United States Government Accountability Office

Report to Congressional Committees

February 2023

SUPPLY CHAIN RESILIENCE

Agencies Are Taking Steps to Expand Diplomatic Engagement and Coordinate with International Partners

Accessible Version

GAO-23-105534

GAO Highlights

Highlights of GAO-23-105534, a report to congressional committees.

February 2023

SUPPLY CHAIN RESILIENCE

Agencies Are Taking Steps to Expand Diplomatic Engagement and Coordinate with International Partners

Why GAO Did This Study

The COVID-19 pandemic and the war in Ukraine resulted in economic fallout that disrupted global supply chains and highlighted their vulnerabilities. Supply chain disruptions have resulted in shortages in multiple sectors, and continue to present economic challenges.

In February 2021, Executive Order 14017, "America's Supply Chains," directed a whole-of-government approach to assessing vulnerabilities in, and strengthening the resilience of, critical supply chains. It also highlighted the need for international coordination. Subsequent reviews recommended steps to strengthen supply chain resilience, including increased international coordination. Commerce, State, and USTR have key roles in advancing U.S. economic interests and responding to Executive Order 14017.

The CARES Act includes a provision for GAO to report on its ongoing monitoring and oversight efforts related to the COVID-19 pandemic. This report describes (1) Commerce, State, and USTR's diplomatic efforts to strengthen supply chains since the onset of the pandemic and (2) challenges coordinating with allies and partners. GAO reviewed agency documents and interviewed agency officials.

View GAO-23-105534. For more information, contact Kimberly Gianopoulos at (202) 512-8612 or gianopoulosk@gao.gov.

What GAO Found

Since the onset of the COVID-19 pandemic, the Departments of Commerce, State, and the Office of the U.S. Trade Representative have expanded diplomatic engagement on strengthening supply chains. As of October 2022, these agencies have initiated over a dozen engagements, including dialogues, working groups, and forums, to coordinate with allies and partners on supply chain resilience. The agencies have coordinated with allies and partners to develop supply chain principles and plans, which include efforts to address disruptions from the pandemic and the war in Ukraine. For example, the Supply Chain Ministerial Forum led to agreement on global supply chain principles. In addition, the U.S.-European Union Trade and Technology Council established a Secure Supply Chains working group that identified shared supply chain vulnerabilities.

U.S.-European Union Trade and Technology Council meeting, September 2021

Source: Department of State. | GAO-23-105534

According to agency officials, the primary challenges they face include (1) barriers to data collection, (2) limited flexibility in established trade agreements and programs, and (3) pandemic-related delays or virtual alternatives to meetings, which have hampered effective diplomacy. To address data collection challenges, agency officials said they have developed multiple data collection and analysis initiatives. These initiatives include mapping exercises in which participating stakeholders from the U.S. and partner nations share information about how goods flow through the production process. Also, in May 2022, agencies announced a pilot with European counterparts for a joint early alert system to more effectively share data on potential bottlenecks in the semiconductor supply chain. In addition, to address challenges and further improve coordination, agencies requested additional staffing resources to enhance diplomacy efforts related to supply chain resilience.

Contents

Abbreviations

Commerce	Department of Commerce
E.O.	Executive Order
EU	European Union
IPEF	Indo-Pacific Economic Framework for Prosperity
Quad	Quadrilateral Security Dialogue
State	Department of State
TTC	Trade and Technology Council
TFA	Trade Facilitation Agreement
UK	United Kingdom
USTR	Office of the U.S. Trade Representative
WHO	World Health Organization
WTO	World Trade Organization

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Congressional Committees

The COVID-19 pandemic and war in Ukraine resulted in economic fallout that disrupted global supply chains and highlighted their vulnerabilities. Supply chains—links enabling the production of finished goods and services from raw materials—faced significant disruptions, leading to product shortages and inflationary pressures.[1] For example, disruptions in semiconductor production led to a 2.3 million shortfall of automobiles produced in 2021 in North America, contributing to an inflation rate of almost 13 percent for new automobiles between March 2021 and March 2022.[2] According to the Office of the U.S. Trade Representative (USTR), the pandemic and the war in Ukraine have contributed to a "paradigm shift" emphasizing supply chain resilience in policymaking.[3]

On February 24, 2021, the President signed Executive Order (E.O.) 14017, "America's Supply Chains," directing a whole-of-government approach to assessing vulnerabilities in, and strengthening the resilience of, critical supply chains.[4] Subsequent reviews directed by E.O. 14017 identified limited international coordination as a driver of supply chain vulnerability, and recommended working with allies and partners to decrease global supply chain vulnerabilities.[5] These reviews recommended that the Departments of Commerce and State engage allies and partners on supply chain resilience, and recommended that

[1]Congressional Research Service (CRS), *Supply Disruptions and the U.S. Economy*, IN11926 (May 13, 2022).

[2]CRS, IN11926.

[3]Inside U.S. Trade, "USTR's Baltzan: China tariffs part of economic shift from efficiency to resiliency," accessed January 5, 2023, https://insidetrade.com/daily-news/ustr's-baltzan-china-tariffs-part-economic-shift-efficiency-resiliency.

[4]*America's Supply Chains*, Exec. Order 14017, 86 Fed. Reg. 11849 (Mar. 1, 2021).

[5]The White House, Department of Commerce, Department of Energy, Department of Defense, Department of Health and Human Services, *Building Resilient Supply Chains, Revitalizing American Manufacturing, and Fostering Broad-Based Growth: 100-Day Reviews under Executive Order 14017* (Washington, D.C.: June 2021).

USTR lead an interagency trade task force to help strengthen supply chain resilience.[6]

The CARES Act includes a provision for GAO to report on the federal response to the COVID-19 pandemic.[7] GAO, reporting under the CARES Act, has examined medical supply chain issues, including shortages of medical supplies needed to respond to the pandemic.[8] GAO has also reviewed supply chain issues specific to certain economic sectors. In June 2022, we reviewed federal efforts to advance critical minerals recovery and substitution, and recommended updating the national strategy for ensuring secure and reliable supplies of critical minerals.[9] In July 2022, we reported on policy considerations for reducing risks and mitigating shortages in light of the global semiconductor shortage that began in 2020.[10]

As part of GAO's body of work on supply chain issues, this report describes (1) Commerce, State, and USTR's diplomatic efforts to strengthen supply chains since the onset of the pandemic and (2) challenges coordinating with allies and partners.

To describe Commerce, State, and USTR's diplomatic efforts, we reviewed relevant documentary and testimonial information on the agencies' international coordination activities from March 2020 to October 2022. We obtained this information from Commerce's Bureau of Industry

[6]The 100-day supply chain reviews developed under Executive Order 14017 refer collectively to allies and partners as nations that are not geopolitical competitors with the United States for key products. The reviews state that supply chains used by the United States and its allies and partners could be strengthened if they were moved to friendly shores. However, the reviews do not identify a list of allies and partners. For the purposes of this report, we refer to allies and partners as described in the 100-day supply chain reviews. See The White House, et al., *Building Resilient Supply Chains.*

[7]Specifically, the CARES Act directs us to monitor and oversee the federal government's efforts to prepare for, respond to, and recover from the pandemic. Pub. L. No. 116-136, § 19010, 134 Stat. at 579-81 (2020). We have regularly issued reports on the federal response to the COVID-19 pandemic, available at https://www.gao.gov/coronavirus.

[8]GAO, *COVID-19: Federal Efforts Could Be Strengthened by Timely and Concerted Actions*, GAO-20-701 (Washington, D.C.: September 21, 2020); GAO, *COVID-19: Urgent Actions Needed to Better Ensure an Effective Federal Response*, GAO-21-191 (Washington, D.C.: November 30, 2020).

[9]GAO, *Critical Minerals: Building on Federal Efforts to Advance Recovery and Substitution Could Help Address Supply Risks*, GAO-22-104824 (Washington, D.C.: June 16, 2022).

[10]GAO, *Semiconductor Supply Chain: Policy Considerations from Selected Experts for Reducing Risks and Mitigating,* GAO-22-105923 (Washington, D.C.: July 26, 2022).

and Security and International Trade Administration, State's Bureau of Economic and Business Affairs, and USTR's Office of Small Business, Market Access, and Industrial Competitiveness, among other sources. We described examples of multilateral and bilateral engagements related to supply chain resilience to illustrate the range of agencies' diplomatic efforts.

To identify key challenges coordinating with allies and partners, as well as steps taken to address those challenges, we reviewed relevant documents and conducted interviews with officials from Commerce, State, and USTR. These interviews covered any challenges that the agencies identified as key to their efforts to coordinate with allies and partners on strengthening supply chains, as well as any steps they have taken to address these challenges since the pandemic began. For additional context regarding the challenges that the agencies identified, we conducted interviews with 17 experts in the semiconductor industry, one of the industries recently affected by supply chain disruptions. We selected experts based on subject matter expertise and the balance of perspectives they represented across the industrial, academic, nonprofit, and government sectors.[11]

We conducted this performance audit from December 2021 to February 2023 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

COVID-19 Pandemic and Supply Chain Disruptions

The COVID-19 pandemic caused severe health and economic impacts worldwide. The World Health Organization (WHO) has estimated that the global death toll associated with the COVID-19 pandemic between January 1, 2020 and December 31, 2021 was approximately 14.9

[11]Our July 2022 report summarized these experts' views on policy options that could reduce semiconductor supply chain risks and help mitigate future semiconductor shortages in the United States. See GAO-22-105923.

million.[12] The pandemic led to a global economic recession in 2020 and supply chain disruptions, which continue to constrain production and exacerbate inflationary pressures. In addition, the 2022 Russian invasion of Ukraine resulted in new supply shocks, including increases in world energy prices and the prices of certain commodities.[13] These economic challenges have raised concerns about the risk of a global economic slowdown.[14]

According to the Federal Reserve Bank of New York's Global Supply Chain Pressure Index, supply chains have faced greater disruptions, including production delays and elevated shipping costs, since the onset of the pandemic compared to recent decades.[15] Figure 1 shows monthly data, current as of August 4, 2022, for the index over the period January 1998 through July 2022.

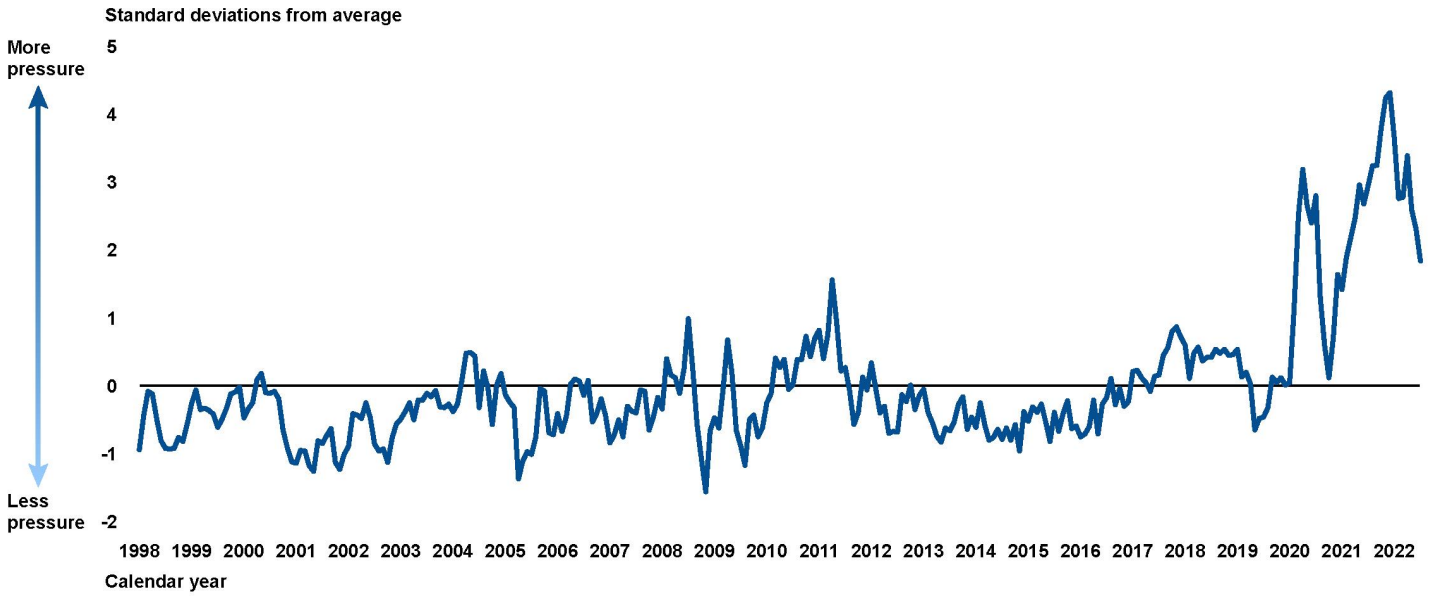
[12]World Health Organization, "Global excess deaths associated with COVID-19, January 2020 - December 2021" (May 2022), accessed October 27, 2022, https://www.who.int/data/stories/global-excess-deaths-associated-with-covid-19-january-2020-december-2021.

[13]CRS, IN11926.

[14]According to the International Monetary Fund's October 2022 *World Economic Outlook Update*, global economic growth was 6 percent in 2021, and is projected to be 3.2 percent in 2022 and 2.7 percent in 2023. See International Monetary Fund, "World Economic Outlook Update" (October 2022), accessed November 9, 2022, https://www.imf.org/en/Publications/WEO/Issues/2022/10/11/world-economic-outlook-october-2022.

[15]The Global Supply Chain Pressure Index integrates transportation cost data and manufacturing indicators to provide a gauge of global supply chain conditions. See Federal Reserve Bank of New York, "Global Supply Chain Pressure Index," accessed November 9, 2022, https://www.newyorkfed.org/research/policy/gscpi#/overview.

Figure 1: Global Supply Chain Pressure Index, January 1998 through July 2022



Source: GAO analysis of Federal Reserve Bank of New York data. | GAO-23-105534

Accessible Data for Figure 1: Global Supply Chain Pressure Index, January 1998 through July 2022

Calendar year	Standard deviations from average
"1998"	-0.94
28-Feb-1998	-0.44
31-Mar-1998	-0.08
30-Apr-1998	-0.12
31-May-1998	-0.49
30-Jun-1998	-0.81
31-Jul-1998	-0.92
31-Aug-1998	-0.93
30-Sep-1998	-0.92
31-Oct-1998	-0.76
30-Nov-1998	-0.82
31-Dec-1998	-0.56
"1999"	-0.26
28-Feb-1999	-0.06
31-Mar-1999	-0.35
30-Apr-1999	-0.33
31-May-1999	-0.36

Calendar year	Standard deviations from average
30-Jun-1999	-0.42
31-Jul-1999	-0.61
31-Aug-1999	-0.49
30-Sep-1999	-0.33
31-Oct-1999	-0.12
30-Nov-1999	-0.09
31-Dec-1999	-0.02
"2000"	-0.47
29-Feb-2000	-0.34
31-Mar-2000	-0.25
30-Apr-2000	0.09
31-May-2000	0.18
30-Jun-2000	-0.10
31-Jul-2000	-0.11
31-Aug-2000	-0.08
30-Sep-2000	-0.19
31-Oct-2000	-0.66
30-Nov-2000	-0.92
31-Dec-2000	-1.12
2001	-1.14
28-Feb-2001	-0.95
31-Mar-2001	-0.96
30-Apr-2001	-1.18
31-May-2001	-1.26
30-Jun-2001	-0.81
31-Jul-2001	-0.85
31-Aug-2001	-0.73
30-Sep-2001	-0.63
31-Oct-2001	-1.13
30-Nov-2001	-1.23
31-Dec-2001	-1.01
"2002"	-0.89
28-Feb-2002	-0.41
31-Mar-2002	-0.43
30-Apr-2002	-0.48
31-May-2002	-0.25
30-Jun-2002	-0.47

Calendar year	Standard deviations from average
31-Jul-2002	-0.86
31-Aug-2002	-0.96
30-Sep-2002	-0.93
31-Oct-2002	-1.13
30-Nov-2002	-0.77
31-Dec-2002	-0.56
"2003"	-0.49
28-Feb-2003	-0.38
31-Mar-2003	-0.25
30-Apr-2003	-0.50
31-May-2003	-0.21
30-Jun-2003	-0.21
31-Jul-2003	-0.11
31-Aug-2003	-0.16
30-Sep-2003	-0.07
31-Oct-2003	-0.31
30-Nov-2003	-0.32
31-Dec-2003	-0.27
"2004"	-0.38
29-Feb-2004	-0.27
31-Mar-2004	0.07
30-Apr-2004	0.48
31-May-2004	0.49
30-Jun-2004	0.44
31-Jul-2004	-0.32
31-Aug-2004	0.22
30-Sep-2004	-0.03
31-Oct-2004	-0.57
30-Nov-2004	0.01
31-Dec-2004	0.18
"2005"	-0.13
28-Feb-2005	-0.24
31-Mar-2005	-0.32
30-Apr-2005	-1.37
31-May-2005	-1.11
30-Jun-2005	-0.97
31-Jul-2005	-1.01

Calendar year	Standard deviations from average
31-Aug-2005	-0.75
30-Sep-2005	-0.04
31-Oct-2005	-0.08
30-Nov-2005	-0.69
31-Dec-2005	-0.72
"2006"	-0.41
28-Feb-2006	-0.67
31-Mar-2006	-0.45
30-Apr-2006	0.03
31-May-2006	0.10
30-Jun-2006	0.07
31-Jul-2006	-0.14
31-Aug-2006	0.08
30-Sep-2006	-0.53
31-Oct-2006	-0.40
30-Nov-2006	-0.19
31-Dec-2006	-0.44
"2007"	-0.84
28-Feb-2007	-0.72
31-Mar-2007	-0.50
30-Apr-2007	-0.75
31-May-2007	-0.30
30-Jun-2007	-0.37
31-Jul-2007	-0.40
31-Aug-2007	-0.06
30-Sep-2007	-0.08
31-Oct-2007	-0.65
30-Nov-2007	-0.45
31-Dec-2007	-0.17
"2008"	-0.34
29-Feb-2008	0.40
31-Mar-2008	0.16
30-Apr-2008	0.12
31-May-2008	-0.11
30-Jun-2008	0.25
31-Jul-2008	0.99
31-Aug-2008	0.25

Calendar year	Standard deviations from average
30-Sep-2008	-0.57
31-Oct-2008	-1.08
30-Nov-2008	-1.56
31-Dec-2008	-0.66
"2009"	-0.47
28-Feb-2009	-0.62
31-Mar-2009	-0.03
30-Apr-2009	0.68
31-May-2009	0.19
30-Jun-2009	-0.66
31-Jul-2009	-0.88
31-Aug-2009	-1.17
30-Sep-2009	-0.50
31-Oct-2009	-0.43
30-Nov-2009	-0.75
31-Dec-2009	-0.62
"2010"	-0.25
28-Feb-2010	-0.11
31-Mar-2010	0.41
30-Apr-2010	0.27
31-May-2010	0.39
30-Jun-2010	-0.05
31-Jul-2010	0.02
31-Aug-2010	0.39
30-Sep-2010	0.39
31-Oct-2010	0.73
30-Nov-2010	0.43
31-Dec-2010	0.70
"2011"	0.82
28-Feb-2011	0.40
31-Mar-2011	0.75
30-Apr-2011	1.56
31-May-2011	0.96
30-Jun-2011	0.22
31-Jul-2011	0.27
31-Aug-2011	-0.07
30-Sep-2011	-0.57

Calendar year	Standard deviations from average
31-Oct-2011	-0.39
30-Nov-2011	0.13
31-Dec-2011	-0.06
"2012"	0.34
29-Feb-2012	-0.04
31-Mar-2012	-0.40
30-Apr-2012	-0.30
31-May-2012	-0.70
30-Jun-2012	-0.67
31-Jul-2012	-0.68
31-Aug-2012	-0.13
30-Sep-2012	-0.23
31-Oct-2012	0.01
30-Nov-2012	-0.35
31-Dec-2012	-0.14
"2013"	-0.05
28-Feb-2013	-0.39
31-Mar-2013	-0.54
30-Apr-2013	-0.74
31-May-2013	-0.83
30-Jun-2013	-0.62
31-Jul-2013	-0.66
31-Aug-2013	-0.53
30-Sep-2013	-0.27
31-Oct-2013	-0.16
30-Nov-2013	-0.64
31-Dec-2013	-0.46
"2014"	-0.61
28-Feb-2014	-0.25
31-Mar-2014	-0.57
30-Apr-2014	-0.80
31-May-2014	-0.76
30-Jun-2014	-0.64
31-Jul-2014	-0.79
31-Aug-2014	-0.62
30-Sep-2014	-0.80
31-Oct-2014	-0.57

Calendar year	Standard deviations from average
30-Nov-2014	-0.96
31-Dec-2014	-0.38
"2015"	-0.52
28-Feb-2015	-0.31
31-Mar-2015	-0.39
30-Apr-2015	-0.27
31-May-2015	-0.53
30-Jun-2015	-0.82
31-Jul-2015	-0.39
31-Aug-2015	-0.67
30-Sep-2015	-0.41
31-Oct-2015	-0.22
30-Nov-2015	-0.63
31-Dec-2015	-0.59
"2016"	-0.75
29-Feb-2016	-0.71
31-Mar-2016	-0.60
30-Apr-2016	-0.21
31-May-2016	-0.71
30-Jun-2016	-0.27
31-Jul-2016	-0.17
31-Aug-2016	0.11
30-Sep-2016	-0.28
31-Oct-2016	-0.04
30-Nov-2016	-0.30
31-Dec-2016	-0.23
"2017"	0.21
28-Feb-2017	0.23
31-Mar-2017	0.12
30-Apr-2017	0.05
31-May-2017	-0.08
30-Jun-2017	0.14
31-Jul-2017	0.16
31-Aug-2017	0.45
30-Sep-2017	0.56
31-Oct-2017	0.80
30-Nov-2017	0.87

Calendar year	Standard deviations from average
31-Dec-2017	0.72
"2018"	0.60
28-Feb-2018	0.11
31-Mar-2018	0.48
30-Apr-2018	0.57
31-May-2018	0.37
30-Jun-2018	0.42
31-Jul-2018	0.42
31-Aug-2018	0.54
30-Sep-2018	0.48
31-Oct-2018	0.54
30-Nov-2018	0.45
31-Dec-2018	0.46
"2019"	0.54
28-Feb-2019	0.13
31-Mar-2019	0.20
30-Apr-2019	0.03
31-May-2019	-0.65
30-Jun-2019	-0.48
31-Jul-2019	-0.46
31-Aug-2019	-0.32
30-Sep-2019	0.13
31-Oct-2019	0.05
30-Nov-2019	0.12
31-Dec-2019	0.01
"2020"	0.05
29-Feb-2020	1.13
31-Mar-2020	2.51
30-Apr-2020	3.19
31-May-2020	2.65
30-Jun-2020	2.40
31-Jul-2020	2.80
31-Aug-2020	1.32
30-Sep-2020	0.60
31-Oct-2020	0.12
30-Nov-2020	0.70
31-Dec-2020	1.64

Calendar year	Standard deviations from average
"2021"	1.42
28-Feb-2021	1.89
31-Mar-2021	2.18
30-Apr-2021	2.47
31-May-2021	2.96
30-Jun-2021	2.68
31-Jul-2021	2.95
31-Aug-2021	3.24
30-Sep-2021	3.25
31-Oct-2021	3.80
30-Nov-2021	4.24
31-Dec-2021	4.32
"2022"	3.65
28-Feb-2022	2.76
31-Mar-2022	2.78
30-Apr-2022	3.39
31-May-2022	2.59
30-Jun-2022	2.31
31-Jul-2022	1.84

Pandemic-related shutdowns and labor shortages contributed to supply chain disruptions. According to the International Labor Organization, 93 percent of the world's workers resided in countries with COVID-19-related workplace restrictions, including required closures, in place as of early January 2021. In 2020, global working hours fell by 8.8 percent relative to the fourth quarter of 2019, equivalent to the loss of 255 million full-time jobs.[16]

Supply chain disruptions resulted in shortages in multiple sectors, including medical supplies and critical products such as semiconductors. In a national survey GAO conducted in October 2020, one-third to one-half of responding states reported ongoing shortages of some COVID-19-

[16]International Labor Organization, "ILO Monitor: COVID-19 and the World of Work" (January 25, 2021), accessed January 5, 2023, https://www.ilo.org/global/topics/coronavirus/impacts-and-responses/WCMS_767028/lang--en/index.htm.

related testing supplies.[17] In July 2022, GAO reported that the global semiconductor shortage that began in 2020 exposed long-term risks in the semiconductor supply chain and continues to affect a range of U.S. industries.[18]

The complexity of global supply chains can make them vulnerable to risks such as chokepoints. In our July 2022 report, we noted that the semiconductor supply chain—from research and development to design, production, and eventual incorporation into end user products—is extremely complex and geographically dispersed. For example, a semiconductor product may cross international borders as many as 70 times before reaching the final consumer.[19] Chokepoints can occur within a complex supply chain when production steps or critical materials and equipment are reliant on a limited number of suppliers.[20] See figure 2 for an example of a global semiconductor production process that represents a complex supply chain.

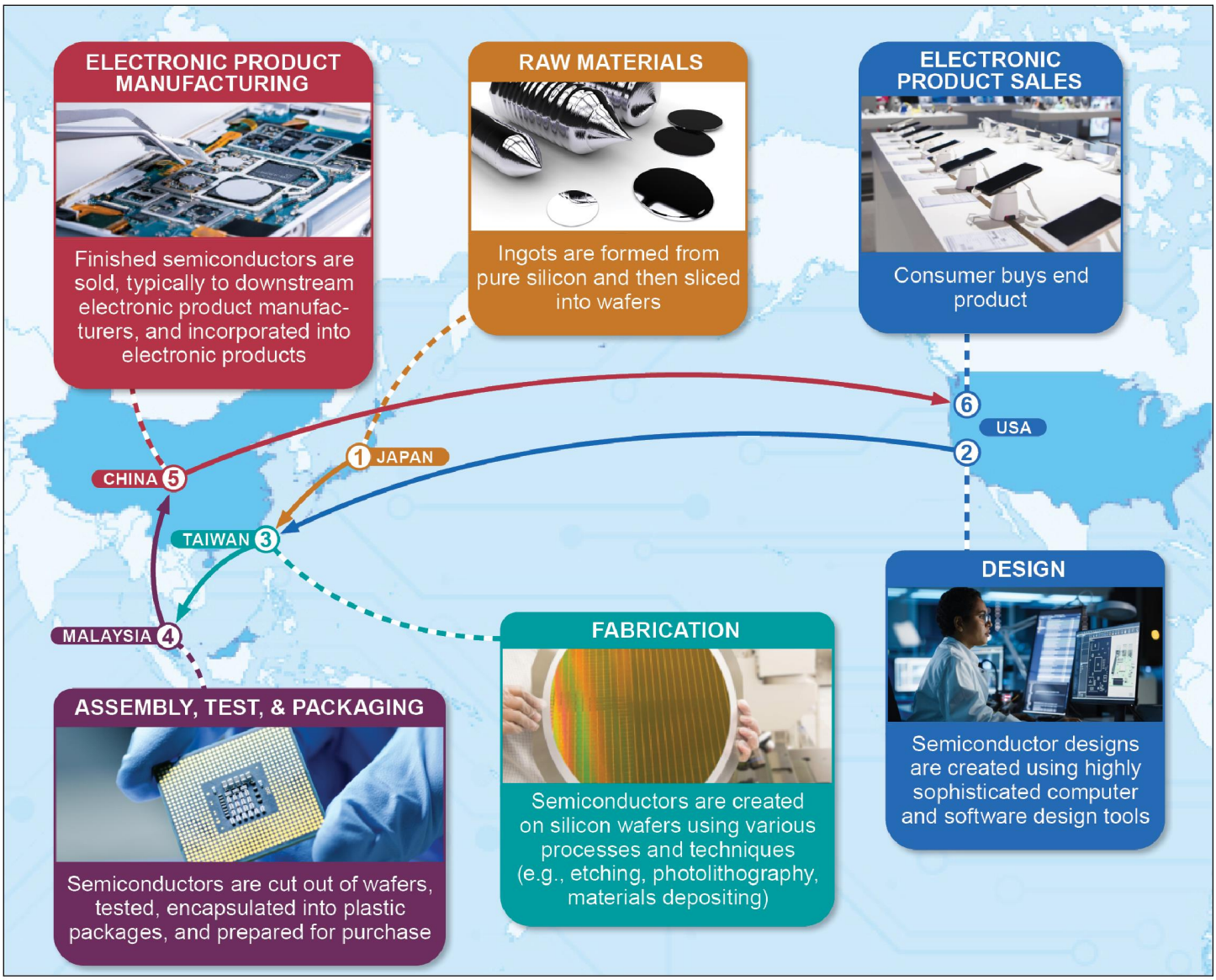
[17]GAO-21-191.

[18]GAO-22-105923.

[19]Accenture and Global Semiconductor Alliance, “Globality and Complexity of the Semiconductor Ecosystem” (Feb. 2020), accessed November 15, 2022, https://www.gsaglobal.org/globality-and-complexity-of-the-semiconductor-ecosystem/.

[20]For example, one Netherlands-based company is the only global supplier for specialized lithography equipment needed to manufacture the most advanced semiconductors. In addition, most leading-edge chips are manufactured in Taiwan.

Figure 2: Illustrated Steps of a Global Semiconductor Production Process

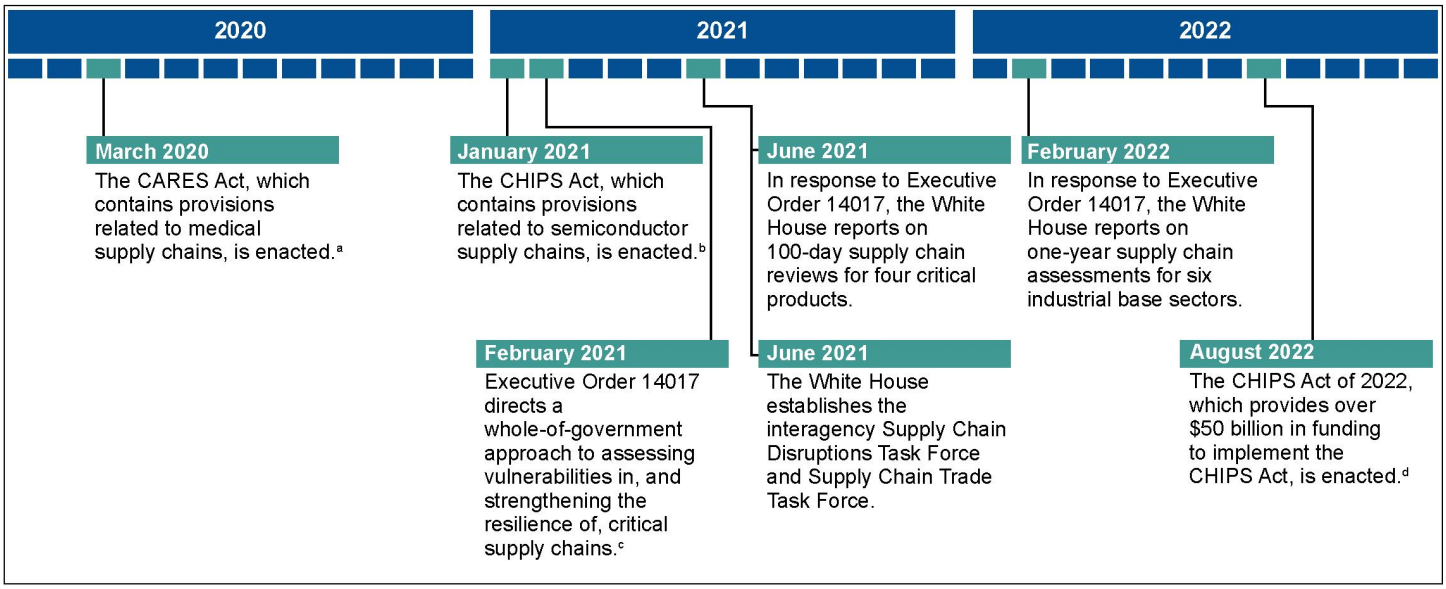


Sources: Congressional Research Service, Semiconductors: U.S. Industry, Global Competition and Federal Policy, R46581 (Oct. 26, 2020) which was adapted from information provided by the Semiconductor Industry Association (information), GAO analysis (presentation), and Gorodenkoff/I'm Thongchai/frog/22091967/bodnarphoto/stock.adobe.com (photos). | GAO-23-105534

Key Federal Efforts to Strengthen Supply Chains

The U.S. government has taken a number of steps to strengthen supply chains since the onset of the pandemic. Figure 3 provides a timeline of key federal efforts.

Figure 3: Timeline of Key Federal Efforts to Strengthen Supply Chains



Legend: Coronavirus Aid, Relief, and Economic Security = CARES; Creating Helpful Incentives to Produce Semiconductors = CHIPS.

Source: GAO analysis of agency documents and federal laws. | GAO-23-105534

[a]CARES Act, Pub. L. No. 116-136, 134 Stat. 281 (2020).

[b]William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021, Pub. L. No. 116-283, div. A, tit. XCIX, §§ 9901-9908, 134 Stat. 3388, 4843 (2021) (codified at 15 U.S.C. §§ 4651-4658).

[c]*America's Supply Chains*, Exec. Order 14017, 86 Fed. Reg. 11849 (Mar. 1, 2021).

[d]CHIPS Act of 2022, Pub. L. No. 117-167, div. A, 136 Stat.1366, 1372 (2022).

In February 2021, E.O. 14017, "America's Supply Chains," highlighted the importance of international coordination on supply chain resilience. In addition, the order tasked agencies with developing 100-day supply chain reviews of certain critical products, and one-year reviews of several industrial base sectors.

Issued in June 2021, the 100-day supply chain reviews assessed supply chain vulnerabilities for four critical products: semiconductor manufacturing and advanced packaging; large capacity batteries, like those for electric vehicles; critical minerals and materials; and

pharmaceuticals and advanced pharmaceutical ingredients.[21] The reviews recommended steps to strengthen the resilience of these supply chains, including increased international coordination. The reviews also recommended Commerce and State engage allies and partners on supply chain resilience in semiconductors, and strategic and critical materials, respectively.

Additionally in June 2021, the White House established two interagency supply chain task forces with roles for Commerce and USTR:

- **Supply Chain Disruptions Task Force.** Led by the Departments of Commerce, Transportation, and Agriculture, this task force is to focus on addressing supply chain disruptions in homebuilding and construction, semiconductors, transportation, and agriculture and food production.
- **Supply Chain Trade Task Force.** Led by USTR, this task force is to identify both unfair foreign trade practices that have eroded critical U.S. supply chains, and opportunities to use trade agreements to strengthen the collective supply chain resilience of the U.S. and its trade partners.

In February 2022, seven agencies published one-year supply chain reviews, assessing and addressing vulnerabilities for six industrial base sectors: defense, public health and biological preparedness, information and communications technology, energy, transportation, and agricultural commodities and food products. Some of the reviews also recommended international coordination on strengthening supply chain resilience.[22]

Commerce, State, and USTR Missions and Components

Commerce, State, and USTR have key missions and components to help advance U.S. economic interests, which include resilient supply chains.

[21]The White House, et al., *Building Resilient Supply Chains*.

[22]The seven agencies that authored the reports included the Departments of Agriculture, Commerce, Defense, Energy, Health and Human Services, Homeland Security, and Transportation. See The White House, "The Biden-Harris Plan to Revitalize American Manufacturing and Secure Critical Supply Chains in 2022" (February 24, 2022), accessed October 21, 2022, https://www.whitehouse.gov/briefing-room/statements-releases/2022/02/24/the-biden-harris-plan-to-revitalize-american-manufacturing-and-secure-critical-supply-chains-in-2022/.

- Commerce's mission is to create the conditions for economic growth and opportunity. Within Commerce, the International Trade Administration works to strengthen the international competitiveness of U.S. industry, promote trade and investment, and ensure fair trade and compliance with trade laws and agreements. The Bureau of Industry and Security works to advance U.S. national security, foreign policy, and economic objectives by ensuring an effective export control and treaty compliance system and promoting continued U.S. strategic technology leadership.
- State's mission is to protect and promote U.S. security, prosperity, and democratic values. The Bureau of Economic and Business Affairs is the department's functional bureau for economic and business issues, including efforts to create U.S. jobs and boost economic opportunities overseas.
- USTR's mission is to advance U.S. economic interests by developing and coordinating international trade, commodity, and direct investment policy, and overseeing negotiations with other countries. USTR's Office of Small Business, Market Access, and Industrial Competitiveness develops, negotiates, and implements U.S. trade policy related to market access for American manufacturers, and helps ensure that USTR's trade policy efforts address the challenges facing smaller American businesses.

According to agency officials, Commerce's International Trade Administration and Bureau of Industry and Security; State's Bureau of Economic and Business Affairs; and USTR's Office of Small Business, Market Access, and Industrial Competitiveness have led their respective agencies' diplomatic efforts related to E.O. 14017. Commerce, State, and USTR have focused on a variety of areas in their diplomatic engagement on supply chain resilience.

- Commerce officials said their diplomatic engagement has focused on semiconductors, and that they also support interagency efforts on supply chain resilience for other critical sectors. Commerce's work includes identifying supply chain bottlenecks, the effects of supply chain disruptions on U.S. businesses, and potential solutions to address these issues, according to agency officials.
- State officials said their diplomatic engagement has focused on the four critical products identified in the White House's 100-day supply chain reviews: semiconductor manufacturing and advanced packaging, large capacity batteries, critical minerals and materials, and pharmaceuticals and active pharmaceutical ingredients. They

also said State has focused on sharing information with allies and partners on efforts to strengthen critical supply chains, eliminate bottlenecks, and address shortages.

- USTR officials said their diplomatic engagement has focused on pandemic-related supplies in addition to the four critical products identified in the 100-day supply chain reviews. They also said USTR has focused on identifying ways to use free trade agreements, such as the United States-Mexico-Canada Agreement, to strengthen collaboration with allies and partners on supply chain challenges.

Commerce, State and USTR Expanded Diplomatic Engagement and Coordinated with Partners on Supply Chain Resilience

Commerce, State, and USTR have expanded diplomatic engagement on supply chains since the onset of the pandemic. As of October 2022, the agencies have initiated over a dozen dialogues, working groups, forums, and other channels to coordinate with allies and partners on supply chain resilience. The agencies have coordinated with allies and partners to develop supply chain principles and plans for action to strengthen supply chain resilience. These efforts aim to address challenges including disruptions from the pandemic and war in Ukraine.

Expanded Diplomatic Engagement on Strengthening Supply Chain Resilience

Commerce, State, and USTR have expanded their diplomatic engagements on strengthening supply chains since the onset of the pandemic. Prior to E.O. 14017, diplomatic engagement on supply chains included State-led efforts to coordinate internationally on securing critical minerals supplies.[23] USTR also coordinated with World Trade Organization (WTO) members on improving the movement of COVID-19-related medical goods through the WTO's Trade Facilitation Agreement

[23]In 2019, Commerce issued a national strategy to address critical minerals supply chain risks. See Department of Commerce, *A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals* (June 2019). Since the strategy's issuance, State has convened critical minerals working groups with partners including Brazil and Canada.

(TFA).[24] Since the signing of E.O. 14017, Commerce, State, and USTR have initiated over a dozen diplomatic engagements to coordinate with allies and partners on strengthening supply chain resilience. Agencies have launched diplomatic engagements including dialogues, working groups, and forums.

Table 1 provides examples of multilateral engagement on strengthening supply chain resilience led by Commerce, State, and USTR.

Table 1: Examples of Multilateral Supply Chain Engagements Led by Commerce, State, and USTR

Engagement	Launch Date	U.S. Partners	Lead Agencies	Goals
Quad Leaders' Summit	March 2021	Australia, India, Japan	Commerce, State	Cooperate on pandemic response and global health security, climate, critical and emerging technologies, cybersecurity, space, and infrastructure
U.S.-EU Trade and Technology Council	June 2021	EU	Commerce, State, USTR	Coordinate approaches to key global technology, economic, and trade issues, including supply chain resilience for key sectors
Summit on Global Supply Chain Resilience	Oct 2021	Australia, Canada, Democratic Republic of the Congo, EU, Germany, India, Indonesia, Italy, Japan, Mexico, Netherlands, Republic of Korea, Singapore, Spain, UK	State	Address near-term supply chain disruptions and build long-term supply chain resilience
COVID-19 Global Action Plan Meeting	Feb 2022	African Union, Australia, Canada, Colombia, EU, France, Germany, India, Indonesia, Italy, Japan, New Zealand, Republic of Korea, Saudi Arabia, Senegal, South Africa, Spain, UK, WHO	State	Respond to acute pandemic needs through six lines of global effort, including bolstering medical supply chain resilience
Indo-Pacific Economic Framework for Prosperity	May 2022	Australia, Brunei, Fiji, India, Indonesia, Japan, Malaysia, New Zealand, Philippines, Republic of Korea, Singapore, Thailand, Vietnam	Commerce, USTR	Establish high-standard commitments that will deepen U.S. economic engagement in the Indo-Pacific region on trade, supply chain resilience, clean energy, and tax and anticorruption
Minerals Security Partnership	June 2022	Australia, Canada, EU, Finland, France, Germany, Japan, Republic of Korea, Sweden, UK	State	Build robust, responsible critical mineral supply chains to support economic prosperity and climate objectives

[24]The TFA, which entered into force in 2017, contains provisions for expediting the movement, release, and clearance of goods. It also includes measures for addressing cooperation on trade facilitation and customs compliance issues, as well as related technical assistance and capacity building.

Engagement	Launch Date	U.S. Partners	Lead Agencies	Goals
Supply Chain Ministerial Forum	July 2022	Australia, Brazil, Canada, Costa Rica, Democratic Republic of the Congo, EU, France, Germany, India, Indonesia, Italy, Japan, Mexico, Netherlands, Republic of Korea, Singapore, Spain, UK	Commerce, State	Address near-term supply chain disruptions and build long-term supply chain resilience; include historically underrepresented groups in supply chain solutions

Legend: EU = European Union; Commerce = Department of Commerce; Quad = Quadrilateral Security Dialogue; State = Department of State; UK = United Kingdom; USTR = Office of the U.S. Trade Representative; WHO = World Health Organization

Source: GAO analysis of agency documents and testimonial evidence. | GAO-23-105534

Table 2 provides examples of bilateral engagement on strengthening supply chain resilience led by Commerce, State, and USTR.

Table 2: Examples of Bilateral Supply Chain Engagements Led by Commerce, State, and USTR

Engagement	Launch Date	U.S. Partners	Lead Agencies	Summary of Goals
U.S.-Mexico High-Level Economic Dialogue	Sept 2021	Mexico	Commerce, State, USTR	Build back from the impact of the global pandemic, promote inclusive trade and investment, prepare workforces for the future, and strengthen regional supply chains
U.S.-Singapore Partnership for Growth and Innovation	Oct 2021	Singapore	Commerce	Facilitate collaboration in digital economy and smart cities; energy and environmental technologies; advanced manufacturing and supply chain resilience; and healthcare
U.S.-Canada Supply Chain Working Group	Dec 2021	Canada	Commerce, NSC, State	Assess supply chain vulnerabilities, identify opportunities to strengthen bilateral supply chain security and resilience, and reinforce U.S.-Canada economic relationship
U.S.-Taiwan Technology Trade and Investment Collaboration Framework	Dec 2021	Taiwan	Commerce	Strengthen critical supply chains by promoting two-way investment, initially focusing on semiconductors, 5G, electric vehicles, sustainable energy, and cybersecurity
U.S.-UK Dialogue on the Future of Atlantic Trade	March 2022	UK	USTR	Support small-medium enterprise trade, digital trade, worker-centric trade, supply chain resilience, food security, and environmental and climate action
U.S.-Korea Supply Chain and Commercial Dialogue	May 2022	Republic of Korea	Commerce	Facilitate collaboration in digital economy; export controls; advanced manufacturing and supply chain resilience, including semiconductors; and healthcare and healthcare technology
U.S.-Thailand Supply Chain Resilience Engagement	July 2022	Thailand	State	Enhance information sharing, consultation, and program development to promote resilient supply chains
U.S.-Japan Economic Policy Consultative Committee	July 2022	Japan	Commerce, State	Realize peace and prosperity through the rules-based economic order, counter economic coercion, promote and secure critical and emerging technologies, and strengthen supply chain resilience

Legend: Commerce = Department of Commerce; NSC = National Security Council; State = Department of State; UK = United Kingdom; USTR = Office of the U.S. Trade Representative

Source: GAO analysis of agency documents and testimonial evidence. | GAO-23-105534

Commerce, State, and USTR officials said they solicit input from stakeholders, including the private sector, to inform supply chain resilience efforts. For example, Commerce and State included industry, labor, and civil society stakeholders in discussions at the Supply Chain Ministerial Forum in July 2022. USTR has also engaged private sector stakeholders on supply chain issues by convening industry roundtables, including roundtables with the U.S. textile and apparel industry in late 2021.[25]

Coordination with Partners to Develop Supply Chain Principles and Plans for Action

Commerce, State, and USTR have coordinated with allies and partners to develop supply chain principles and plans for actions to strengthen supply chain resilience, which include efforts to address disruptions from the pandemic and war in Ukraine.

Examples of efforts from multilateral engagements include:

- **Quadrilateral Security Dialogue (Quad).** At the inaugural leader-level summit in March 2021, Quad partners, comprising Australia, India, Japan, and the U.S., launched the Critical and Emerging Technologies Working Group to facilitate cooperation on critical technologies and their supply chains. At the fourth leaders' summit in May 2022, Quad partners issued a statement of principles on critical technology supply chains. According to the statement, the principles will guide joint efforts to make critical technology supply chains more resilient, and are organized around security, transparency, autonomy, and integrity.[26]

[25]See U.S. Trade Representative (USTR), "USTR Roundtable Highlights the United States-Central America Supply Chain for Textiles and Apparel" (October 29, 2021), accessed November 4, 2022, https://ustr.gov/about-us/policy-offices/press-office/press-releases/2021/october/ustr-roundtable-highlights-united-states-central-america-supply-chain-textiles-and-apparel; USTR, "Readout of USTR Deputies' Roundtable Discussion with the American Apparel & Footwear Association" (December 1, 2021), accessed November 4, 2022, https://ustr.gov/about-us/policy-offices/press-office/press-releases/2021/december/readout-ustr-deputies-roundtable-discussion-american-apparel-footwear-association.

[26]For more information, see Japan Ministry of Foreign Affairs, "Common Statement of Principles on Critical Technology Supply Chains," accessed October 28, 2022, https://www.mofa.go.jp/files/100347806.pdf.

- **U.S.-EU Trade and Technology Council (TTC).** At the TTC's first meeting in September 2021, shown in figure 4, the U.S. and EU established the scope of work for supply chain and trade working groups.[27] The Secure Supply Chains Working Group, chaired by Commerce and State, was tasked with cooperating on strategies to promote supply chain resilience and diversification, among other things. At the TTC's second ministerial meeting in May 2022, the Secure Supply Chains Working Group defined a work plan focused on semiconductors, clean energy, critical minerals, and pharmaceuticals. The group identified shared vulnerabilities and risks in solar panel, semiconductor, and rare earth magnet supply chains. The Global Trade Challenges Working Group, chaired by USTR, announced plans to launch a dialogue on promoting diversified trade in agricultural commodities and inputs to strengthen the resilience of global food production and address food security in the wake of Russia's invasion of Ukraine.[28]

[27]The White House, "U.S.-EU Trade and Technology Council Inaugural Joint Statement" (September 29, 2021), accessed October 6, 2022, https://www.whitehouse.gov/briefing-room/statements-releases/2021/09/29/u-s-eu-trade-and-technology-council-inaugural-joint-statement/.

[28]The White House, "U.S.-EU Joint Statement of the Trade and Technology Council" (May 16, 2022), accessed November 4, 2022, https://www.whitehouse.gov/wp-content/uploads/2022/05/TTC-US-text-Final-May-14.pdf.

Figure 4: U.S.-EU Trade and Technology Council Ministerial Meeting (September 2021)

Source: Department of State. | GAO-23-105534

- **Supply Chain Ministerial Forum.** At the July 2022 Supply Chain Ministerial Forum, the U.S. and 18 partners released a joint statement, agreeing to cooperate on building supply chain resilience by following global supply chain principles of transparency, diversity, security, and sustainability.[29]
- **Indo-Pacific Economic Framework for Prosperity (IPEF).** At the September 2022 IPEF ministerial meeting, the U.S. and 13 partners agreed to establish criteria for identifying critical sectors and goods through IPEF's supply chain pillar. They also agreed to increase resiliency and investment in critical sectors and goods, and to strengthen supply chain logistics, among other things.[30]

[29]Department of State, "Joint Statement on Cooperation on Global Supply Chains" (July 20, 2022), accessed October 28, 2022, https://www.state.gov/supply-chain-ministerial-joint-statement/.

[30]Indo-Pacific Economic Framework for Prosperity, "Ministerial Statement for Pillar II of the Indo-Pacific Economic Framework for Prosperity" (September 9, 2022), accessed November 2, 2022, https://www.commerce.gov/sites/default/files/2022-09/Pillar-II-Ministerial-Statement.pdf.

Examples of efforts from bilateral engagements include:

- **U.S.-Mexico High-Level Economic Dialogue.** In September 2021, the U.S. and Mexico established a working group to coordinate on identifying critical sectors involved in cross-border supply chains, and to conduct stakeholder outreach to increase investment and strengthen supply chain resilience. The working group agreed to collaborate on the U.S.-Mexico semiconductor and information and communications technology supply chain ecosystems. Figure 5 shows the Secretary of State and Secretary of Commerce in Mexico in September 2022.

Figure 5: U.S.-Mexico High-Level Economic Dialogue Press Meeting (September 2022)

Source: Department of State. | GAO-23-105534

- **U.S.-Japan Economic Policy Consultative Committee.** At its inaugural ministerial meeting in July 2022, the committee developed a plan of action for the year. According to the plan, the U.S. and Japan will seek to advance efforts under the Japan-U.S. Commercial and Industrial Partnership and other frameworks to foster supply chain

resilience, particularly in semiconductors, batteries, and critical minerals.[31]

Agencies Face Challenges Coordinating With Partners on Supply Chain Resilience and Have Taken Steps to Improve Coordination

Commerce, State, and USTR reported challenges coordinating supply chain resilience engagements with allies and partners since the onset of the pandemic. According to agency officials, the primary challenges they face are (1) barriers to data collection, (2) limited flexibility in established trade agreements and programs, and (3) COVID-19-related delays or virtual alternatives to meetings, which have impeded effective diplomacy. These challenges affect the agencies' abilities to coordinate in multilateral and bilateral engagements, as well as with the private sector. Agency officials also identified steps they have taken, and continue to take, to address challenges and improve coordination.

Challenges to Diplomatic Coordination

Barriers to Data Collection

The private sector controls the majority of supply chains. Commerce, State, and USTR officials said that a lack of accessible data about private sector supply chains has limited their ability to work with allies and partners to identify and address vulnerabilities. Companies may be reluctant to share data on their supply chains due to business confidentiality concerns, or may not have the data. Moreover, the complexity of particular supply chains has limited agencies' abilities to collect and manage data to assess supply chain structure and resiliency.

State and USTR officials noted that while they use data to inform their diplomatic engagements with allies and partners on supply chains, they generally rely on Commerce and other agencies or organizations for data collection and analysis on specific markets and industries. However,

[31]Department of State, "Joint Statement of the U.S.-Japan Economic Policy Consultative Committee: Strengthening Economic Security and the Rules-Based Order" (July 29, 2022), accessed October 17 2022, https://www.state.gov/joint-statement-of-the-u-s-japan-economic-policy-consultative-committee-strengthening-economic-security-and-the-rules-based-order/.

Commerce officials noted that their data collection efforts and tools often rely on data voluntarily provided by businesses. According to agency officials and semiconductor industry experts we met with, businesses are sometimes reticent to share data for fear that any leak of sensitive information may weaken their competitiveness. Additionally, semiconductor industry experts noted that businesses struggle to compile accurate information about their own supply chains. This has made it difficult for both companies and the government entities relying on their data to project potential shortages.

Limited Flexibility in Established Trade Tools

According to USTR officials, current U.S. trade agreements generally were not designed to address supply chain disruptions or build resiliency. USTR officials noted that U.S. trade agreements historically focused on trade liberalization and maximizing economic efficiency. The officials added that trade agreements and trade preference programs can serve as tools for addressing supply chain resiliency concerns, but this may require renegotiating current agreements, negotiating new agreements, or modifying trade preference programs. In addition, they said that for long-term resilience, the U.S. will need policies that incentivize allies and partners to work with the U.S. to build resilient supply chains.

For example, the officials pointed to the 2017 TFA as an initiative that provides a multilateral opportunity for reducing supply chain bottlenecks abroad. USTR officials stated that they believe the trade facilitation measures included in the TFA can help alleviate some supply chain disruptions. In 2020, USTR supported accelerating the implementation of the TFA to address critical pandemic supply chain disruptions. However, the officials noted that in 2017, USTR unsuccessfully attempted to include a provision in the TFA to eliminate the requirement in some countries for in-person consulate visits to obtain permission to import. The USTR officials noted that this requirement contributes to supply chain bottlenecks by hindering the ability of both U.S. and foreign businesses to import goods.

USTR officials said that future trade negotiations could also address supply chain resilience. As an example, “rules of origin” could serve as a mechanism in free trade agreements for the U.S. government to promote supply chain resilience with trading partners, according to the officials. The officials said that, for example, these rules specify what percentage of a good’s components must be produced within the agreement partners’

countries to qualify for the lower tariffs offered by an agreement.[32] The officials added that the U.S. government might use free trade agreement rules of origin to incentivize supply in partner countries and promote resilience that will benefit U.S. consumers. However, they noted that rules of origin are negotiated when free trade agreements are first established, meaning USTR must either renegotiate the rules of origin in existing agreements to specifically address supply chain resilience or wait until they negotiate new agreements.

COVID-19-Related Constraints on Effective Diplomacy

According to State and USTR officials, COVID-19 outbreaks forced delays or virtual alternatives to in-person multilateral and bilateral meetings, which impeded diplomatic coordination. For example, the WTO rescheduled its twelfth Ministerial Conference, initially planned for December 2021, to June 2022. According to USTR officials, this delayed one of USTR's principal opportunities to discuss supply chain issues with trading partners.[33] Although delayed, USTR officials noted that holding the conference in person enabled members to reach agreement on a broader set of ministerial decisions and declarations than might otherwise have been negotiated virtually. State officials said that while access to virtual platforms has helped the department gather allies and partners more quickly, virtual engagement often lacks opportunities to build relationships with foreign officials and limits chances to observe how countries respond to various proposals. USTR officials added that, in their view, efforts to conduct meaningful multilateral and bilateral trade negotiations remotely have generally been less efficient and effective than in-person negotiations.

Steps to Address Challenges and Improve Diplomatic Coordination

Agency officials told us they have taken steps to address data challenges and improve their ability to coordinate with allies and partners on strengthening supply chain resilience. In particular, agencies have

[32]For example, under the 2020 United States-Mexico-Canada Agreement "rules of origin" for passenger vehicles and light or heavy trucks, seventy percent of a vehicle producer's purchases of both steel and aluminum, during a specified time period, must be for goods that originate in North America to qualify for the lower tariff offered by the agreement.

[33]The WTO Ministerial Conference usually meets every two years and is the WTO's top-most decision-making body, according to the WTO.

developed multiple data collection and analysis initiatives, and they have asked for additional staffing resources dedicated to supply chain issues.

Data Collection and Analysis

Commerce, State, and USTR officials told us that they have taken steps to enhance diplomatic coordination on supply chain resilience through data collection and analysis. For example:

- **Request for information in the Federal Register.** Commerce's data collection initiatives focus on global semiconductor supply chains, according to Commerce officials. Commerce issued a Federal Register notice in September 2021 requesting information from interested parties, including domestic and foreign semiconductor manufacturers. The notice's goal was to identify supply chain data gaps and bottlenecks and accelerate information flow across various segments of the supply chain.[34] In January 2022, Commerce published summary findings from its review of over 150 responses to the notice.[35] Commerce officials noted that they used the results to enhance coordination and information sharing with partners on supply chain vulnerabilities. According to State officials, State supported Commerce's efforts to gather responses to the notice, and the responses received have also helped inform State's engagements with partners abroad.
- **Reporting from overseas posts.** State's overseas posts compile information related to supply chains that the department regularly shares with other agencies, the National Security Council, and the

[34]Notice of Request for Public Comments on Risks in the Semiconductor Supply Chain, 86 Fed. Reg. 53031 (Sept. 24, 2021). According to the notice, the department was seeking responses from interested parties, including domestic and foreign semiconductor design firms, semiconductor manufacturers, materials and equipment suppliers, as well as semiconductor intermediate and end-users.

[35]See Department of Commerce, "Results from Semiconductor Supply Chain Request for Information," January 25, 2022, accessed October 31, 2022, https://www.commerce.gov/news/blog/2022/01/results-semiconductor-supply-chain-request-information. Commerce officials said that they were unable to share country-level results with allies and partners due to the small sample size and sensitivity concerns.

National Economic Council, according to State officials.[36] The officials noted that this information complements other U.S. government data collection efforts and media reports that may help to identify the causes of supply chain disruptions. For example, embassies and consulates worldwide provided information to help assess whether pandemic-related lockdowns had disrupted critical suppliers.

- **Mapping exercises.** According to State officials, State has worked with other agencies, including Commerce, and with allies and partners at international engagements, to map supply chains for various critical industries. In these exercises, participating stakeholders from the U.S. and partner nations share information about how goods flow through the production process. For example, State and Commerce supported efforts to map supply chains for clean energy technologies and critical minerals following the TTC September 2021 inaugural meeting. State and Commerce also supported efforts to conduct mapping exercises for semiconductors at the Quadrilateral Security Dialogue Leaders' Tokyo Summit in May 2022.[37] In addition, according to its June 2022 progress report, the U.S.-Canada Supply Chain Working Group has initiated a Joint Economic Analysis to map supply chains.[38] Under this effort, Commerce and Statistics Canada have collaborated on data sharing to identify potential vulnerabilities and improve supply chain resilience.
- **Early alert systems.** In fall 2021, Commerce and State established a microelectronics early alert system to gather information voluntarily provided by semiconductor manufacturers and customers and

[36]State's overseas posts include U.S. embassies, consulates, and other posts that represent the United States in foreign countries. The National Security Council is the President's principal forum for national security and foreign policy decision making with his or her national security advisors and cabinet officials, and the President's principal arm for coordinating these policies across federal agencies. The National Economic Council, part of the Executive Office of the President, advises the President on U.S. and global economic policy.

[37]The U.S.-EU Trade and Technology Council (TTC) was established in June 2021 with a key goal of leading global, like-minded partners in promoting an open, interoperable, secure, and reliable digital space, and in developing and protecting tomorrow's technology. The Quadrilateral Security Dialogue, or Quad, was established in the wake of the 2004 Indian Ocean tsunami to coordinate humanitarian assistance and disaster relief, and has evolved into a regional partnership which cooperates on diverse 21st century challenges. The Quad consists of the U.S. President and the Australian, Indian, and Japanese Prime Ministers.

[38]The White House, "U.S.-Canada/Canada-U.S. Supply Chains Progress Report," June 2022.

mitigate pandemic-related disruptions to the global supply of chips and components. Commerce officials said that they share information gathered from this initiative with foreign governments, as appropriate. In addition, at the May 2022 TTC meeting, Commerce, USTR, and European counterparts announced a pilot for a joint early alert system for the semiconductor supply chain that would allow participants to more effectively share data on potential bottlenecks.[39]

- **Interagency and private sector input.** Commerce, State, and USTR officials added that the recent expansion in diplomatic engagement has also provided an opportunity to gather input and facilitate support from stakeholders, including other agencies and the private sector, for data collection and analysis efforts. For example, Commerce held a U.S. stakeholder roundtable with a dozen organizations representing industry, civil society, think tanks, and academia to inform Commerce's engagement with the EU through the TTC.[40]

Requests for Additional Staff to Address Supply Chain Challenges

Both Commerce and State have requested additional staff to address supply chain resiliency challenges (see table 3).

[39]In the May 2022 TTC Meeting, Commerce, USTR, and European counterparts announced that the pilot early alert system would include discussions about how to ensure business confidentiality in the information shared between governments. Following the December 2022 TTC Meeting, Commerce and the EU announced that, as a result of the pilot, they were entering into an administrative arrangement to implement an early warning mechanism to address and mitigate semiconductor supply chain disruptions in a cooperative way.

[40]Commerce officials added that they regularly solicit stakeholder input on supply chain issues through industry meetings, the Bureau of Industry and Security's technical advisory committees, and the International Trade Administration's trade advisory committees.

Table 3: Agency Fiscal Year 2023 Budget Requests for Additional Staff to Enhance Supply Chain Resilience and Related Diplomacy Efforts

Agency	Existing positions (FY 2022)	Requested positions (FY 2023)	Additional appropriation requested	Purpose
Commerce – International Trade Administration: Industry and Analysis	239 positions	+38 positions (16% increase)	+$10.85 million (15% increase)	Fulfill new requirements on supply chain resilience across manufacturing and services industries covered by International Trade Administration industry experts, including the semiconductor industry
Commerce – Bureau of Economic Analysis	495 positions	+15 positions (3% increase)	+$5.22 million (5% increase)	Establish a global supply and value chain unit that will develop analytical tools and industry data and analysis that track and describe the composition of products sold both domestically and abroad
State – Bureau of Economic and Business Affairs	177 positions	+7 positions (4% increase)	+$4.68 million (12% increase)	Support the bureau's increasing work on the global economic recovery and countering strategic competitors, including efforts to reopen the U.S. economy and secure supply chains, among other efforts

Source: GAO analysis of documents from the Departments of Commerce and State. | GAO-23-105534

Commerce requested additional staff to expand its supply chain analyses across the sectors and markets that the International Trade Administration covers. Specifically, according to Commerce officials, Commerce requested 38 positions for the International Trade Administration's Industry and Analysis unit to increase the analytical capabilities for the bureau's semiconductor initiatives, implement related recommendations stemming from E.O. 14017, and support other analysis. In addition, the Bureau of Economic Analysis requested 15 positions to establish a new unit to conduct supply chain analysis across domestic and international markets.

State requested additional staff to address short-term disruptions and long-term resilience in supply chains, among other tasks. Specifically, State's Bureau of Economic and Business Affairs requested seven positions to diversify critical supply chains, and to address other challenges. According to State officials, the additional staff will augment the bureau's supply chain diplomacy efforts.

Agency Comments

We provided a draft of this report for review and comment to Commerce, State, and USTR. The agencies did not provide formal comments on the draft report. We received technical comments from each agency, which we incorporated into the draft, as appropriate.

We are sending copies of this report to the appropriate congressional committees, the Secretaries of Commerce and State, and the U.S. Trade Representative. In addition, the report is available at no charge on the GAO website at http://www.gao.gov.

If you or your staff have any questions about this report, please contact Kimberly Gianopoulos at (202) 512-8612 or gianopoulosk@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix I.

Kimberly Gianopoulos
Director, International Affairs and Trade

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House of Representatives
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The Honorable Richard E. Neal
Ranking Member
Committee on Ways and Means
House of Representatives

Appendix I: GAO Contact and Staff Acknowledgments

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In addition to the contacts named above, Judith Williams (Assistant Director), Katherine Forsyth (Analyst-in-Charge), Elisabeth Helmer (Analyst-in-Charge), Samuel Huang, Timothy Smith, Larissa Barrett, Neil Doherty, James Boohaker, Justin Fisher, Lilia Chaidez, and Nicole Willems made key contributions to this report.

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