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2022 Commercial Products Economic Summit

December 19, 2022

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What to Expect During Congress' Lame Duck Session

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Your Presenter



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A Look Back at 2022

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Looking Ahead to 2023 & 2024

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Questions?

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Assurance / Tax / Advisory

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Navigating the Carbon Sequestration Tax Credit in the Inflation Reduction Act of 2022

Commercial Products
Economic Summit

Presenter



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Agenda

- Introductions

- Framework of the 45Q Credit & Key Qualification Elements

- Potential Business Impacts

- How 45Q May Support ESG & Other Business Objectives

- Questions

45Q Framework & Key Qualification Elements

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- What is 45Q?
 - Credit against income tax
 - Part of the general business credits, *i.e.*, IRC 38 credits
 - Election to shift who is allowable taxpayer for credit
 - NEW: Ability to make direct pay election for 45Q credit attributable to equipment originally placed in service after December 31, 2022
 - NEW: Ability to make election to transfer all or a portion of the 45Q credit to unrelated person in exchange for cash, applicable tax years beginning after December 31, 2022

45Q Framework & Key Qualifications

- Key Qualification Elements

Within the United States or a possession of the United States

Carbon Capture

- Captured by taxpayer
- Using carbon capture equipment
- Originally placed in service at a qualified facility

Carbon Disposal

- Disposed in secure geological storage & not used, or
- Used tertiary injectant qualified enhanced oil or natural gas recovery project & disposed in secure geological storage, or
- Utilized by taxpayer in a manner described under paragraph (f)(5)

45Q Framework & Key Qualifications: Capture

- Carbon capture equipment
 - Generally, all components of property used to capture or process CO₂ until the CO₂ is transported for disposal, injection, or utilization
 - Separating, purifying, drying, &/or capturing CO₂ that would otherwise be released into the atmosphere by industrial facility
 - Removing CO₂ from the atmosphere via direct air capture; or
 - Compressing or otherwise increasing the pressure of CO₂
 - May be owned by taxpayer other than taxpayer that owns industrial facility if equipment originally placed in service on or after February 9, 2018

45Q Framework & Key Qualifications: Capture

- Carbon capture equipment
 - Additional carbon capture equipment – physical modification or equipment addition that results in an increase of CO₂ capture design capacity & does not meet 80/20 rule
 - New carbon capture equipment – physical modification or equipment addition with a cost that satisfies the 80/20 rule

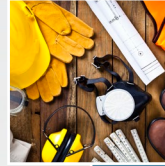
45Q Framework & Key Qualifications: Capture

- Originally place in service at “qualifying facility”



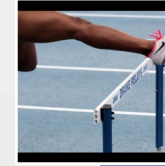
Type

- Industrial facility that produces CO₂ that would otherwise be released into the atmosphere as a greenhouse gas, from fuel combustion source or fuel cell, a manufacturing process, or fugitive CO₂ emission source
- OR
- Direct air capture facility



Construction Period

- Construction begins before January 1, 2033 & EITHER
- Construction of carbon capture equipment begins before such date
- OR
- Original planning & design for such facility includes installation of carbon capture equipment



Capture Threshold

- At which carbon capture equipment is placed in service that captures the requisite annual thresholds of CO₂

45Q Framework & Key Qualifications: Capture

Facility Type	BEFORE (Construction begins before 8/16/2022)	AFTER IRA (Construction begins on or after 8/16/2022)
Direct Air Capture Facility	<ul style="list-style-type: none"> Not less than 100,000 metric tons of qualified carbon 	<ul style="list-style-type: none"> Not less than 1,000 metric tons of qualified carbon
Electricity Generating Facility	<ul style="list-style-type: none"> If facility emits <500,000 metric tons of CO₂, then not less than 25,000 metric tons of qualified carbon utilized in manner described, or Not less than 500,000 metric tons of qualified carbon 	<ul style="list-style-type: none"> Not less than 18,750 metric tons of qualified carbon & not less than 75% of the baseline CO₂ production of electric generating unit with respect to any capture equipment for such unit
Other Industrial Facility	<ul style="list-style-type: none"> If facility emits <500,000 metric tons of CO₂, then not less than 25,000 metric tons of qualified carbon utilized in manner described, or Not less than 100,000 metric tons of qualified carbon 	<ul style="list-style-type: none"> Not less than 12,500 metric tons of qualified carbon

* All references to metric tons are with respect to a tax year, ex. 500,000 metric tons emitted during the tax year



45Q Framework & Key Qualifications: Dispose

- Secure geological storage
 - Includes but not limited to storage at deep saline formations, oil & gas reservoirs, & unmineable coal seams. Must be under conditions as Secretary has determined in issued regulations
 - Adequate security measures for geological storage such that qualified CO₂ does not escape into the atmosphere as provided in regulations

45Q Framework & Key Qualifications: Dispose

- Secure geological storage
 - All documentation required by Form 8993
 - Enhanced oil & gas
 - If taxpayer reports to EPA, self-certify volume
 - If taxpayer determines volumes pursuant to CSA/ANSI ISO 27916:2019, certification of documentation by independent engineer or geologist required
 - Affidavit & specific statements must be included
 - **Failure to submit complete documentation or certification will result in disallowance of all 45Q credit for the tax year**

45Q Framework & Key Qualifications: Utilize

- Utilization means
 - Fixation through photosynthesis or chemosynthesis
 - Chemical conversion to material or chemical compound in which CO₂ is securely stored, or
 - Use for any other purpose for which commercial market exists (except as tertiary injectant enhanced oil or natural gas recovery project)

45Q Framework & Key Qualifications: Utilize

- Utilization
 - Measurement: metric tons based on analysis of life cycle greenhouse emissions (LCA) that were
 - Captured & permanently isolated from the atmosphere, or
 - Displaced from being emitted into atmosphere

45Q Framework & Key Qualifications: Utilize

- Utilization: LCA
 - Must be documented in a written LCA report
 - In conformity with International Organization for Standardization (ISO) 14040:2006, Environmental management – Life cycle assessment – Principles and framework; as well as ISO 14044:2006, Environmental management – Life cycle assessment – Requirements and guidelines
 - Must be performed or verified by qualified independent third party
 - Submitted under penalties of perjury
 - LCA report will be reviewed by Department of Energy & advise taxpayer of approval. **Approval must be received prior to claiming of 45Q credits**

45Q Framework & Key Qualifications: Credit

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- Applicable dollar amount per metric ton each year for the 12-year period beginning on date equipment originally placed in service
 - Thresholds for qualified facility must be met annually
 - Annualized amount used for year placed in service & the year in which the 12-year period ends
 - “Additional carbon capture equipment” rate applied to incremental carbon captured & disposed/used

45Q Framework & Key Qualifications: Credit

Qualified Facility Type	Disposal/Use	Placed in service before February 9, 2018	Placed in service February 9, 2018 through December 31, 2022	Placed in service on or after December 31, 2022 (Base Rate)
Industrial	Not used & Disposed in secure geological storage	\$20	\$22.66–\$50 based on linear interpolation* \$50 plus inflation factor**	\$17* \$17 plus inflation factor**
Industrial	Used as tertiary injectant & Disposed in secure geological storage	\$10	\$12.83–\$35 based on linear interpolation* \$35 plus inflation factor**	\$12* \$12 plus inflation factor**
Industrial	Utilized in manner described	\$10	\$12.83–\$35 based on linear interpolation* \$35 plus inflation factor**	\$12* \$12 plus inflation factor**

*For tax years beginning in calendar year after 2016 & before 2027

**For tax years beginning in calendar year after 2026

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45Q Framework & Key Qualifications: Credit

Qualified Facility Type	Disposal/Use	Placed in service before February 9, 2018	Placed in service February 9, 2018 through December 31, 2022	Placed in service on or after December 31, 2022 (Base Rate)
Direct Air Capture	Not used & Disposed in secure geological storage	\$20	\$22.66–\$50 based on linear interpolation* \$50 plus inflation factor**	\$36* \$36 plus inflation factor**
Direct Air Capture	Used as tertiary injectant & Disposed in secure geological storage	\$10	\$12.83–\$35 based on linear interpolation* \$35 plus inflation factor**	\$26 per metric ton* \$26 plus inflation factor**
Direct Air Capture	Utilized in manner described	\$10	\$12.83–\$35 based on linear interpolation* \$35 plus inflation factor**	\$26 per metric ton* \$26 plus inflation factor**

*For tax years beginning in calendar year after 2016 & before 2027

**For tax years beginning in calendar year after 2026

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45Q Framework: Credit Multiplier

- Applicable to property placed in service after December 31, 2022
- If requirements met, credit amount will be base rate multiplied by 5
- Critical time periods/dates
 - Placed in service after December 31, 2022
 - Beginning of construction period
 - Date Secretary publishes guidance on the multiplier wage & apprenticeship requirements & the subsequent 60-day period

45Q Framework: Credit Multiplier

Property	Construction Period	Additional Requirements
Qualified Facility as well as any carbon capture equipment placed in service at <u>such facility</u>	Construction <u>of facility</u> begins <u>on or after</u> the date that is 60 days after the Secretary publishes guidance on wage & apprenticeship requirements (AFTER, AFTER)	Both wage & apprenticeship requirements must be met
Carbon capture equipment	Construction of equipment begins <u>after</u> the date that is 60 days after the Secretary publishes guidance on wage & apprenticeship & is installed at qualified facility the construction of which began before such date (AFTER, BEFORE)	Both wage & apprenticeship requirements must be met with respect to equipment
Carbon capture equipment	Construction of equipment begins <u>before</u> the date that is 60 days <u>after</u> the Secretary publishes guidance on wage & apprenticeship requirements & is installed at qualified facility the construction of which began before such date (BEFORE, BEFORE)	None



45Q Framework: Credit Multiplier

- Wage
 - Laborers & mechanics employed by contractors & subcontractors are paid wages not less than applicable prevailing wage as determined by Secretary of Labor
 - Construction as well as any alteration or repair within the 12-year credit period
 - Other per guidance including requirements for recordkeeping or information reporting for purposes of administration

45Q Framework: Credit Multiplier

- Apprenticeship requirements “similar to 45(b)(8)”
 - Thresholds for percentage of total labor hours performed by qualified apprentices
 - Construction as well as any alteration or repair within designated period
 - Applicable contractors & subcontractors
- Other per guidance including requirements for recordkeeping or information reporting for purposes of administration

45Q Framework: Credit Multiplier Effect

Qualified Facility Type	Disposal/Use	Placed in service on or after December 31, 2022 with Multiplier
Industrial	Not used & Disposed in secure geological storage	\$85* \$85 plus inflation factor**
Direct Air Capture	Not used & Disposed in secure geological storage	\$180* \$180 plus inflation factor**
Industrial	Used as tertiary injectant & Disposed in secure geological storage	\$60* \$60 plus inflation factor**
Direct Air Capture	Used as tertiary injectant & Disposed in secure geological storage	\$130 per metric ton* \$130 plus inflation factor**
Industrial	Utilized in manner described	\$60* \$60 plus inflation factor**
Direct Air Capture	Utilized in manner described	\$130 per metric ton* \$130 plus inflation factor**

*For tax years beginning in calendar year before 2027

**For tax years beginning in a calendar year after 2026

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45Q Credit – How to Claim

- A taxpayer must claim the credit on Form 8933 filed with the federal income tax return or Form 1065 & annually report to the IRS the following information
 - Name & location of the qualified facilities at which the qualified carbon oxide was captured; &
 - If the taxpayer is claiming the 45Q credit on an amended federal income tax return, an amended Form 1065, or AAR, as applicable, the taxpayer must state “AMENDED RETURN FOR SECTION 45Q CREDIT” at the top of the amended federal income tax return, the amended Form 1065, or the AAR, as applicable
- The taxpayer must do this for each year the taxpayer is eligible for the credit. The existence of each contract & the parties involved must be reported to the IRS annually on Form 8933 by each party to the contract, regardless of which party is claiming the credit
 - Failure of an electing taxpayer or a credit claimant to satisfy the reporting requirements in a taxable year will result in the inability to claim the credit with respect to any qualified carbon oxide that is disposed of, injected, or utilized in the taxable year pursuant to that particular election
- If the taxpayer elects to allow the 45Q credit in whole or in part to another taxpayer, additional information is required annually to the IRS. The taxpayer must include an election statement on Form 8933 & provide each credit claimant with a copy of the electing taxpayer’s Form 8933

45Q Credit – Transfer of Credit

There are numerous disclosures associated with the Form 8933 if the taxpayer is electing to allow the credit to another taxpayer. These include

- The name, address, taxpayer identification number of the credit claimant
- The name, address, & taxpayer identification number of each taxpayer making an election under §45Q(f)(3)(B) to allow the credit to the credit claimant
- The location & e-GGRT ID number(s) (if available) of each qualified facility where qualified carbon oxide was captured
- The location & e-GGRT ID number(s) (if available) of each secure geological storage facility where the qualified carbon oxide is disposed of or injected, or each site where the qualified carbon oxide is utilized
- The full dollar amount of §45Q credits attributable to each electing taxpayer prior to the election & the corresponding metric tons of carbon oxide
- The dollar amount of §45Q credits that each electing taxpayer is allowing the credit claimant to claim & the corresponding metric tons of carbon oxide
- A copy of the electing taxpayer's Form 8933. The credit claimant must include this Form 8933 with its timely filed Federal income tax return or Form 1065 (including extensions). The election may not be filed with an amended Federal income tax return, an amended Form 1065, or an AAR, as applicable, after the prescribed date (including extensions) for filing the original Federal income tax return or Form 1065 for the year, with the exception of amended Federal income tax returns, amended Forms 1065, or AARs, as applicable, for any taxable year ending after February 9, 2018, & beginning on or before January 13, 2021

The failure of the electing taxpayer or credit claimant to properly report on Form 8933 will result in the credit being unavailable for the taxable year

45Q Credit – Recent Changes to Credit Transfer Rules

- For tax years beginning after 12/31/2022, the Inflation Reduction Act of 2022 allowed an eligible taxpayer to elect to transfer all or a portion of an eligible credit determined as to the eligible taxpayer for any tax year to an unrelated taxpayer. The transferee taxpayer is treated as the taxpayer for the purpose of the credit or a portion of the credit
- The Section 45Q(a) credit for carbon oxide sequestration is available for transfer. The election must be made by the due date (including extensions) for the return for the tax year for which the credit is determined or, if later, **180 days after August 16, 2022**. The election is irrevocable. For the Section 45Q(a) credit, the election is made separately for each facility & for each tax year during the 10-year period beginning on the date the facility was originally placed in service, or the 12-year period, in the case of carbon capture equipment
- There are special rules regarding S-corporations. An S-corporation that owns a facility or property directly can make the election to transfer the credit. The amount received as consideration for the transfer is treated as tax-exempt income for purposes of IRC 1366. A S-corporation shareholder cannot make an election to transfer the credit for a facility or property that is held directly by an S-corporation. An eligible taxpayer could transfer a credit to an unrelated S-corporation, which would then allocate the credit amount to its shareholders. But S shareholders who are allocated credits cannot later transfer them to an eligible taxpayer

45Q Credit – Treatment of Credit Transfer Payment

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- With respect to any amount paid by a transferee taxpayer to an eligible taxpayer as consideration for the transfer of credit, such consideration
 1. Shall be required to be paid in cash
 2. Shall not be included in gross income of the eligible taxpayer
 3. With respect to the transferee taxpayer, shall not be deductible

45Q Credit – Treatment of Credit Transfer Payment

Partnerships & S Corporations

- In the case of any eligible credit determined with respect to any facility or property held directly by a partnership or S corporation, if such partnership or S corporation makes an election under subsection (a) (in such manner as the Secretary may provide) with respect to such credit
 - A. any amount received as consideration for a transfer described in such subsection shall be treated as tax-exempt income for purposes of sections 705 & 1366
 - B. a partner's distributive share of such tax-exempt income shall be based on such partner's distributive share of the otherwise eligible credit for each taxable year
- Coordination with application at partner or shareholder level

In the case of any facility or property held directly by a partnership or S corporation, no election by any partner or shareholder shall be allowed under subsection (a) with respect to any eligible credit determined with respect to such facility or property

45Q Credit – Credit Recapture

- Regulations provide that the recapture amount will be accounted for in the tax year that the leakage is identified & reported. The amount of the credits that can be recaptured depends upon the length of the lookback period & the amount of the leakage. The regulations provide rules for allocating the recapture when the credit was split among multiple taxpayers, as well as when a leak occurs in a storage site which multiple independent taxpayers have utilized (multiple units)
- The credits can be recaptured if the leaked carbon exceeds the amount of carbon disposed of or utilized in that taxable year. If the leaked amount is lesser than that captured, it does not trigger recapture. The taxpayer can simply claim the tax credit for the net amount disposed or utilized
- The recapture period begins on the date of first injection of qualified carbon oxide for disposal in secure geological storage or use as a tertiary injectant. The recapture period ends on the earlier of three years after the last taxable year in which the taxpayer claimed a §45Q credit or was eligible to claim a credit that it elected to carry forward, or the date monitoring ends under the requirements of the standards described in Reg. §1.45Q-3(b)(1) or Reg. §1.45Q-3(b)(2). Leaks due to issues not in control of the taxpayer, such as volcanic activity or a terrorist attack, are exempted from recapture

45Q Closing Thoughts & Key Takeaways

- Significant lowering of the thresholds to qualify expands the number of taxpayers who may benefit
- Significant increase in dollar amounts with multiplier significantly enhances the value of these credits
- Applicability of credit to taxpayers other than facility owners, as well as new provisions for direct pay (refundability) & credit transfers, allows taxpayers to monetize benefits for financing of investments which align with ESG & other business objectives

Questions?

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Linking Strategies to Your Supply Chain

Commercial Products
Economic Summit

Presenters



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Agenda

- Supply Chain Current State
- Supply Chain Overview
- Current Challenges
- Solutions & Case Study
- Questions

Supply Chain in the Media

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How Broken Is the Supply Chain?

Fall 2021

Supply chain challenges have NOT been in short ... supply

CNN BUSINESS Markets Tech Media Success Perspectives Videos

BEFORE/THE BELL

How bad are supply chains? Costco is renting ships

CNN.com 9/24/2021

MarketWatch.com 10/11/2021

Walmart, Target, Home Depot and other large retailers are chartering ships to bypass supply chain problems. Will the strategy save Christmas?

Biden administration looks to fix supply shortages with Walmart, UPS and FedEx by Christmas

USAToday.com 10/13/2021

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How Broken Is the Supply Chain?

Winter 2022

China's Omicron Outbreak Is Even Worse News for Global Supply Chains

- China facing multiple outbreaks of delta and omicron variants
- Two cities are now locked down, more are facing restrictions

Bloomberg.com 1/11/2022

WSJ.com 1/11/2022

Omicron, Supply-Chain Troubles to Slow Growth, World Bank Says

Bank forecasts 4.1% growth in 2022, down from 5.5% last year

"Despite supply chain problems, rising inflation, labor shortages and the omicron variant, retailers delivered a positive holiday experience to pandemic-fatigued consumers and their families."

NRF.com 1/14/2022

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How Broken Is the Supply Chain?

Today

According to recent **Salesforce research**, 51% of consumers plan to purchase fewer holiday gifts this year. Factors such as inflation, rising interest rates and supply chain shortages are all expected to create new concerns that go beyond the lingering COVID-19 pandemic.

ChainStoreAge.com 7/29/2022

JPMorgan.com 5/25/2022

Forbes

One Type Of Inflation Is Caused By Supply Chain Issues (And That Is A Good Thing)

“... Federal Reserve does not have to do anything to bring the inflation rate down; inflation will decrease by itself when the supply issues are resolved – as they inevitably are over time”

Forbes.com 10/1/2022

What's Behind The Global Supply Chain Crisis?

Looking inside supply chain issues and logistics within a geopolitical context.

“The Russia-Ukraine conflict, wider geopolitical implications & renewed COVID-19 lockdowns in China have compounded an already bleak global supply chain situation”

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Supply Chain Overview

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Supply Chain: The Basics

Supply Chain – the sequence of processes involved in the production & distribution of a commodity. – Oxford Dictionary

Key processes include

- Sourcing
- Inbound Receiving
- Manufacturing
- Warehousing
- Wholesaling
- Retail
- Distribution
- Customer/Demand



- Sourcing
- Production
- Warehousing
- Distribution
- Retail
- Servicing

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Current Challenges

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Post-COVID-19 Impact

Key Challenges

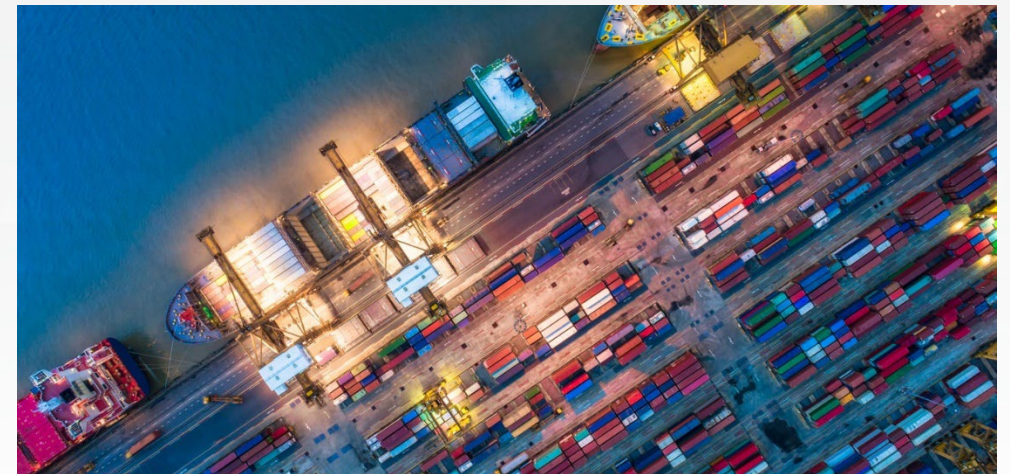
- In the immediate onset of COVID-19, there were abrupt shocks to international supply that quickly reverberated worldwide
- Changes in demand for household products resulted in shortages of essential goods, product inputs
- Safety in high contact/proximity work environments had to be redesigned
- Unprecedented unemployment & the shutdown of industries not deemed essential

Emerging & Hidden Risk

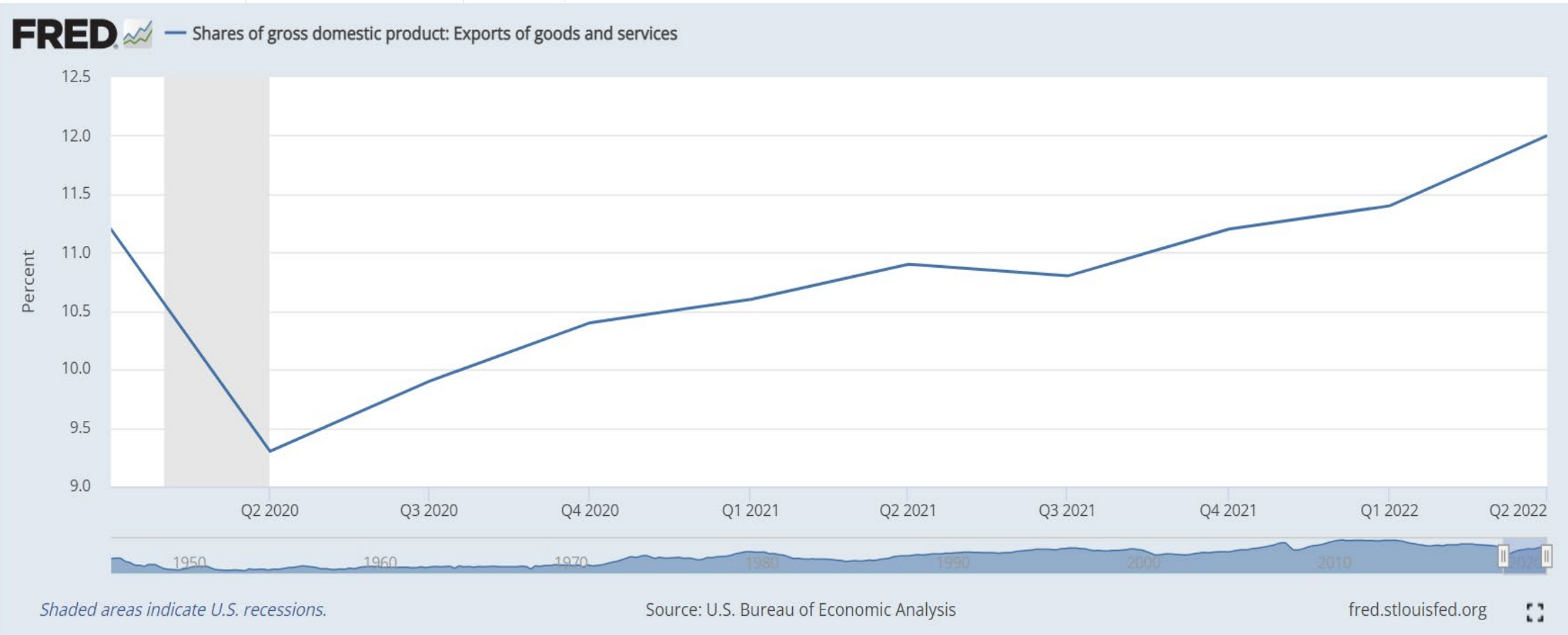
- The modern supply chain was not equipped to address such a disruption. Just in time, processes had allowed firms to avoid costly inventory cost; however, this has proven to be problematic & detrimental to firms as a result of COVID-19
- Concentrations of key component suppliers
- Stresses on IT infrastructure (HQ is remote now)

How Firms Are Adapting

- Firms are taking a deeper dive into their end-to-end supply chain to identify areas of vulnerabilities, not just focusing on their strategic direct suppliers but also sub-suppliers
- Diversifying their supply chain, including regional sourcing
- Rethinking the remote environment
- Increasing & stockpiling inventory that is key & where there are no alternative suppliers immediately available



COVID-19's Impact on U.S. Trade



Current Challenges

Sourcing



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Remain Hyper-Aware of Sourcing

- Core commodities concentrated in a geographical area
- Planning & forecasting
- Hedging key resources/currencies (future/forward contracts)
- Sourcing from multiple vendors
- Vendor management scorecards & compliance
- Quality

Current Challenges

Distribution



Remain Hyper-Aware of Distribution

- Time, cost, & quality
- Business partner/supplier data (interconnectivity)
- Planning & forecasting
- Supply chain transparency
- Interruptions due to weather/natural disasters
- Labor
- Fuel & inflationary impact

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Current Challenges

Energy



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Remain Hyper-Aware of Energy

Spikes in pricing & demand

Energy sources

Clean energy transition

Disruption

Current Challenges

Labor



Remain Hyper-Aware of Talent Gap Costs

- 56% of manufacturers reported increasing base wages by 1-5%*
- 22% increased base pay rates by 6-10%*
- Unemployment rates rose to 3.7% as of August 2022**
- Workers are demanding more schedule flexibility
- Industries must develop strategies to grow more rewarding careers & ensure the workforce has the skill sets needed
- Utilize technology more

[*https://www.natlawreview.com/article/manufacturing-during-labor-shortage-how-manufacturers-have-been-innovating-ways-to](https://www.natlawreview.com/article/manufacturing-during-labor-shortage-how-manufacturers-have-been-innovating-ways-to)

[**https://www.bls.gov/news.release/pdf/empst.pdf](https://www.bls.gov/news.release/pdf/empst.pdf)

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Current Challenges

Geopolitical



Remain Hyper-Aware of Trade Barriers

Impacts of trade barriers on supply chains

- Uncertainty
- Success = ability to adapt
- Supply disruption
- Relocation
- Quality

Impact of isolationist trends

- Limits sourcing options & investment
- Pricing/cost pass through
- Logistics/slowdown

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Current Challenges

Sustainability/ESG



Remain Hyper-Aware of Sustainability

- Climate, governmental, & investor/societal changes & trends are rapidly focusing on a company's sustainability practices
- Employers that have high employee satisfaction & are attractive employment destinations tend to have lower carbon emissions, more diversity, & make a greater effort to understand employee feelings*
- SEC regulations considerations
- Talent will expect organizations to be mindful of larger purposes

Inclusion/Diversity

Social Injustice

Environment

*<https://www.marshmclennan.com/insights/publications/2020/may/esg-as-a-workforce-strategy.html>

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Current Challenges

Retail



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Remain Hyper-Aware of Retail

- Brick & mortar vs. e-commerce
- Consumer trends
- Data (shipments received)
- Pricing
- Flexibility

Top U.S. Trading Partners: August 2022 YTD (in Billions USD)



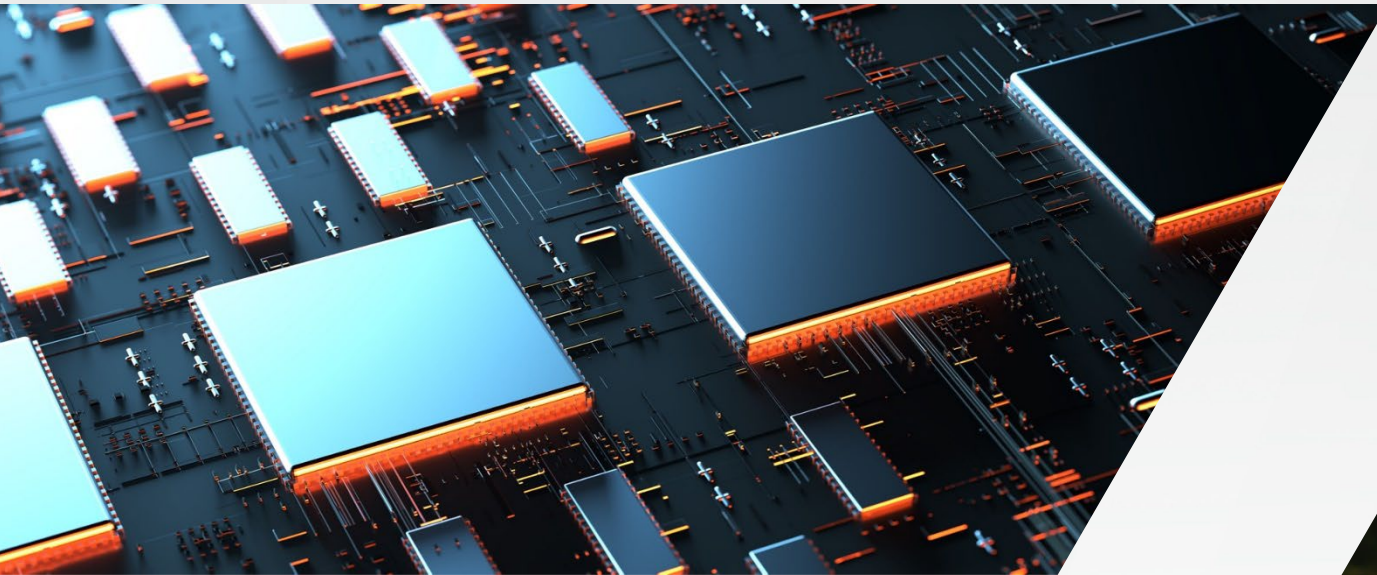
TOP TRADING PARTNERS – AUGUST 2022

Source: <https://www.census.gov/foreign-trade/statistics/highlights/top/top2208yr.html>

Year-to-Date Total Trade

Rank	Country	Exports	Imports	Total Trade	Percent of Total Trade
---	Total, All Countries	1,367.2	2,179.0	3,546.2	100.0%
---	Total, Top 15 Countries	949.0	1,685.2	2,634.2	74.3%
1	Canada	237.3	299.5	536.8	15.1%
2	Mexico	217.9	302.2	520.1	14.7%
3	China	96.8	368.8	465.6	13.1%
4	Japan	54.2	98.1	152.3	4.3%
5	Germany	48.2	91.7	139.9	3.9%
6	Korea, South	47.6	75.9	123.5	3.5%
7	Vietnam	7.9	87.0	94.9	2.7%
8	Taiwan	28.9	61.7	90.5	2.6%
9	India	31.0	58.7	89.8	2.5%
10	United Kingdom	48.8	40.7	89.6	2.5%
11	Netherlands	47.0	23.9	70.9	2.0%
12	France	29.6	37.0	66.6	1.9%
13	Switzerland	24.2	41.5	65.7	1.9%
14	Italy	18.8	45.6	64.4	1.8%
15	Ireland	10.6	53.0	63.6	1.8%

Emerging Technologies



TECHNOLOGIES

- AI & ML
- 5G
- Robotics/Driverless
- Blockchain
- IOT

LOOKING AHEAD

- New paths & best practices
- Pilot & implementation projects
- Full automation & optimization of supply chain



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Supply Chain Solutions






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Case Study

- Client Profile
- Supply Chain Pain Points
 - Inventory system & controls are weak
 - Lack demand forecasting
 - Lack feedback loop between customer support & production teams
 - Vendor selection process needs enhancement
 - Limited quality control platform
 - Lack coordinated production management & timely delivery
- Strategies

Advisory Supply Chain Solutions

Plan 	Procure 	Manufacture 	Fulfill 	Transport 
CFO & Business	<ul style="list-style-type: none"> Procurement Strategy and Process Assessment Organizational Model Assessment and Design Supplier Portfolio Optimization 	<ul style="list-style-type: none"> Standard and Activity Based Costing (ABC) KPI Development and Value Stream Analysis Manufacturing Analytics and Reporting 	<ul style="list-style-type: none"> Warehouse and Inventory Management Process Improvement Logistics and Freight Analysis Cost-to-Serve and Landed Cost Reverse Logistics Process Analysis 	
Compliance	<ul style="list-style-type: none"> Supplier Compliance and Management 	<ul style="list-style-type: none"> Safety and Quality (OSHA, FDA) 	<ul style="list-style-type: none"> Freight and Logistics Contract Monitoring 	
Enterprise Risk & Quantitative	<ul style="list-style-type: none"> Supplier Risk Assessment Input Cost Modeling and Analysis Climate, Energy and Sustainability Modeling 	<ul style="list-style-type: none"> Geographic Manufacturing Risk Manufacturing and Product Cost Modeling BOM Modeling and Analysis 	<ul style="list-style-type: none"> Freight and Delivery Optimization Modeling Fleet Management Modeling and Optimization Data Management and Control 	
Technology	<ul style="list-style-type: none"> Procurement Technology Selection and Implementation Third-Party Technology Security and Assessment 	<ul style="list-style-type: none"> Manufacturing and Distribution Systems Manufacturing and Product Cost Modeling 	<ul style="list-style-type: none"> Warehouse Management System Assistance Point of Sale and Order Management System Integration and Assistance 	
Internal Audit	<ul style="list-style-type: none"> Risk-Based Control Reviews Operational Audit Review and Assistance 	<ul style="list-style-type: none"> Operational Due Diligence Site Visit and Physical Access and Process Review 	<ul style="list-style-type: none"> Branch Warehouse Audit Programs Physical Inventory Quality Programs 	

Questions?

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