COMMODITY VOLATILITY

IMPACTS ON CRE & CONSTRUCTION

JUNE 2021

CUSHMAN & WAKEFIELD

OVERVIEW

Rising commodity prices are stoking fears of inflation that could negatively impact commercial real estate (CRE).

During the pandemic, price increases were largely absorbed by general contractors who were struggling to win the limited number of projects in the market. Now that the economy is reopening, project opportunities are growing and causing contractors to pass the cost increases directly through to clients impacting both occupiers and investors alike.

Commodities critical to real estate construction have seen substantial increases over the past year:

- ***Diesel fuel: +151%***
- ***Lumber: +62%***
- ***Copper: +59%***
- ***Steel: +15%***

Further compounding construction challenges are longer lead times and delays in obtaining materials.

Pricing and supply chain delays are very fluid right now. **Early construction and project management expertise is required to navigate these difficult times** so that investors and occupiers have a thorough plan, sufficient time to manage supply chain issues, and market expertise to execute plan adjustments on the fly.

REASONS FOR COST INCREASES

SUPPLY CHAIN CHALLENGES

Capacity utilization dropped significantly in the first two months of the pandemic due to health concerns, supply chain freezes and/or lack of demand (iron and steel products: -30%; wood product: -15%; metal ore mining: -7%). Capacity utilization did not return to near-pandemic levels until Q2 2021.

STRONG DEMAND

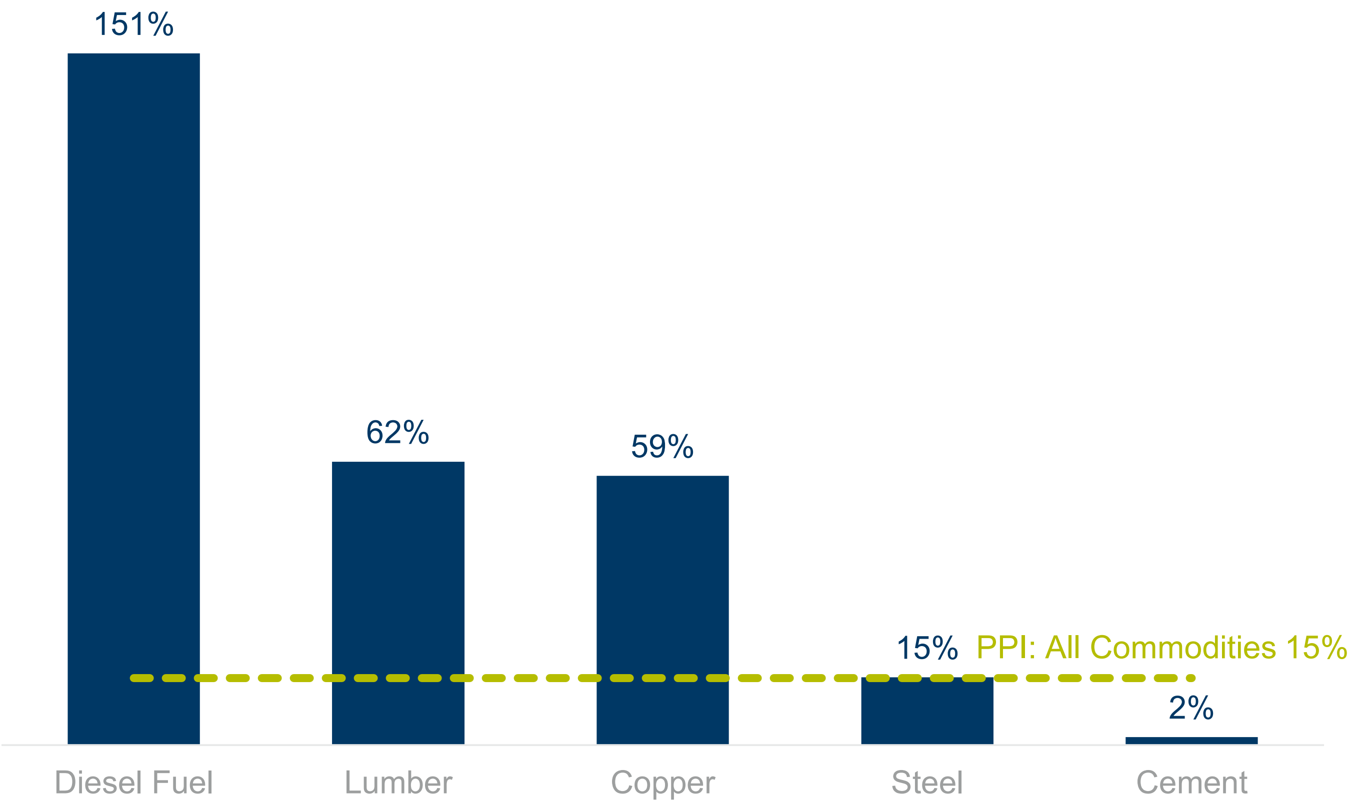
Durable spending is currently ***28% above pre-pandemic*** levels.

EXPECTATIONS FOR FUTURE DEMAND

Construction volume is likely to remain strong. The value of construction put in place is forecast to ***increase by 10% in 2021 and by over 20% in 2022.***

COMMODITIES
WHAT'S GOING ON?

YEAR-OVER-YEAR (YOY) INCREASE, Q2 2021



Source: U.S. Bureau of Labor Statistics (BLS); Moody's Analytics Forecasted; Cushman & Wakefield Research

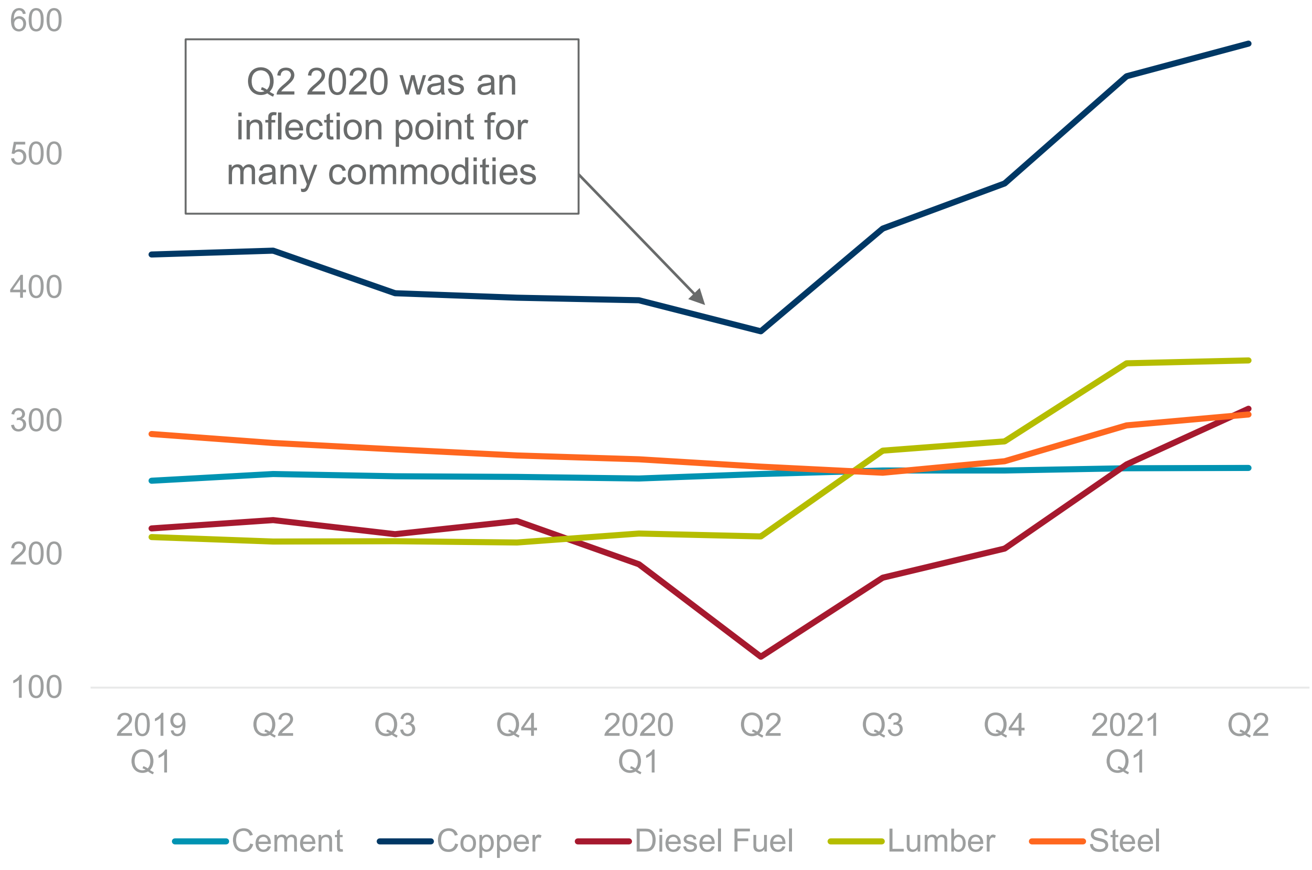
- Commodity prices are skyrocketing as corporate and consumer demand returns and supply struggles to catch up.
  - In Q2 2021, lumber and copper prices are up 60% from a year ago. Diesel fuel prices have more than doubled (+151% YoY).
  - Cement pricing, which is historically not very volatile, has not changed much YoY but is expected to hit growth rates above 4% later this year.
- Consumers are exiting the pandemic with historically high savings and with pent-up demand after a year of limited activity, spurring increased consumer spending.
- Supply is not keeping up as supply chains have been impacted by health concerns, bottlenecks, labor challenges and material shortages.
- Weather events, including drought and deep freeze, wildfires and energy-related hiccups have added to the challenges.

For more thoughts on inflation's impact on commercial real estate, read the recent Cushman & Wakefield report: *U.S. Inflation: Should We Be Worried?*

COMMODITIES

WHY THE PRICE INCREASES?

PRODUCER PRICING INDEX (SINCE Q1 2019)



Source: U.S. Bureau of Labor Statistics (BLS); Moody's Analytics Forecasted; Cushman & Wakefield Research

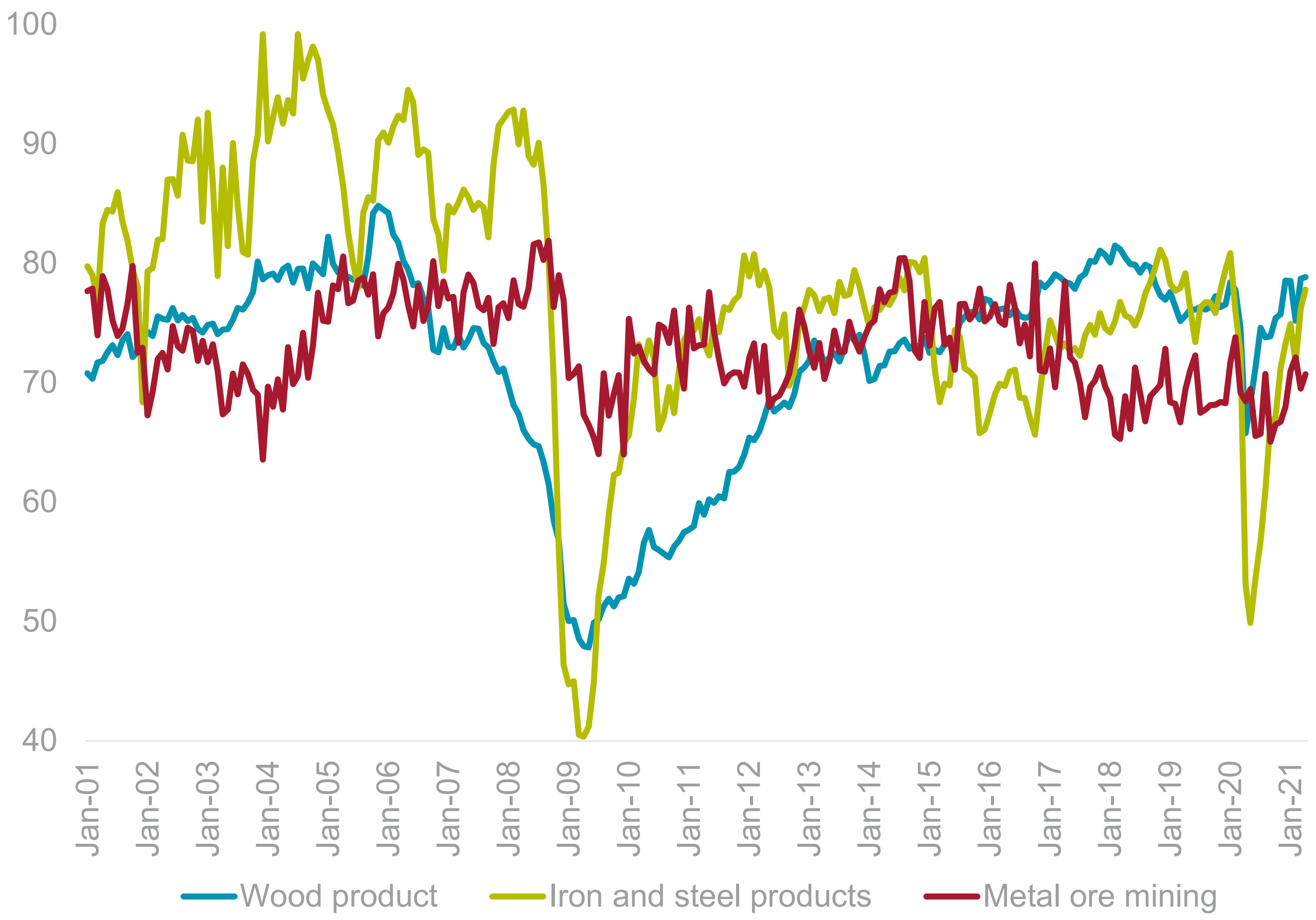
The pandemic created both demand- and supply-side challenges that are still working themselves out.

- Production of many commodities decreased at the onset of the pandemic. While initially caused by drops in demand, production has struggled to reaccelerate due to worker health concerns and supply chain backups which resulted in component material shortages.
- Global liner shipping schedule reliability* declined from nearly 80% to under 40% since mid-2020.
- Construction demand has not slowed, with total private construction ending Q1 2021 up 7.5% YoY and expected to hit 20%+ for the rest of the year. (*See chart on page 5.*)

*Sea-Intelligence Global Liner Performance report.

SUPPLY & DEMAND IMBALANCED

CAPACITY UTILIZATION, SELECT COMMODITIES



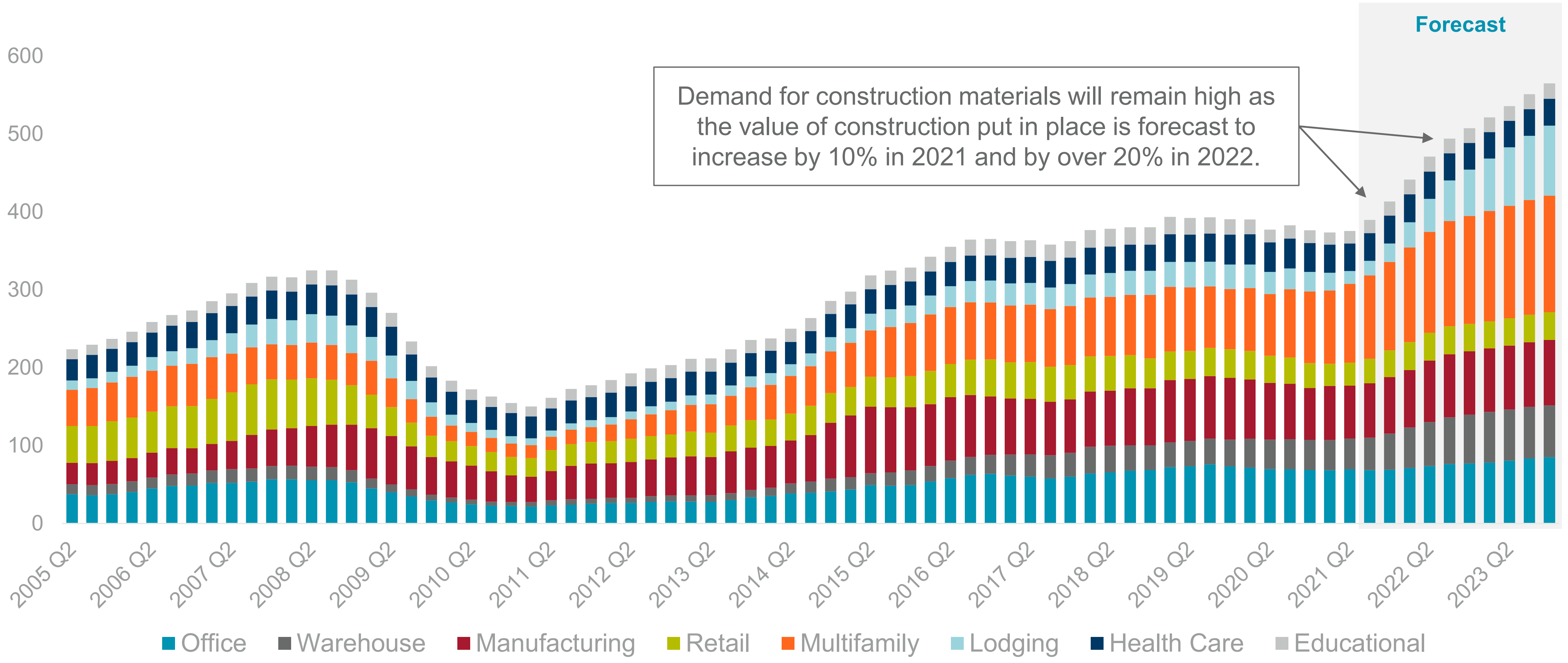
Source: U.S. Board of Governors of the Federal Reserve System

Suppliers are slow to ramp up to pre-pandemic production levels.

- While demand has increased during the pandemic, the supply side has not been able to ramp back up as quickly.
- When the U.S. economy slowed down in March and April of 2020, capacity utilization also dropped significantly. Mills, processing plants and manufacturing operations slowed and/or stopped due to health concerns, supply chain freezes and/or lack of demand. Between February and April 2020, capacity utilization dropped:
  - Iron and steel products: -30.2%
  - Wood product: -15.4%
  - Metal ore mining: -7.2%
- March 2021 was the first month where capacity utilization for all three of these commodities was as high as it had been in February 2020. Capacity remains below prior expansion peak levels and long-term averages.

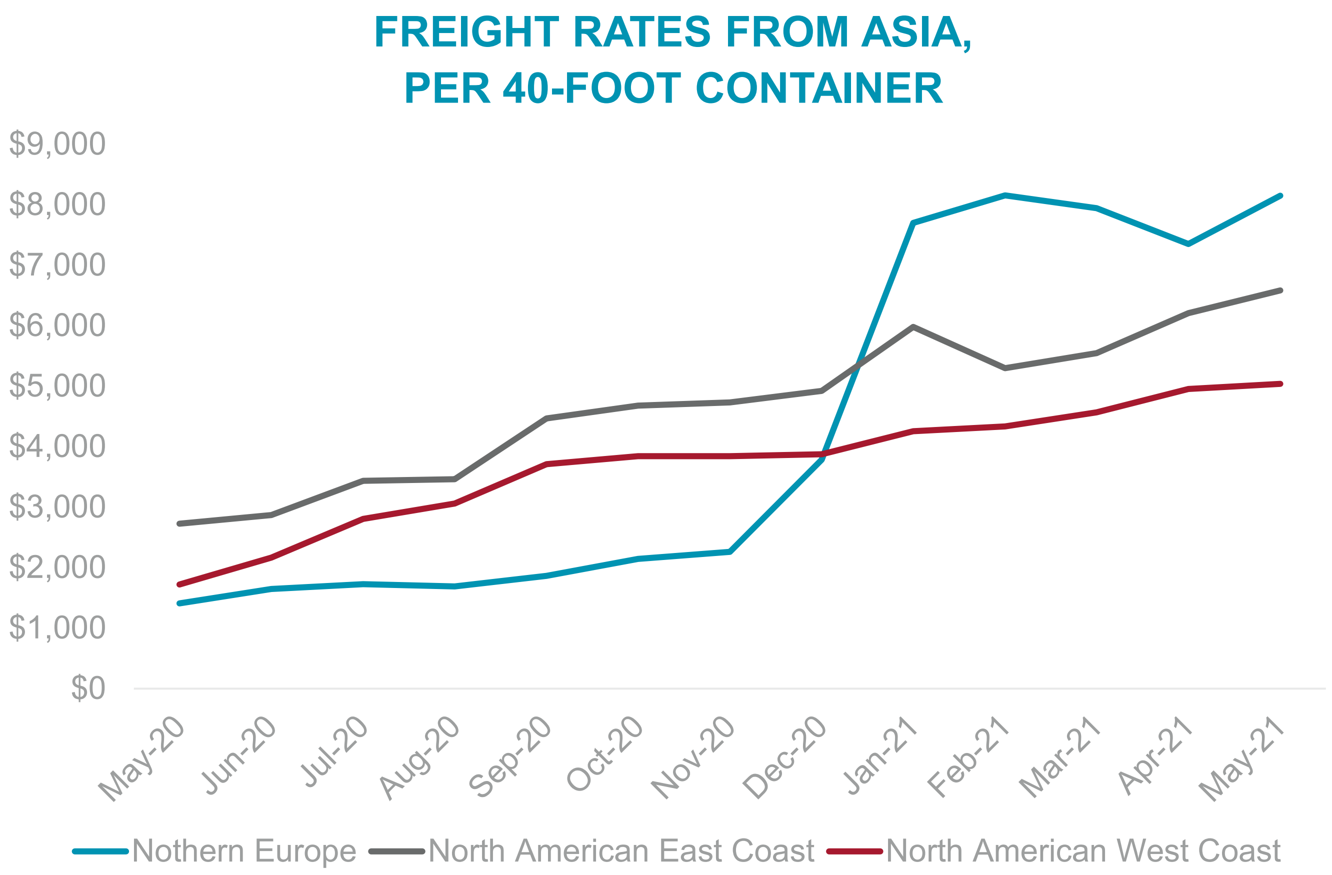
DEMAND ON THE RISE: TOTAL PRIVATE CONSTRUCTION UP 20% YOY IN Q2 2021

VALUE OF CONSTRUCTION PUT IN PLACE: PRIVATE CONSTRUCTION, SELECT CATEGORIES



Source: U.S. Census Bureau (BOC); Moody's Analytics Forecasted; Cushman & Wakefield Research

OVERSEAS SHIPPING RATES MORE THAN TRIPLED IN THE PAST YEAR



Source: Freightos Baltic Index

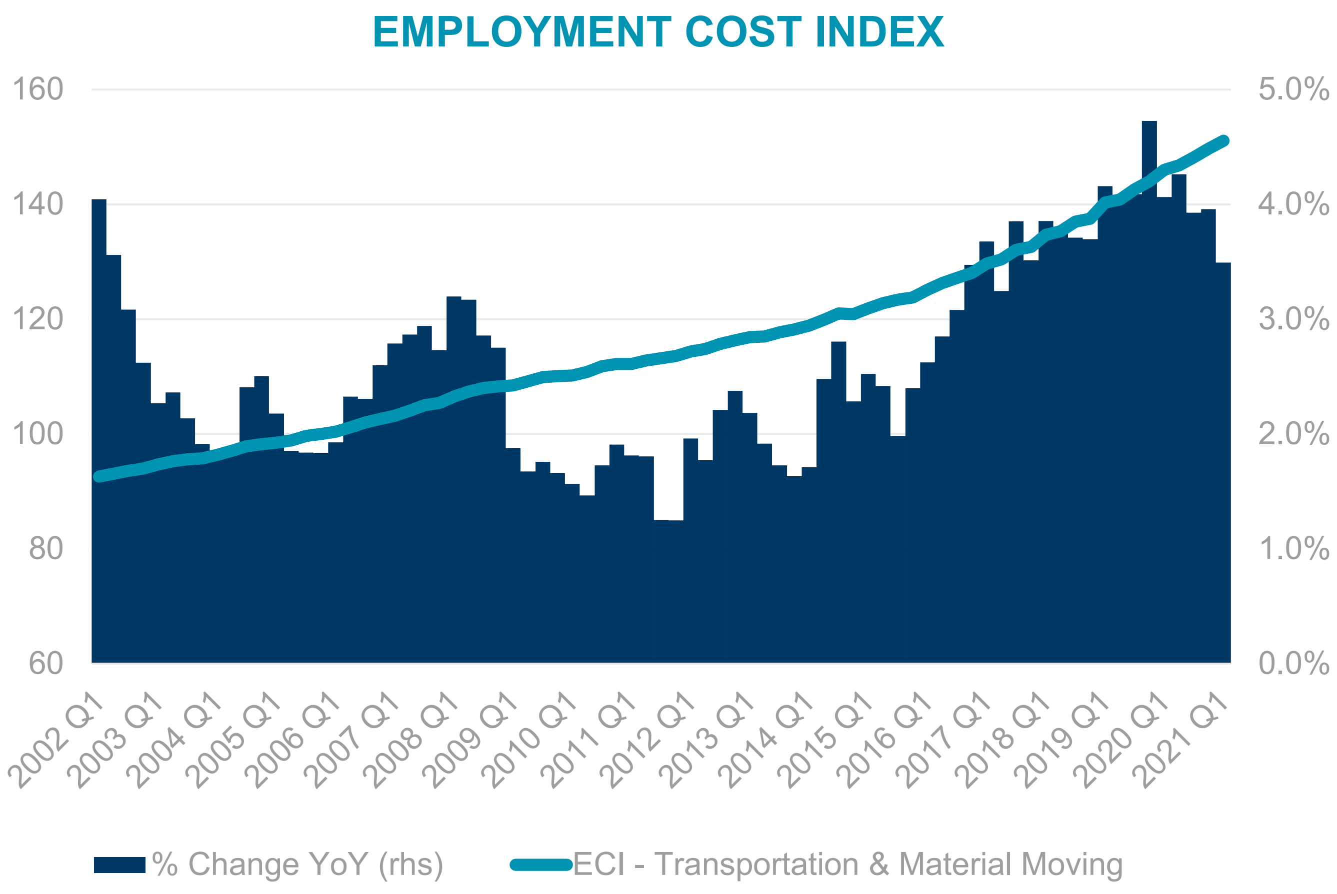
Soaring freight rates for 40-foot containers from Asia are compounding the cost increases for construction.

- Year-over-year, spot rates from Asia to northern Europe jumped from $1,405 to $8,248 and from Asia to the east coast of North America rates went from $2,709 to $6,604.
- Import container volumes at major North American ports declined in the early months of 2020 as Chinese and subsequently other nations' factories closed. However, North American port volumes surged in the second half of 2020 and continued into 2021.
- The whole shipping system slowed down as dwell times increased at each step in the transport network.
- Ocean shipping services struggled to meet demand for imported goods from Asia. Ports then struggled to unload all the ships in a timely manner. The challenge was compounded by pandemic impacts on the port workforce.
- European pricing has been impacted by container shortages in the wake of pandemic-driven disruptions.
- As schedule reliability collapsed, pricing was impacted.

For detailed analysis of North American port activity and its impact on commercial real estate, check out the 2021 North American Ports Outlook.

TRUCKING ALSO BECOMING MORE EXPENSIVE

ECI INCREASED 4.7% YOY IN 2020



Source: U.S. Bureau of Labor Statistics: Employment Cost Index

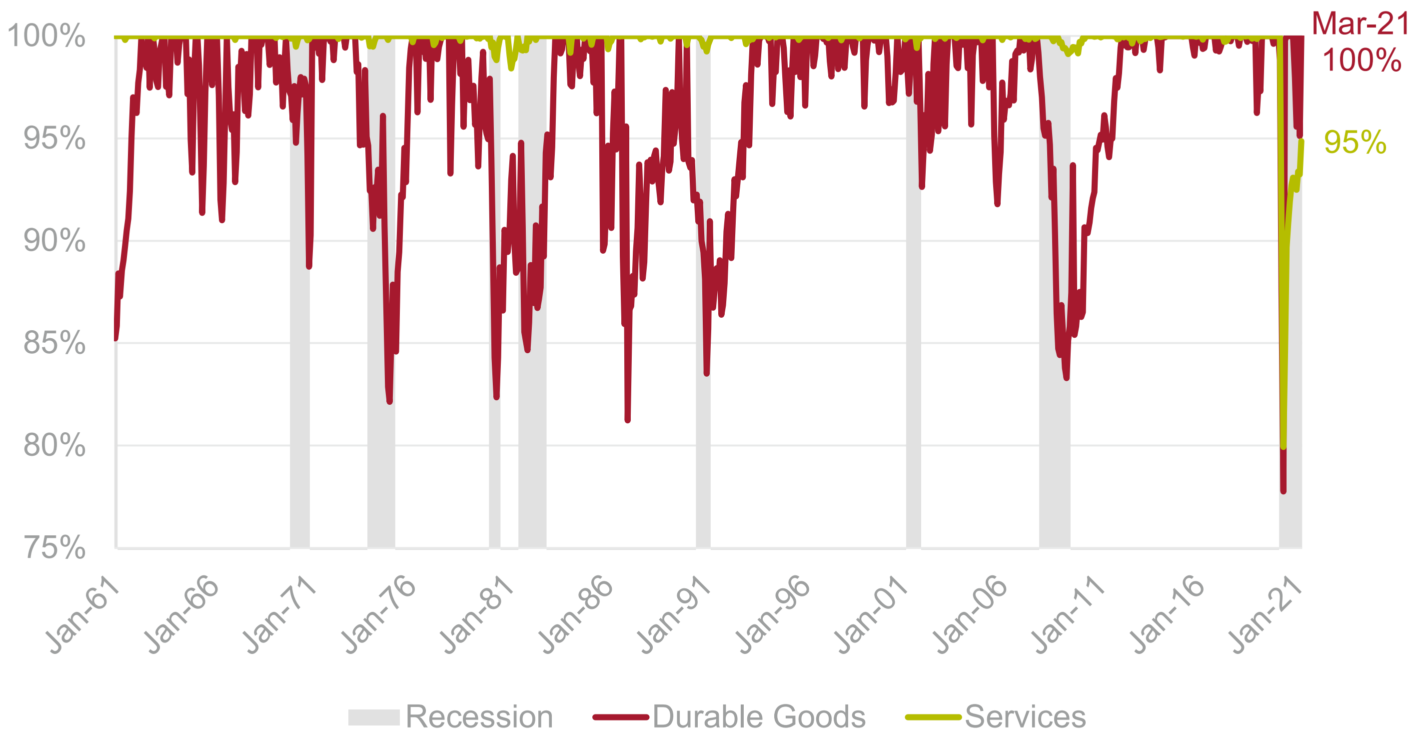
Wages for transportation and material moving workers have been on the rise for years, adding to freight costs.

- Wage increases for transportation and material moving occupations were elevated during the second half of the last decade.
- After increasing 10.3% between Q4 2010 and Q4 2015, the Employment Cost Index (ECI) doubled its growth rate (20.9%) in the five years ending in Q4 2020.
- Transportation labor cost increases in 2020 (4.7%) are significantly higher than the 20-year historical average (2.7% per year).
- Longer-term labor shortages could be a challenge for the industry given its growth trajectory and the demographics of the current workforce. However, its current unemployment rate remains several hundred basis points (bps) above the national average.

CONSUMER PATTERNS SHIFTING

UNLIKE TYPICAL RECESSIONS, DURABLE GOODS SPENDING BOUNCED BACK QUICKLY

REAL SPENDING AS A PERCENTAGE OF THE PRIOR CYCLE'S MAXIMUM



Source: U.S. Bureau of Economic Analysis

The quick recovery of durables spending—items that tend to be commodity-intensive—has meant strong demand for commodities.

- Typically, durable spending falls off during recessions while services spending holds up. This has not been true during the COVID-19 recession.
- Durable spending is 28% above pre-pandemic levels and services spending (which accounts for approximately 60% of all spending) is still down by 5%.
- Homeownership patterns—and home improvement activity fueled by increased time spent at home during the pandemic—have increased consumers' demand for durable goods.
- As the economy reopens, it is widely expected that consumer spending will start to shift back towards services.

According to ENR, 52% of 1,489 AGC member contractors have reported a project delay due to a shortage of construction materials, parts or equipment.

HOW TO MITIGATE CONSTRUCTION RISK IN A VOLATILE MARKET

Commodities do not discriminate by property types (office, industrial, retail or multi-family). Risk reduction/mitigation may be slightly different based on the specific property type, yet these considerations should be evaluated for all project types:

ENGAGE A PROJECT MANAGER EARLY

Given the volatility of the commodities markets, **engage early with a professional project management firm** as soon as possible that will provide the following value-added services:

- Provide **specific advice based on market conditions** for the anticipated type of construction.
- Deliver **valuable industry expertise** with respect to budgeting, scheduling, procurement strategies, suppliers and effective design scope.
- Provide **procurement leverage advantage** with contractors, subcontractors and suppliers based on their buying activity within a market and/or larger geographic area.

PREPARE FOR ALTERNATIVE SOLUTIONS & EXTENDED SCHEDULES

Starting early on the project will allow the Project Team to develop and vet all possible project solutions including developing an accurate customized Master Project Budget and Master Schedule, and conduct value engineering studies.

- Consider **alternatives to traditional in-demand building materials** such as precast concrete panels, PEX plumbing, lumber, CMU, concrete, or steel depending on the material availability, cost and local construction capabilities/techniques.
- Specify **locally produced materials and suppliers** with optimal inventory, location and transportation cost.
- **Pre-purchase materials** such as steel joists for industrial buildings and steel studs for interior tenant improvement buildouts.
- Evaluate the use of **prefabrication and/or modular construction** to expedite the off-site construction, reduce waste and improve field labor productivity.

COMMODITY RISK MITIGATION EXAMPLES *BY PROPERTY TYPE*

OFFICE

- For high-rise office construction, owners should consider a concrete structure in lieu of a steel structure.
- Low- and mid-rise construction may benefit from modular construction to reduce waste and improve labor efficiency.
- Procurement process for interior materials will need to start as early as possible to mitigate supply chain disruptions / delays.

INDUSTRIAL

- Design to maximize bay width to minimize steel joist infrastructure.
- Maximize tilt-up and/or precast construction to reduce structural steel.
- Consider prefabrication wherever possible.
- Start the procurement of steel joists as early as possible to mitigate supply chain disruptions or delays.

RETAIL

- Embrace prefabrication wherever possible. Modularize key building elements—up to the entire structure, if possible—via a centralized hub to minimize transportation costs of raw materials.
- Maximize tilt-up and/or precast construction to reduce structural steel.
- Employ "lean construction" principles, particularly just-in-time delivery, to reduce raw materials stored on site.

MULTIFAMILY

- Low- and mid-rise multifamily may benefit from modular construction.
- Consider alternatives to copper piping, such as PEX plumbing, where permitted by code.
- Consider concrete structure in lieu of a steel structure.
- Fully embrace prefabrication for key building components.
- Source locally produced finishes to minimize transportation costs.

IMPACT ON COMMERCIAL REAL ESTATE MARKET DYNAMICS

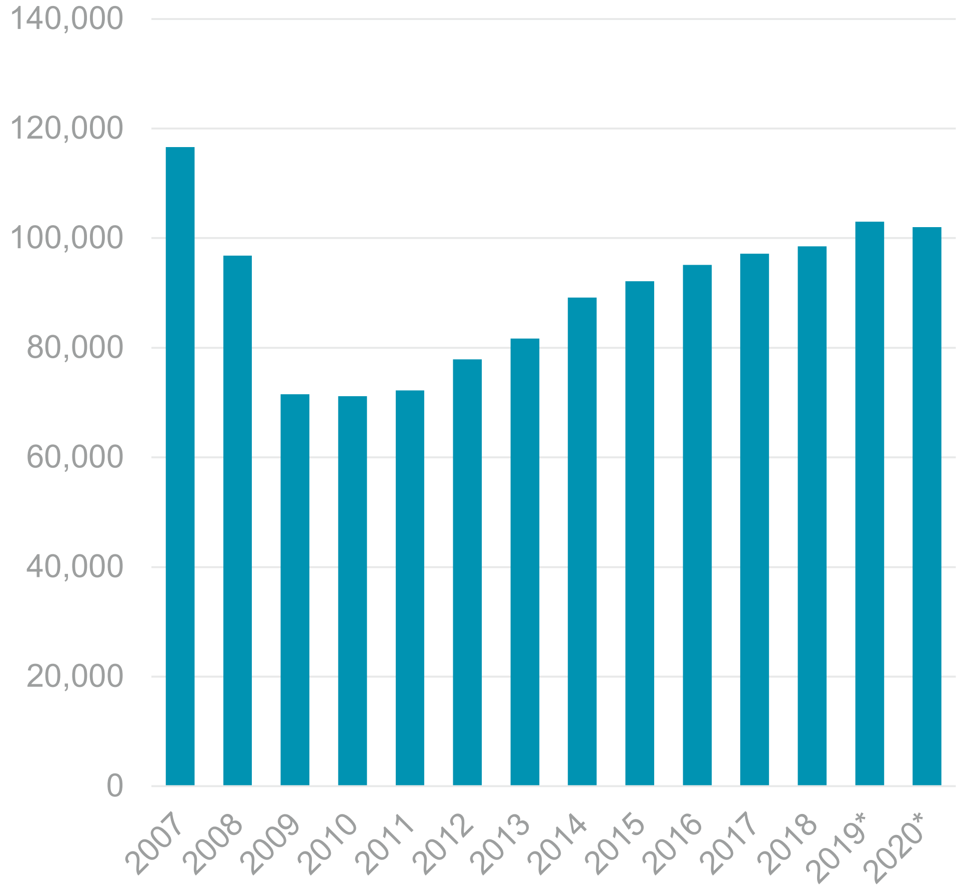
- Increased material costs drive replacement costs higher, which supports the value of existing assets.
- The faster rents are growing now, the greater the margin of safety developers have to absorb the cost of higher materials prices and supply chain uncertainty.
- From the occupier developer / build-to-suit perspective, the question is how confident one can be that functional space can be secured in the right locations in order to meet projected needs. The greater level of product specificity will tend to mean greater ability to absorb development cost increases because existing assets are less substitutable.
- Supply-demand imbalances will likely keep cost growth rates high, but improvements in supply chains should moderate increases.

APPENDIX

CEMENT

U.S. CONSUMPTION REMAINED CONSISTENT; GLOBAL PRODUCTION DECLINED BY 2.5%

U.S. Apparent Cement Consumption (1,000 Metric Tons)



#	Market	2019 Production (million metric tons)	2020 Production* (million metric tons)
1	China	2,300	2,200
2	India	340	340
3	Vietnam	97	96
4	United States	89	90
5	Indonesia	70	73
6	Turkey	57	66
7	Iran	60	60
8	Brazil	54	57
9	Russia	56	56
10	Japan	53	53
11	Egypt	47	50
12	South Korea	50	50
	Top 12 Markets	**3,273**	**3,191**

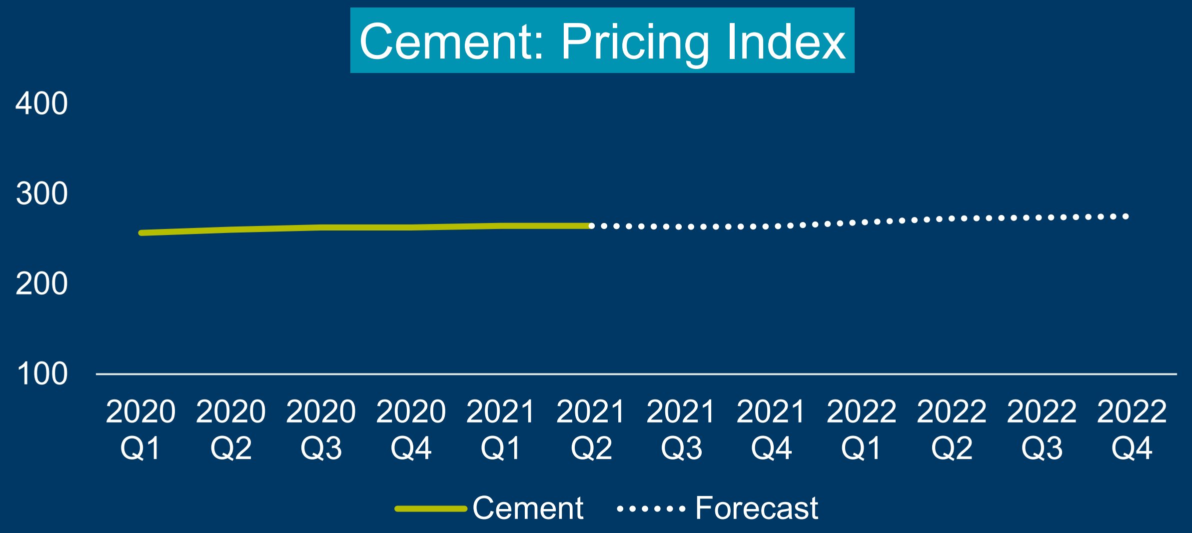
Source: U.S. Geological Survey; Statista

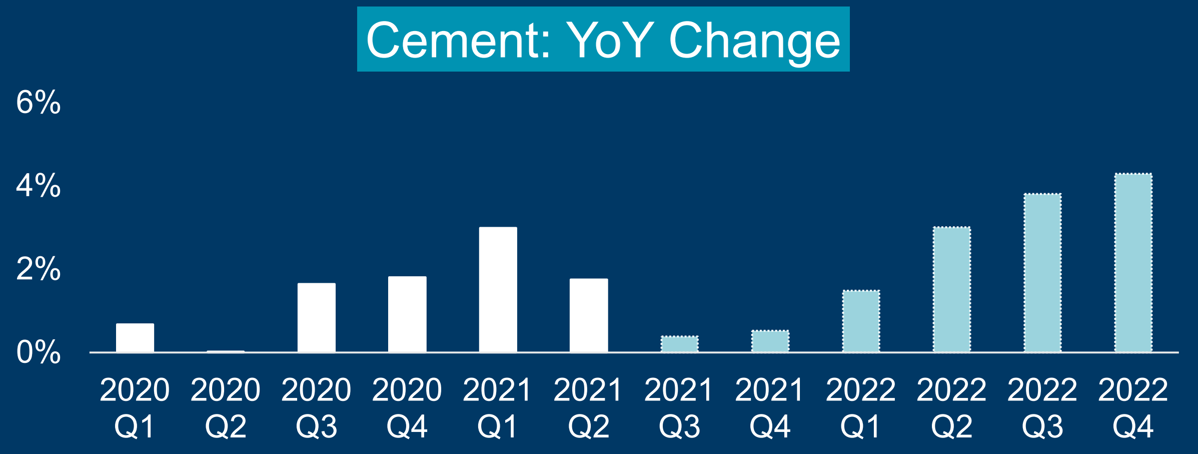
Estimate

CEMENT

PRICES FORECAST TO GROW BY 4% NEXT YEAR

- Relative to other commodities, cement pricing is more stable. YoY growth hasn't exceeded 5% since 2017, and it only went above 8% one time in the past decade (i.e., Q1 2015).
  - By way of comparison, it is not uncommon for other commodities to have double-digit YoY changes in pricing. Since 2010, # of times commodities have YoY change of +/- 10%:
    - Diesel fuel: 31 times
    - Steel: 19
    - Copper: 29
    - Lumber: 14
- The annualized growth rate during the last expansion (between Q1 2010 and Q1 2020) was 2.6%. The forecast is for 0.5% YoY growth for Q4 2021, followed by 4.3% YoY growth in Q4 2022.



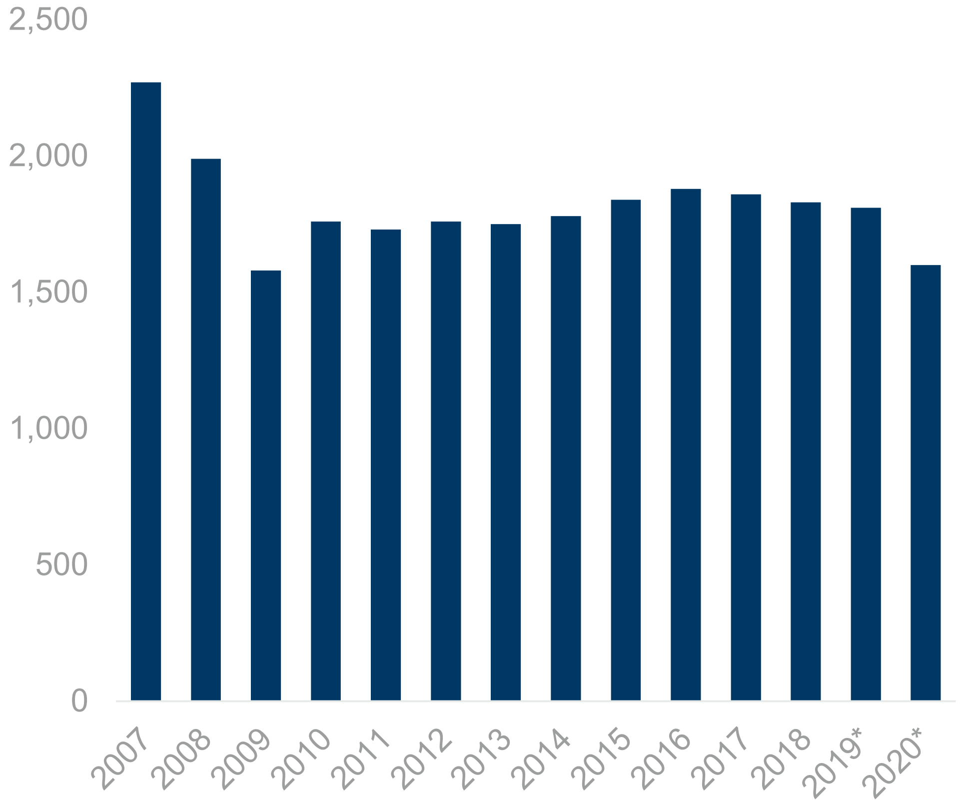


Source: U.S. Bureau of Labor Statistics (BLS); Moody's Analytics Forecasted; Cushman & Wakefield Research

COPPER

IN 2020, U.S. CONSUMPTION WAS AT LOWEST POINT IN A DECADE, DOWN 11.6% YOY

U.S. Copper Consumption (1,000 Metric Tons)



#	Market	2019 Production (1,000s metric tons)	2020 Production (1,000s metric tons)
1	Chile	5,790	5,700
2	Peru	2,460	2,200
3	China	1,680	1,700
4	DR Congo	1,290	1,300
5	United States	1,260	1,200
6	Australia	934	870
7	Russia	801	850
8	Zambia	797	830
9	Mexico	715	690
10	Kazakhstan	562	580
11	Canada	573	570
12	Poland	399	400
	Top 12 Markets	**17,261**	**16,890**

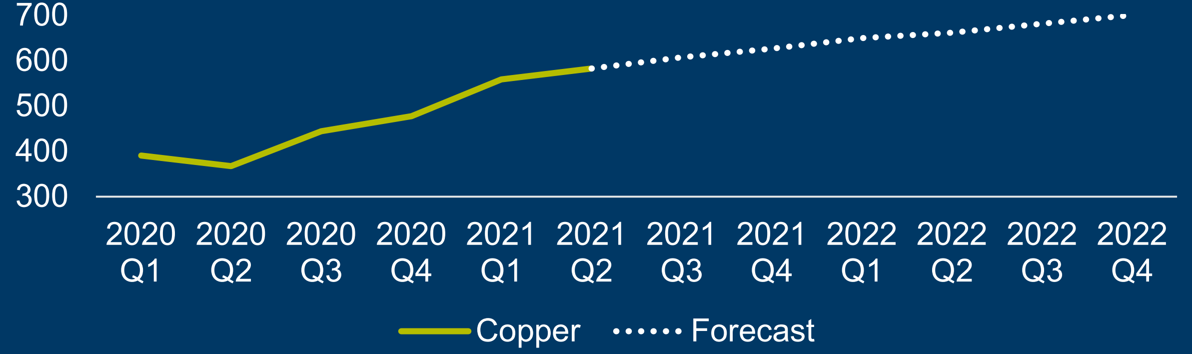
Source: U.S. Geological Survey; Statista
**Estimate*

COPPER

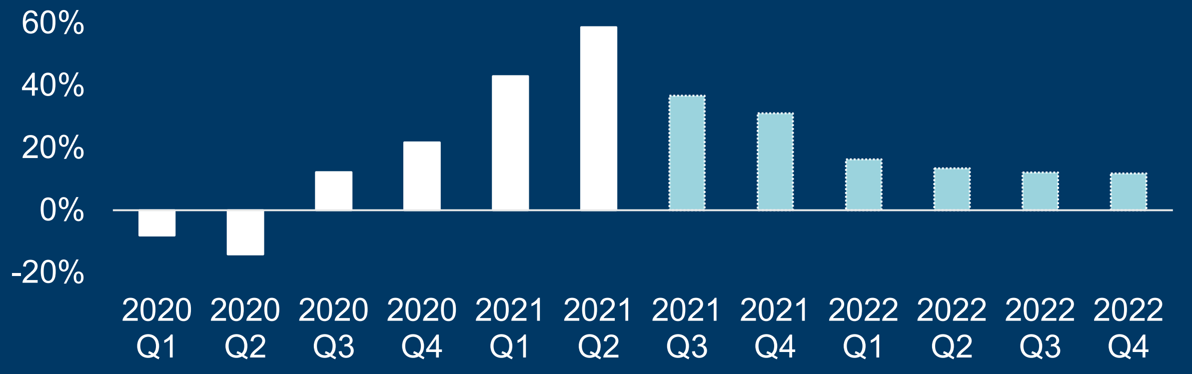
PRICE GROWTH FORECASTED FOR THE NEXT DECADE

- Coming into the pandemic, the price index of copper was experiencing a steady decline, hitting its trough in Q2 2020 25% below its mid-2018 peak.
- Over the next three quarters, copper prices increased by 50%, and they are on track to increase by 60% YoY in Q2 2021.
- There is no end in sight for copper price increases, with the index expected to grow another 22% over the next two years.
- Copper has been referred to as the *new oil** as it plays an important role in semiconductor wiring, electric vehicle batteries and other green economy technologies, which are likely to be growth sectors and take significant market share over the next decade.

Copper: Pricing Index



Copper: YoY Change

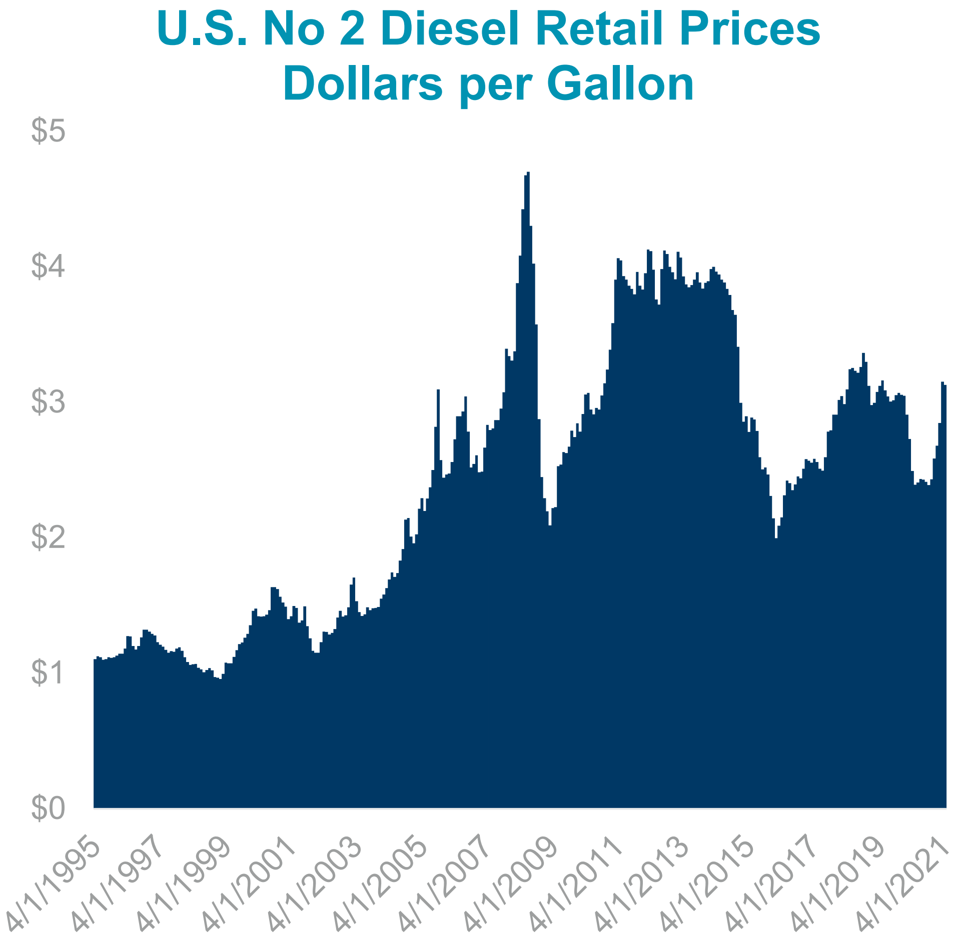


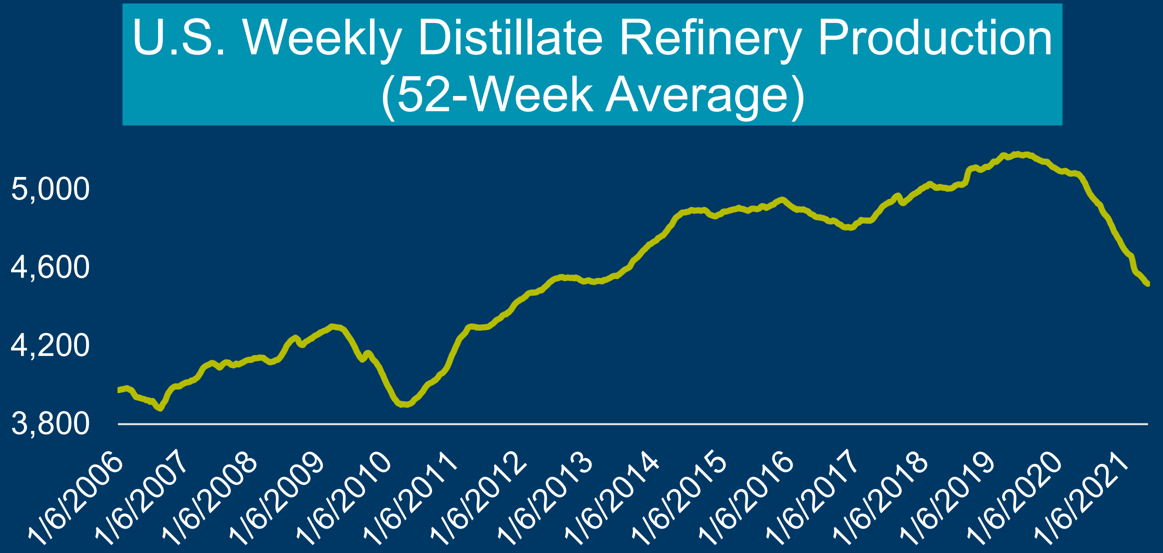
Source: U.S. Bureau of Labor Statistics (BLS); Moody's Analytics Forecasted; Cushman & Wakefield Research

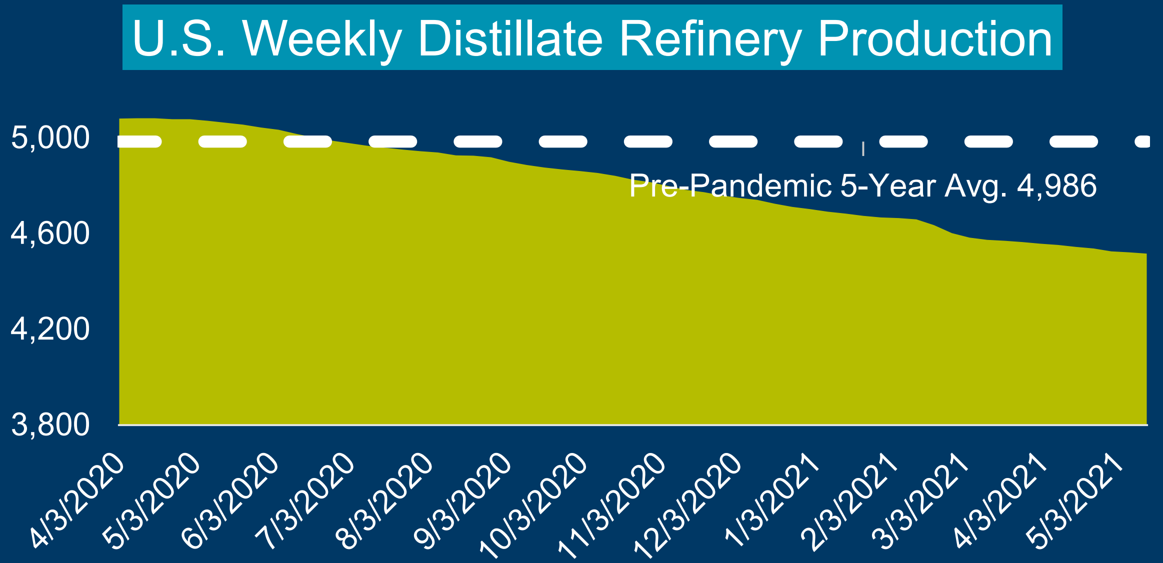
*David Neuhauser, founder and managing director of U.S. hedge fund Livermore Partners, as quoted by CNBC, “Copper is ‘the new oil’ and low inventories could push it to $20,000 per ton, analysts say”

DIESEL FUEL

DOMESTIC REFINERY PRODUCTION IS 13% OFF JUNE 2019 PEAK







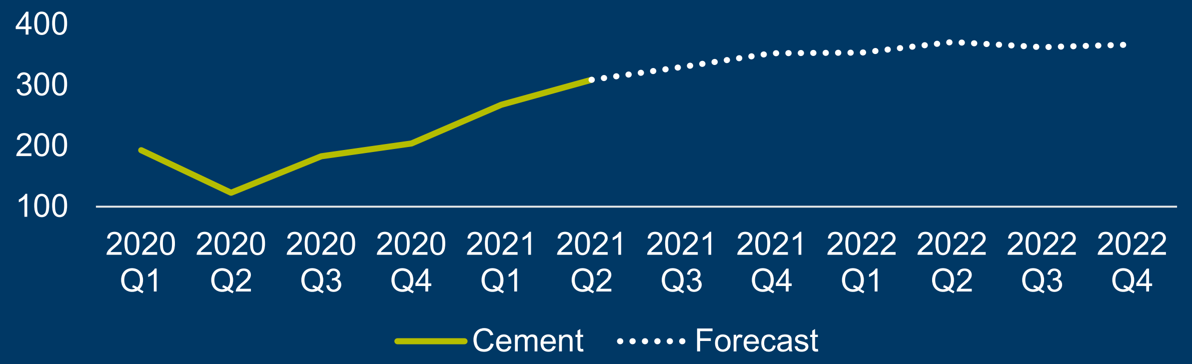
Source: U.S. Energy Information Administration (EIA)

DIESEL FUEL

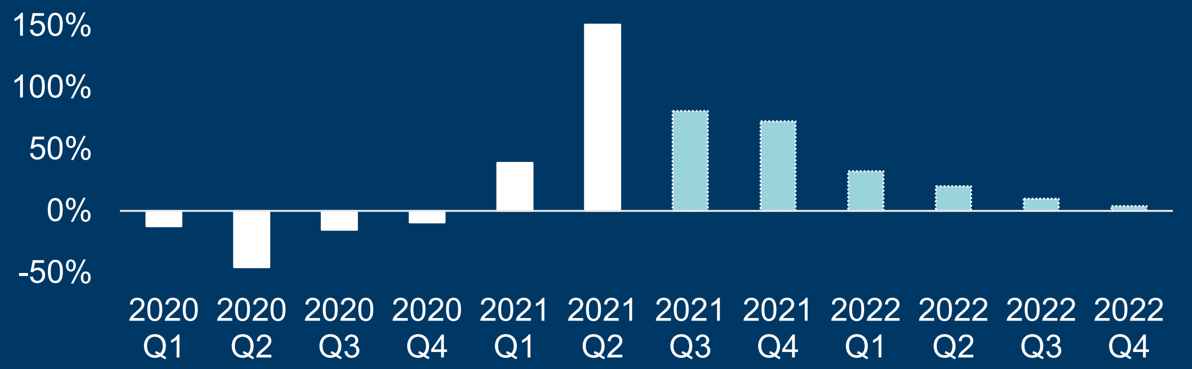
AFTER SHARP DECLINES AT THE BEGINNING OF PANDEMIC, PRICES SKYROCKET

- Diesel fuel pricing doubled over the first four quarters of the pandemic. It is worth noting this is off a lower-than average base, however, as diesel prices had declined 25% between late 2018 and Q1 2020.
- While prices have accelerated, they are not at all-time highs. The producer price index is forecasted to keep increasing into the middle of next year. And, if prices stay on that trajectory, Q2 2022 would be the third highest quarter on record (behind only Q2 & Q3 2008).
- As the global economy heats up, fuel demand should remain strong. Catching up on supply chain bottlenecks and elevated e-commerce activity will require growth in shipping and transportation.

Diesel Fuel: Pricing Index



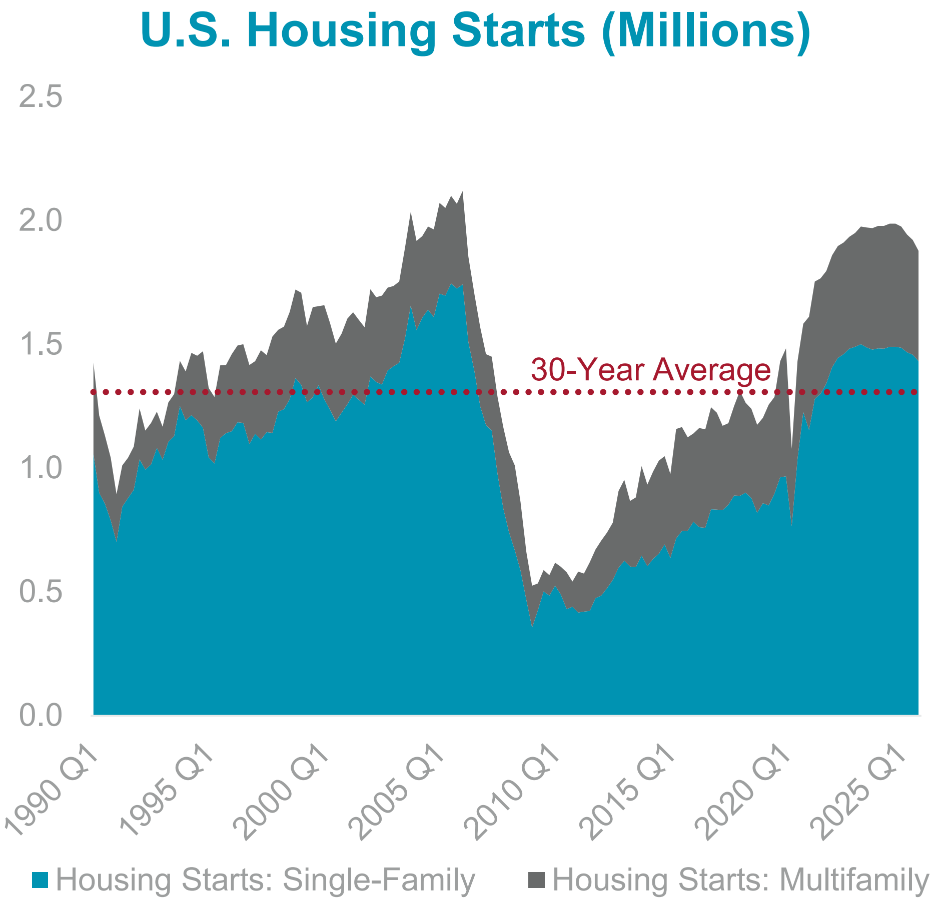
Diesel Fuel: YoY Change



Source: U.S. Bureau of Labor Statistics (BLS); Moody's Analytics Forecasted; Cushman & Wakefield Research

LUMBER

CONSTRUCTION DEMAND FORECAST TO REMAIN AT ELEVATED LEVELS FOR YEARS



#	Market	2019 Lumber Production (million cubic meters)
1	United States	284
2	China	273
3	Russia	273
4	Canada	194
5	Brazil	72
6	Germany	71
7	India	66
8	Sweden	56
9	Indonesia	40
10	New Zealand	37
11	Finland	36
12	Chile	32
	Top 12 Markets	**1,334**

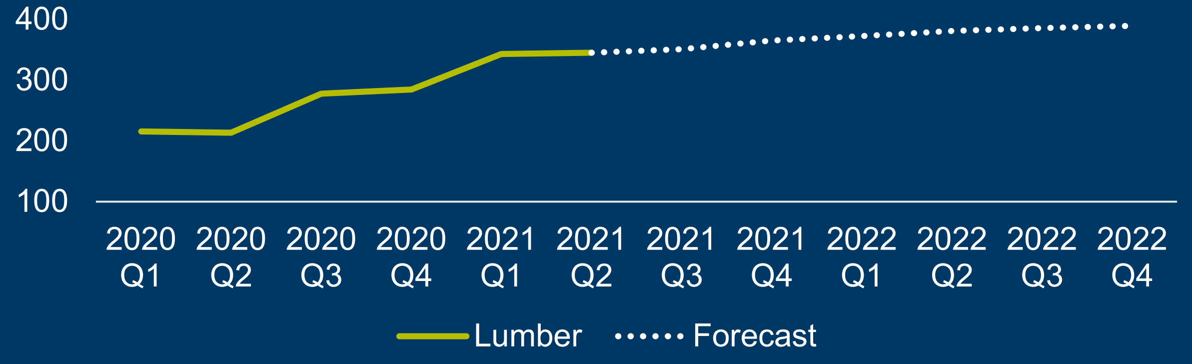
Source: Food and Agricultural Organization of the United Nations; U.S. Census Bureau (BOC); Moody's Analytics Forecasted

LUMBER

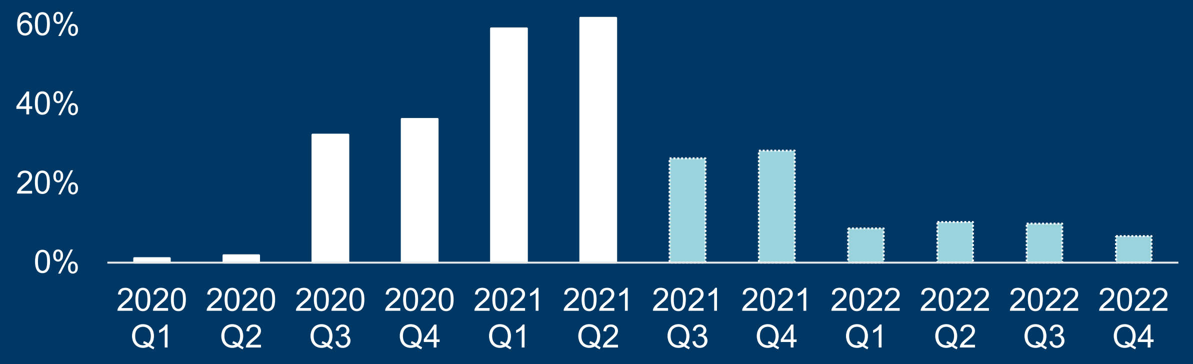
PRICING FORECAST TO GROW BY DOUBLE DIGITS YOY THROUGH THE END OF 2021

- Demand for lumber has been strong as single-family and multifamily construction starts increased during the pandemic and renovation projects for people spending the bulk of their time at home were popular.
- Mill capacity has not been increasing fast enough to keep up with the (surprising) spike in demand during the pandemic. Lumber producers are now increasing capacity at existing mills.*
- Lumber supply in the U.S. was impacted by increased tariffs on Canadian lumber in 2017. Many of those tariffs have been rolled back recently, but it will take time to increase supply.
- Growth in lumber producer prices is expected to reach 28% in 2021 and 7% in 2022 before leveling out closer to 2% in the middle of the decade.

Lumber: Pricing Index



Lumber: YoY Change

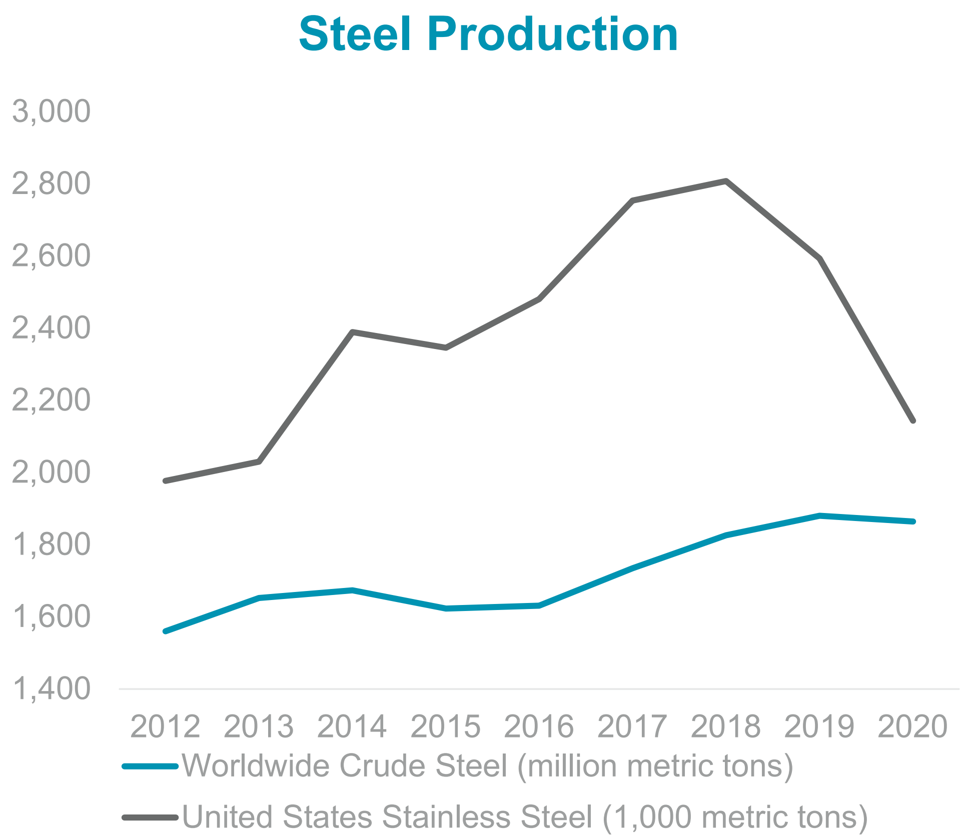


Source: U.S. Bureau of Labor Statistics (BLS); Moody's Analytics Forecasted; Cushman & Wakefield Research

*Bloomberg, “Canadian Lumber Producers to Expand U.S. Mills Amid Home Boom”

STEEL

2020 U.S. STAINLESS STEEL PRODUCTION AT LOWEST POINT IN SEVEN YEARS



#	Market	2019 Production (1,000s metric tons)
1	EU-28	21,793
2	United States	17,685
3	Japan	7,657
4	Canada	4,369
5	Russia	4,059
6	Australia	2,325
7	Hong Kong	958
8	Singapore	759
	Top 8 Markets	**59,605**

Source: Wirtschaftsvereinigung Stahl; Bureau of International Recycling; Various sources; Statista

STEEL

AFTER TWO YEARS OF DECLINES, PANDEMIC-INDUCED SHORTAGES SPIKED PRICES

- Steel producer pricing has been up-and-down over the past few years. U.S. tariffs led to a double-digit increase in 2018. Then, the producer pricing index declined for eight straight quarters until its trough in Q3 2020.
- The next three quarters registered strong price growth as the index ended Q1 2021 in line with the 2018 peak.
- Mills shutdowns at the beginning of the pandemic and were slow to resume operations, which led to steel shortages, which have driven price gains. These are expected to continue through this year and decelerate in 2022.

Source: U.S. Bureau of Labor Statistics (BLS); Moody's Analytics Forecasted; Cushman & Wakefield Research

AUTHORS:

BRIAN UNGLES
Project & Development Services,
Americas Leader
brian.ungles@cushwake.com

DAVID C. SMITH
Vice President
Global Head of Occupier Insights
david.smith4@cushwake.com

REBECCA ROCKEY
Economist
Global Head of Economic Analysis & Forecasting
rebecca.rockey@cushwake.com

DAVID BITNER
Vice President
Global Head of Capital Markets Insights
david.bitner@cushwake.com

REGIONAL PROJECT & DEVELOPMENT SERVICES LEADS:

BRIAN JAFFE
Executive Managing Director
Western Region Lead,
Project & Development Services
brian.jaffe@cushwake.com

RICHARD JANTZ
Executive Managing Director
Tri-State Region Lead,
Project & Development Services
richard.jantz@cushwake.com

TOM FIORETTI
Executive Managing Director
Central Region Lead,
Project & Development Services
tom.fioretti@cushwake.com

GARY HELMINSKI
Executive Managing Director
Northeast & Mid-Atlantic Region Lead,
Project & Development Services
gary.helminski@cushwake.com

TYLER PAYTAS
PDS GOS Platform & Solutions Lead, Americas
Global Occupier Services
tyler.paytas@cushwake.com