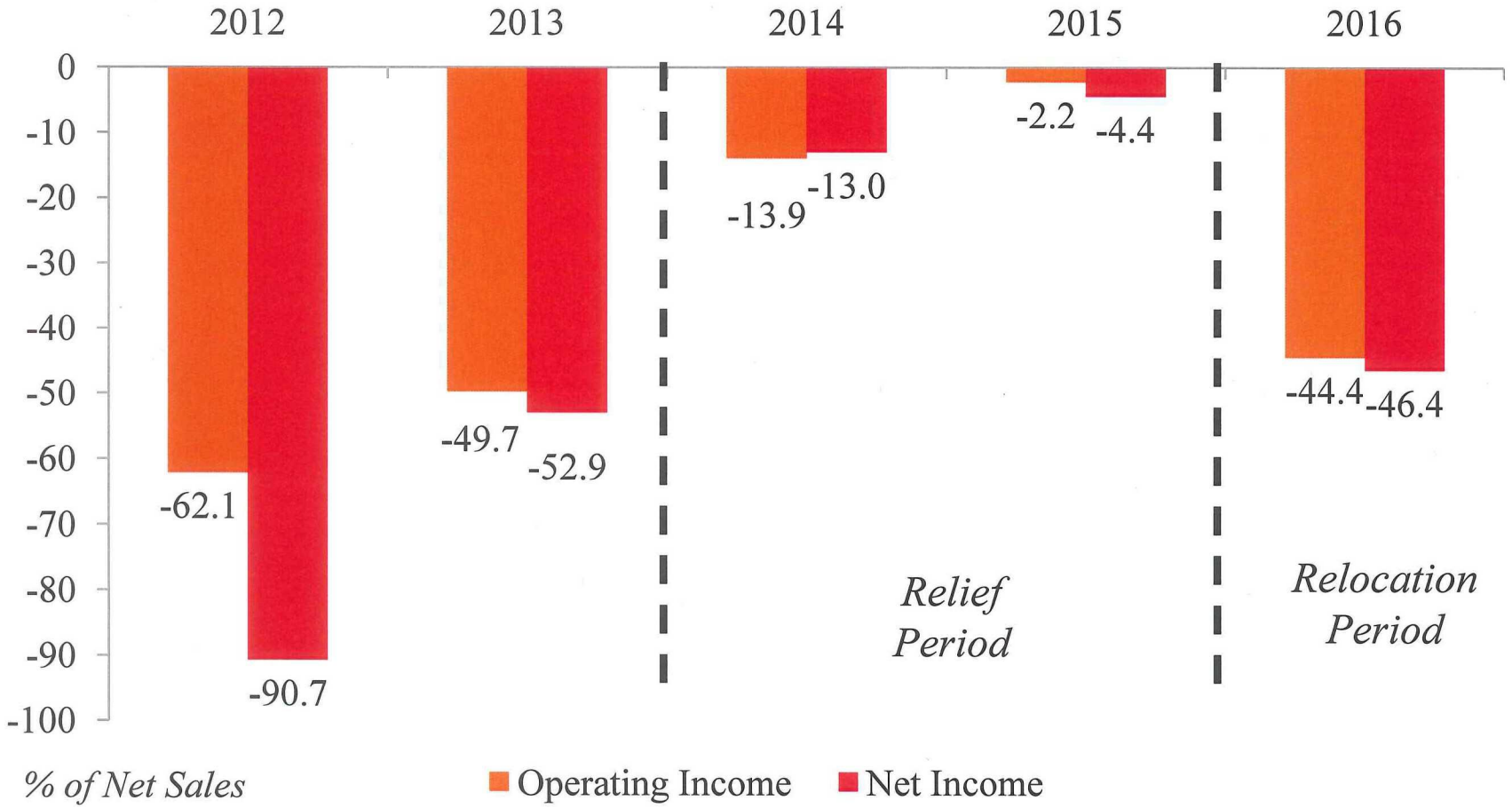
Transmitted through Increased Imports

↓

U.S. Price Declines

Causation

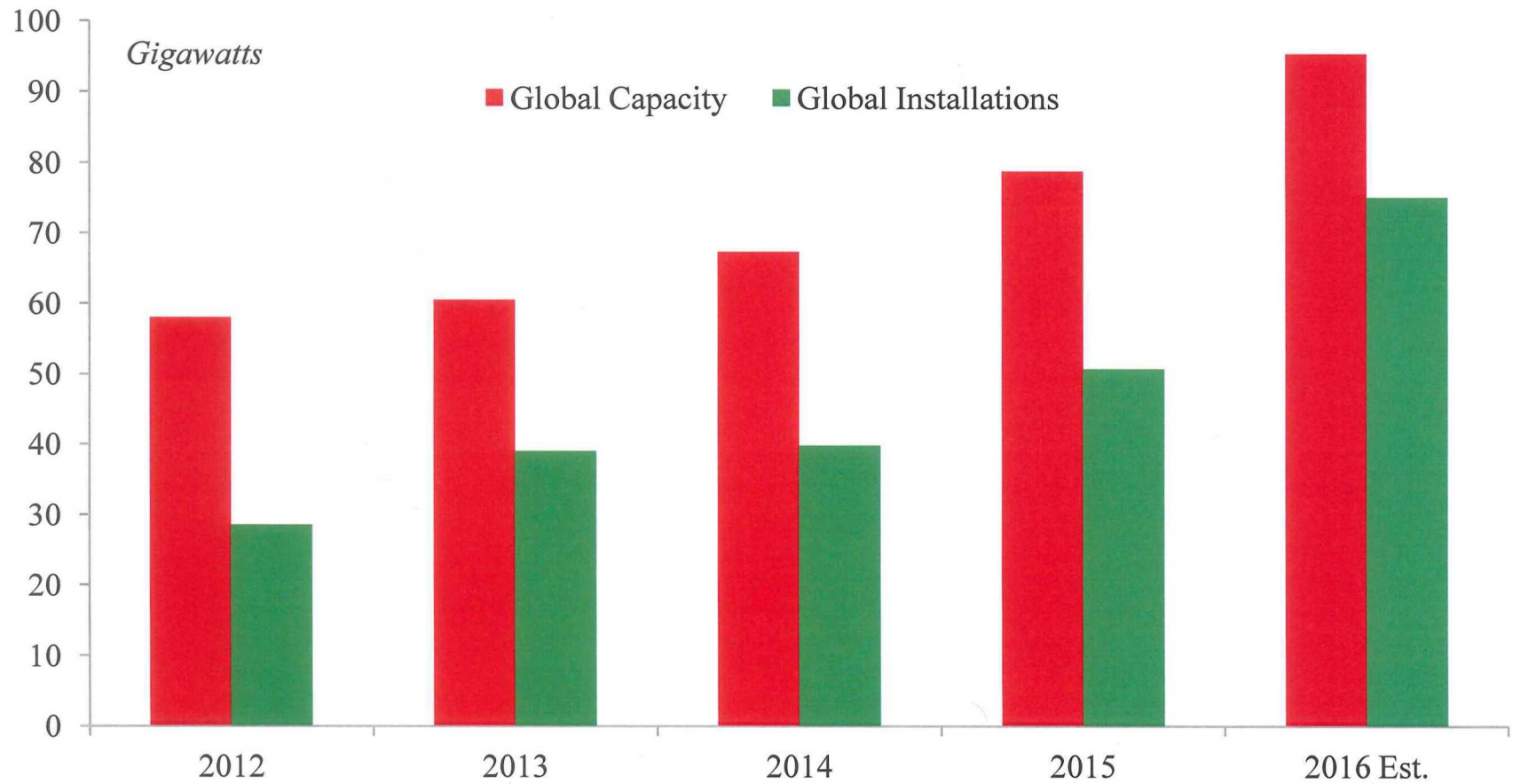
The Effects of the Orders Demonstrate That Imports Were the Most Important Cause of Injury



Source: Prehearing Report Table C-3 (Modules).

Causation

Chronic Global Over-Capacity

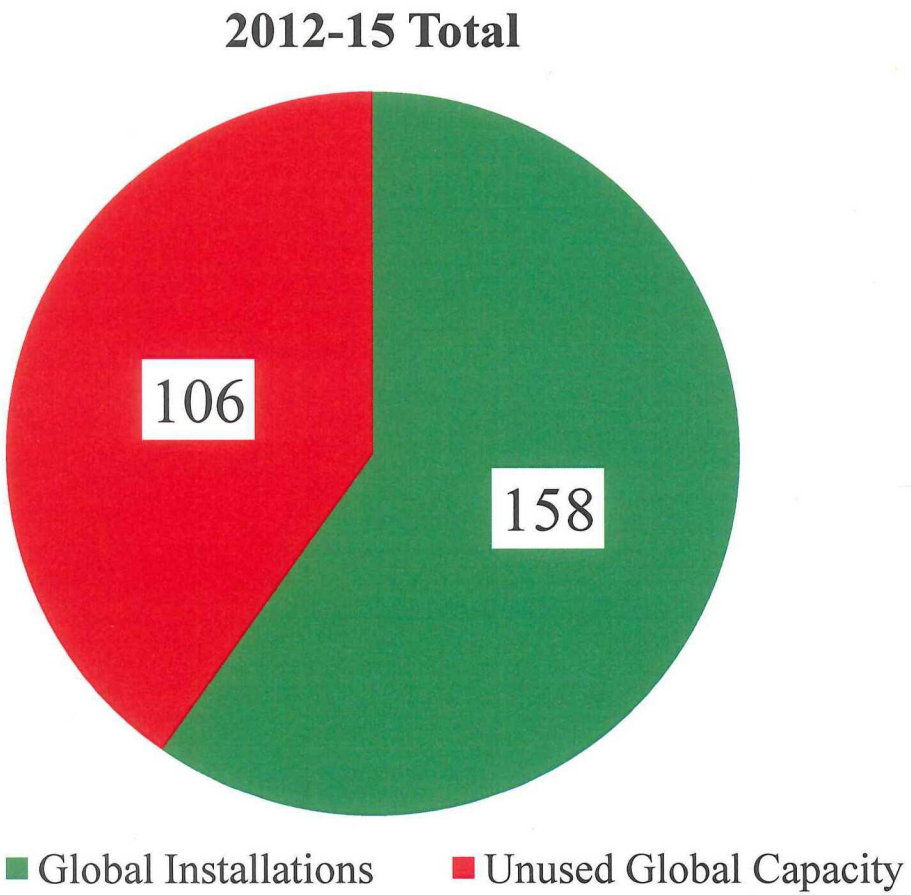


Source: IEA PVPS reports. Installations from Snapshot 2016 at 4; Trends 2016 at 8; Trends 2015 at 8; Trends 2014 at 9; Trends 2013 at 11. 2012-2015 Capacity from IEA Trends 2016, at 51, Table 6. 2016 Capacity estimated from 2015 IEA data and 2015-16 percentage changes from a proprietary report.

Causation

Chronic Global Over-Capacity

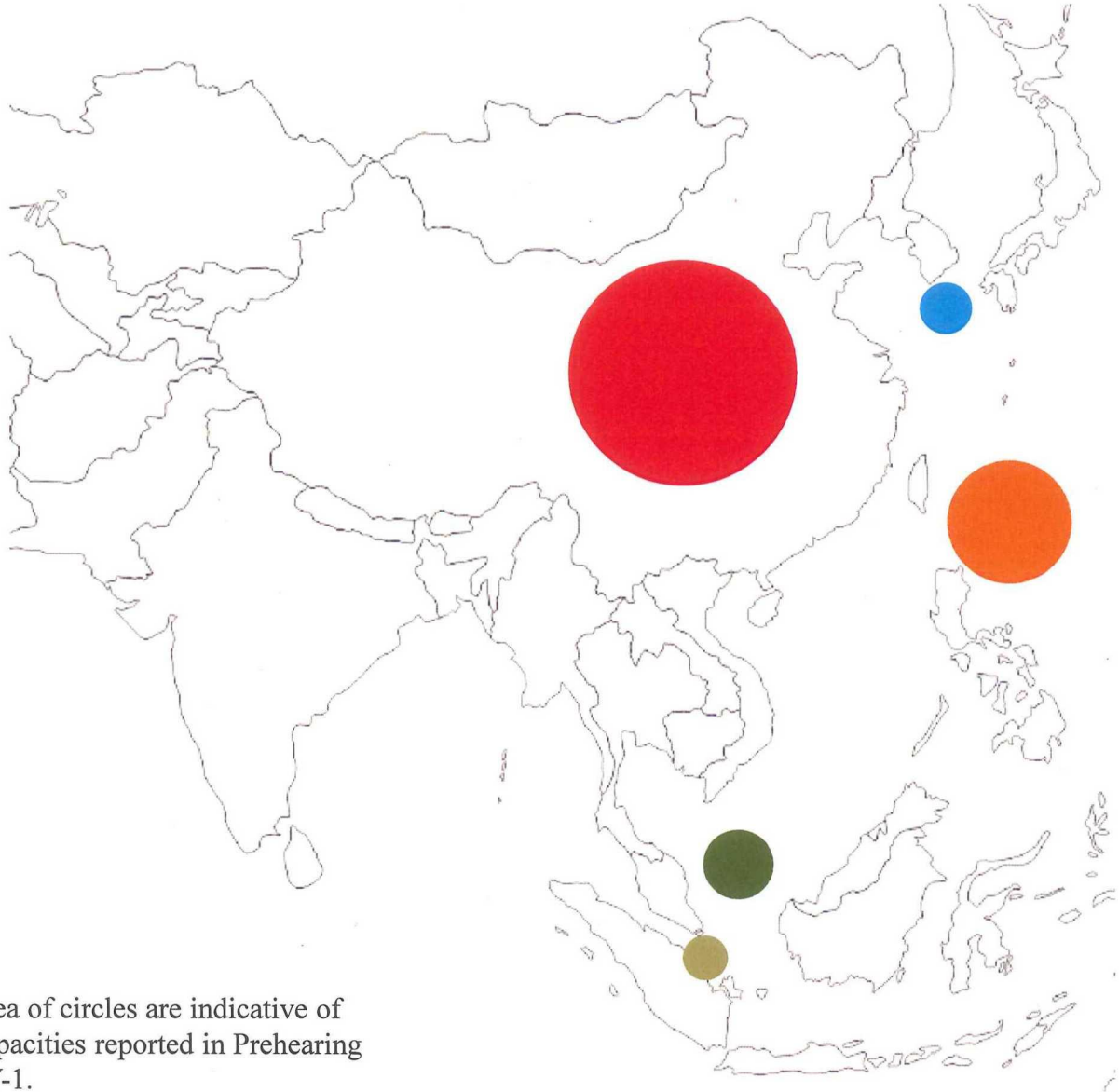
Gigawatts



Source: IEA PVPS reports. Trends 2016 at 8; Trends 2015 at 8; Trends 2014 at 9; Trends 2013 at 11. Capacity from IEA Trends 2016, at 51, Table 6. 2016 capacity data not yet available.

Causation

Production Capacity in East Asia- 2012



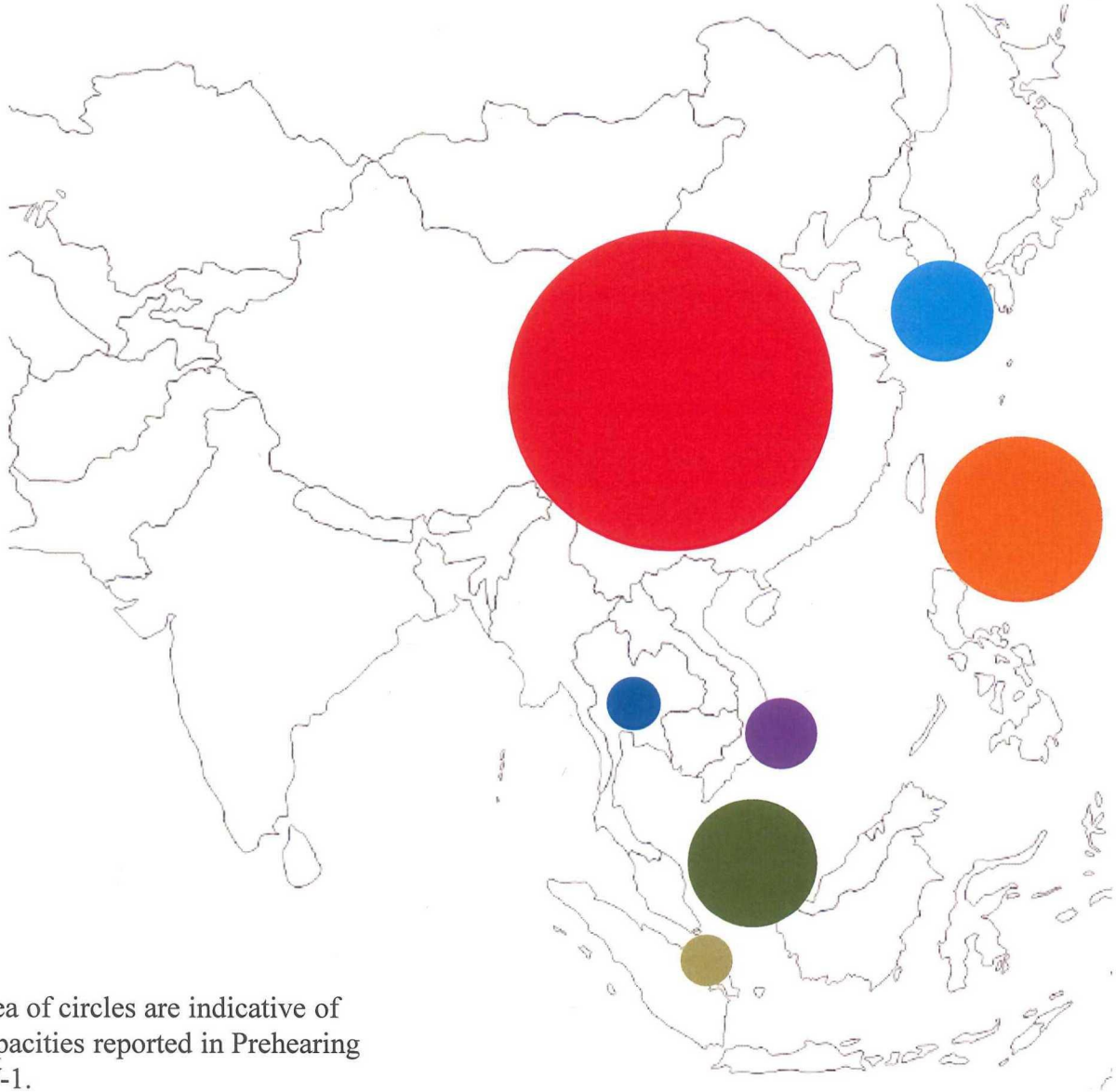
China
Taiwan
Malaysia
Korea
Singapore
Vietnam
Thailand

U.S. Capacity

Source: Area of circles are indicative of national capacities reported in Prehearing Report at V-1.

Causation

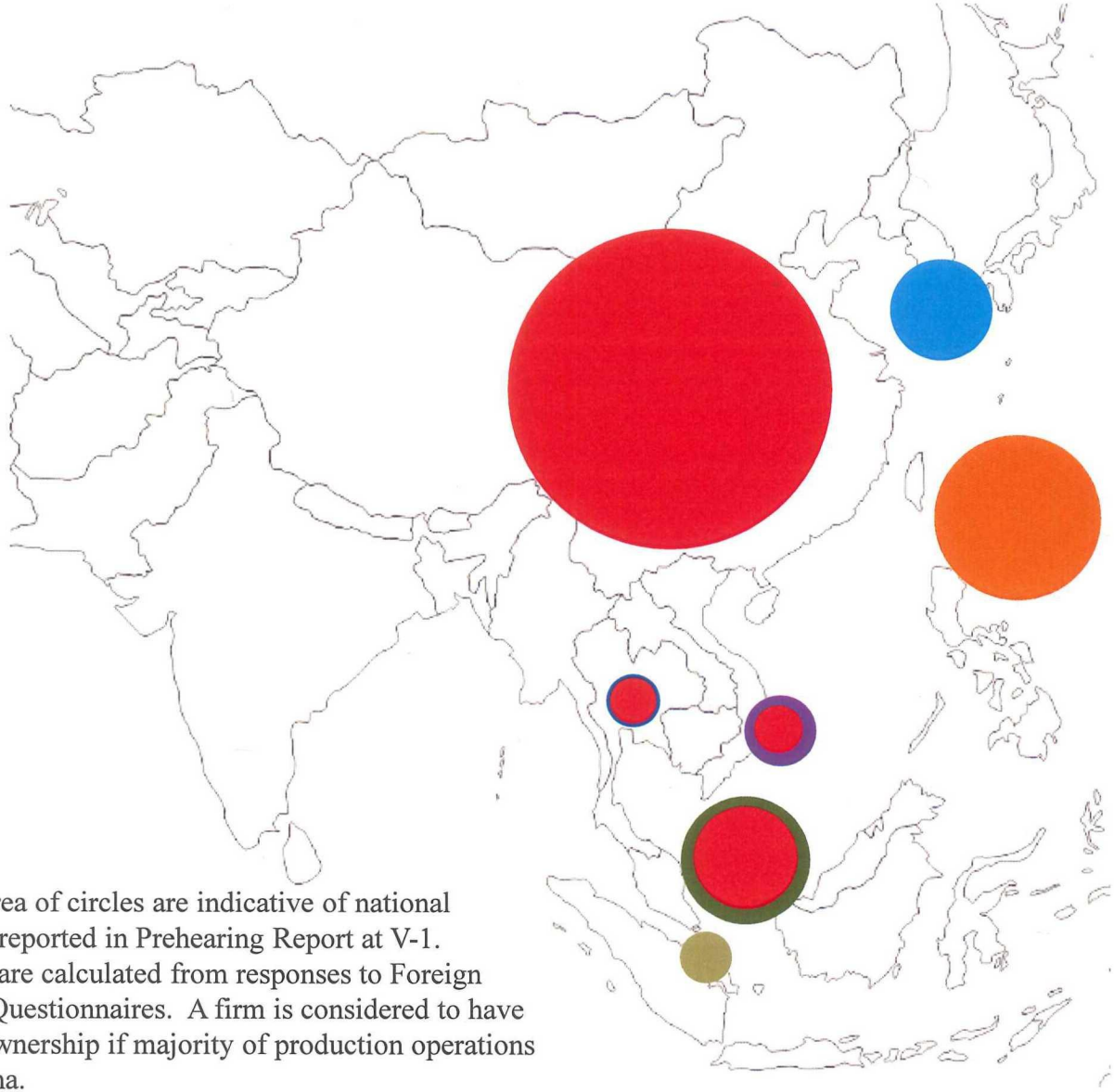
Production Capacity in East Asia - 2016



Source: Area of circles are indicative of national capacities reported in Prehearing Report at V-1.

Causation

Production Capacity in East Asia - 2016



China
Taiwan
Malaysia
Korea
Singapore
Vietnam
Thailand

Red circles in Malaysia, Thailand, and Vietnam represent capacities of firms whose primary production operations are in China.

Source: Area of circles are indicative of national capacities reported in Prehearing Report at V-1. China's share calculated from responses to Foreign Producer Questionnaires. A firm is considered to have Chinese ownership if majority of production operations are in China.

Causation

Global Capacity Additions Target the U.S. Market

Hanwha Q Cells Form 20-F 2016:

- "We believe **one of our competitive strengths is our significant manufacturing capacity outside of China that can effectively address potential risks arising from the current trade disputes between China and the United States** or the European Union."
- "However, some of our key competitors, including **Trina Solar Limited, JinkoSolar Holding Co., Ltd. and Canadian Solar, Inc., have expanded their manufacturing facilities outside of China as a means to circumvent potentially adverse effects from antidumping and countervailing duties imposed on PV products manufactured in China.**"

Source: Hanwah Q Cells. 2016 20-F at page 17.

Causation

Global Capacity Additions Target the U.S. Market

JA Solar Form 20-F 2014:

- "For example, we plan to set up a new cell manufacturing factory in Malaysia, which is expected to operate in the fourth quarter of 2015."

JA Solar Press Release, October 26, 2015:

- "These cells will primarily be used to manufacture JA Solar modules outside of China to provide competitive product solutions for certain overseas markets."

Source: JA Solar. 2014 20-F at page 13.

Causation

Global Capacity Additions Target the U.S. Market

Jinkosolar Form 20-F 2014:

- "In **February 18, 2015**, following the affirmative injury determination made by U.S. International Trade Commission, the U.S. Department of Commerce issued the antidumping duty order and countervailing duty order."

Jinkosolar Press Release March 19, 2015:

- "By expanding our production capacity geographically, we are further diversifying our global manufacturing layout and enhancing our competitiveness in overseas markets."

Jinkosolar 1st Quarter Highlights May 28, 2015:

- "Our Malaysia facility commenced operations on May 26, 2015 with the strong support of the local government as part of our globalized manufacturing strategy."

Source: JA Solar. 2014 20-F at page 13.

Causation

Global Capacity Additions Target the U.S. Market (Cont'd)

Third-Party Reports

- "Major Chinese companies will enhance their production capacities overseas in Malaysia, Thailand, India, Vietnam, the Netherlands, Germany, and Brazil in order to avoid ADs implemented following trade conflicts." International Energy Agency.
- "After a rapid increase of the annual production in China and Taiwan since 2006, a new trend emerged in 2014 to increase production capacities in other Asian countries like India, Malaysia, the Philippines, or Vietnam. It is worthwhile to note that the largest share of these investments is done by Chinese companies." European Commission, Joint Research Centre.

Source: IEA. Trends 2016 at page 48; Jager-Waldau, Arnulf. "Snapshot of Photovoltaics – March 2017." European Commission, Joint Research Centre. (May 2017) at 2.

Causation

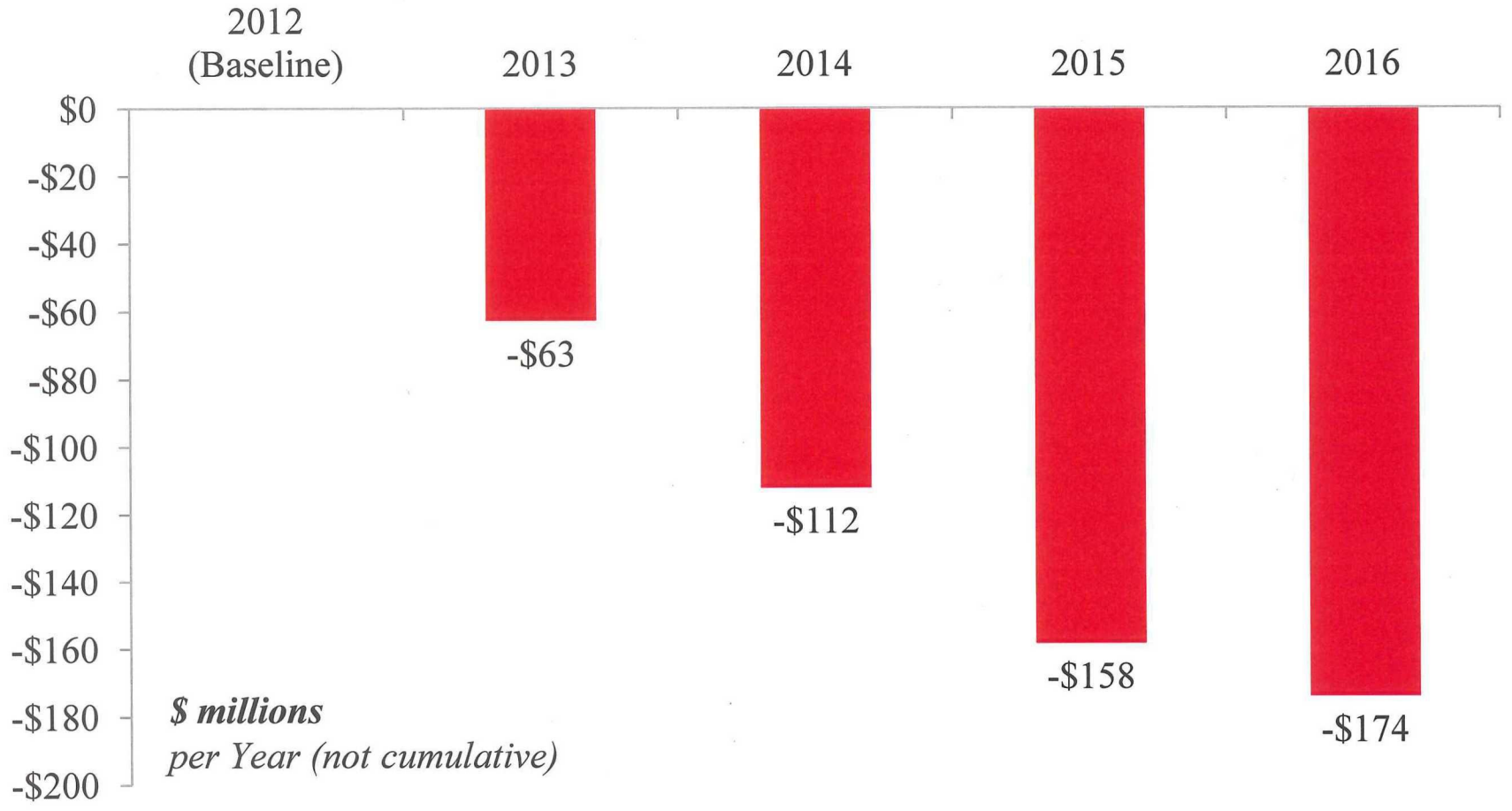
Dr. Balistreri Confirms Serious Injury Caused by Imports

- Increasing imports cost the domestic industry from $500 million to $775 million in revenue from 2013 to 2016.
- Increasing imports suppressed domestic industry revenues by 45% to 70% from 2013 to 2016.
- Several key assumption show that actual losses are likely much higher.
  - The model assumes no losses to the domestic industry in 2012, a year in which seven domestic firms went bankrupt and industry operating losses were $377 million with a negative 62.1 percent margin.
  - The model assumes, in one version, that domestic producers choose to leave the utility sector rather than being forced out by import prices below the cost of production.
  - The model fails to explicitly capture firm exit due to price suppression and depression – an important injury indicia.
  - The model fails to recognize that investment is lumpy, driven by the increasing optimal scale of new production facilities.

Source: Prehearing Brief for Injury Phase of Korea Photovoltaic Industry Association (KOPIA), Exhibit 6: Report of Professor Edward Balistreri, Table 2, at 4. Prehearing Report Table III-3, C-3 (Modules).

Causation

Respondent's Economist Estimates a Large Negative Impact of Imports



Source: Prehearing Brief for Injury Phase of Korea Photovoltaic Industry Association (KOPIA), Exhibit 6: Report of Professor Edward Balistreri, Table 2, at 4.

Causation

Investment Is "Lumpy"

- Investment and capacity expansions are "lumpy" in the CSPV industry, as evidenced by the massive expansions in Malaysia, Thailand, and Vietnam since 2014.
- The economically optimal size of facilities is increasing.
- Models such as COMPAS are therefore likely to underestimate economic effects of import competition.

Causation

Dr. Prusa: A Mystery

- Fails to address injury by focusing on domestic prices – not profits.
- Fails to incorporate import prices into the analysis.
- Black-box analysis:
  - Fails to provide data
  - Fails to provide code
  - Cannot be replicated by Commission Staff or Petitioners