Material Price Escalation, Supply-Chain Issues, Covid-19, and Russian Invasion
01/02/24

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This HDR course is awarded Professional Development Hour(s) PDH(s).

Attend entire session

Active participation

LEARNING OBJECTIVES

- Upon completion of this webinar, you will be able to retain information on the current material price impacts.
- Upon completion of this webinar, you will be able to retain information on the supply-chain issues.
- Upon completion of this webinar, you will be able to identify the impacts of the Russian invasion of Ukraine.
- Upon completion of this webinar, you will be able to identify what is included in the market volatility adjustment factor, currently being added to OPCC.

AGENDA

1 Inflation Impacts

2 Material Impacts

3 Price Volatility

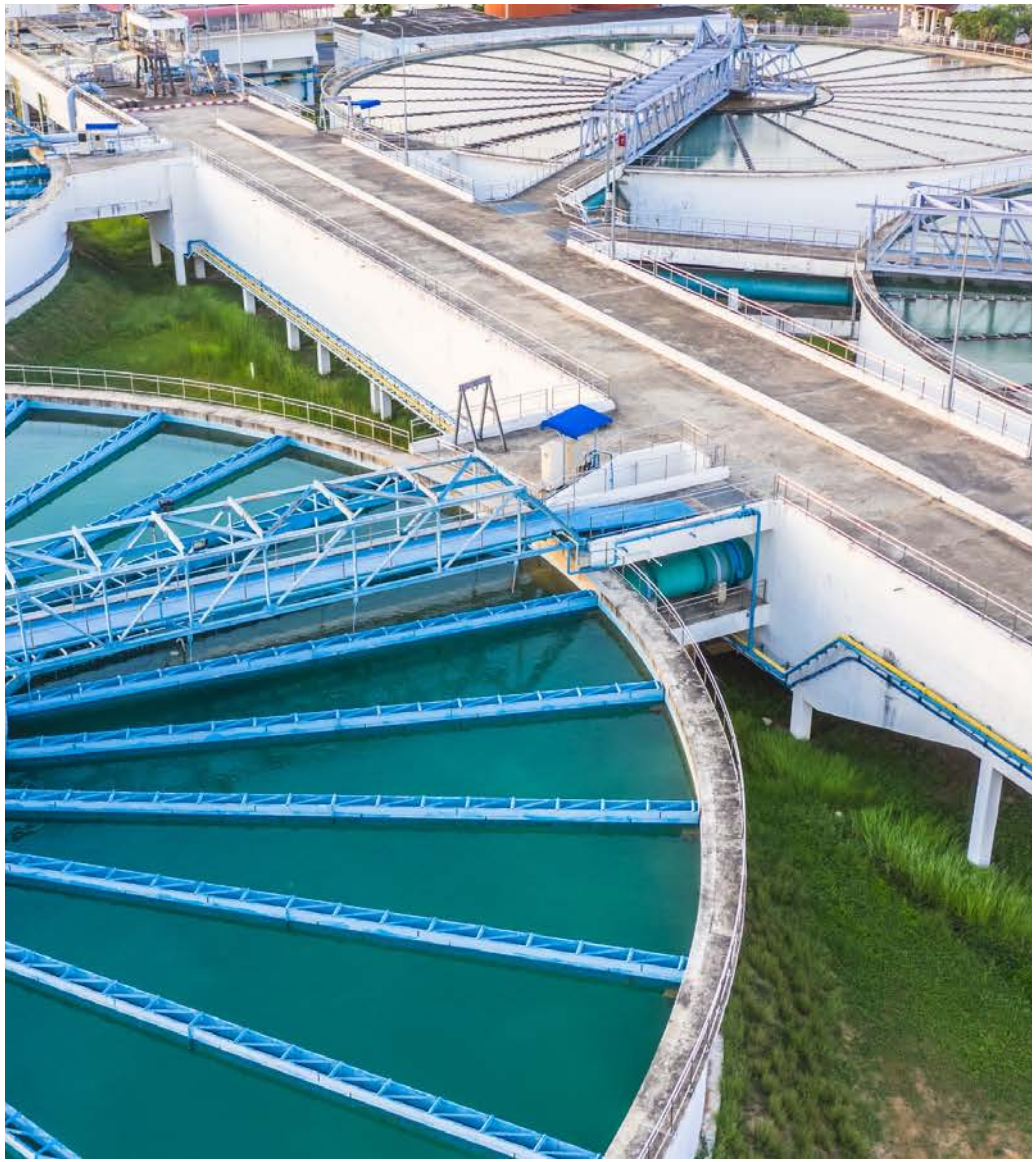
4 Bidding Environment

5 Russian Invasion of Ukraine

6 Market Volatility Adjustment Factor

7 Buy American Act

8 Suggestions and Action

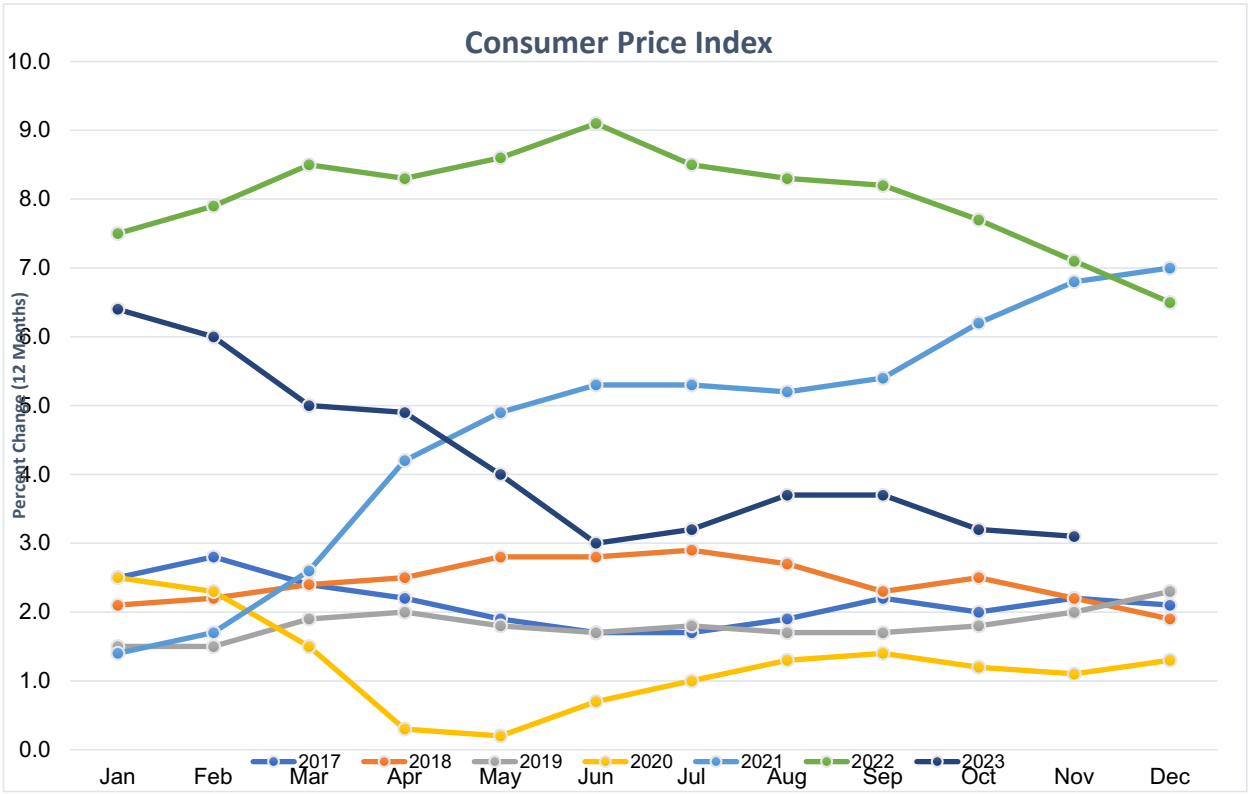


Inflation Impacts (CPI) Y/Y

Consumer Price Index	+3.1%
Food	**+2.9%**
Meats, Poultry, Fish, and Eggs	+0.1%
Energy	**-5.4%**
Gasoline	-8.9%
Electricity	+3.4%
Natural Gas	-10.4%
Other Commodities	**+0.0%**
Apparel	+1.1%
New Vehicles	+1.3%
Used Cars and Trucks	-3.8%
Motor Vehicle Maint/Repair	+8.5%
Airline Fares	-12.1%

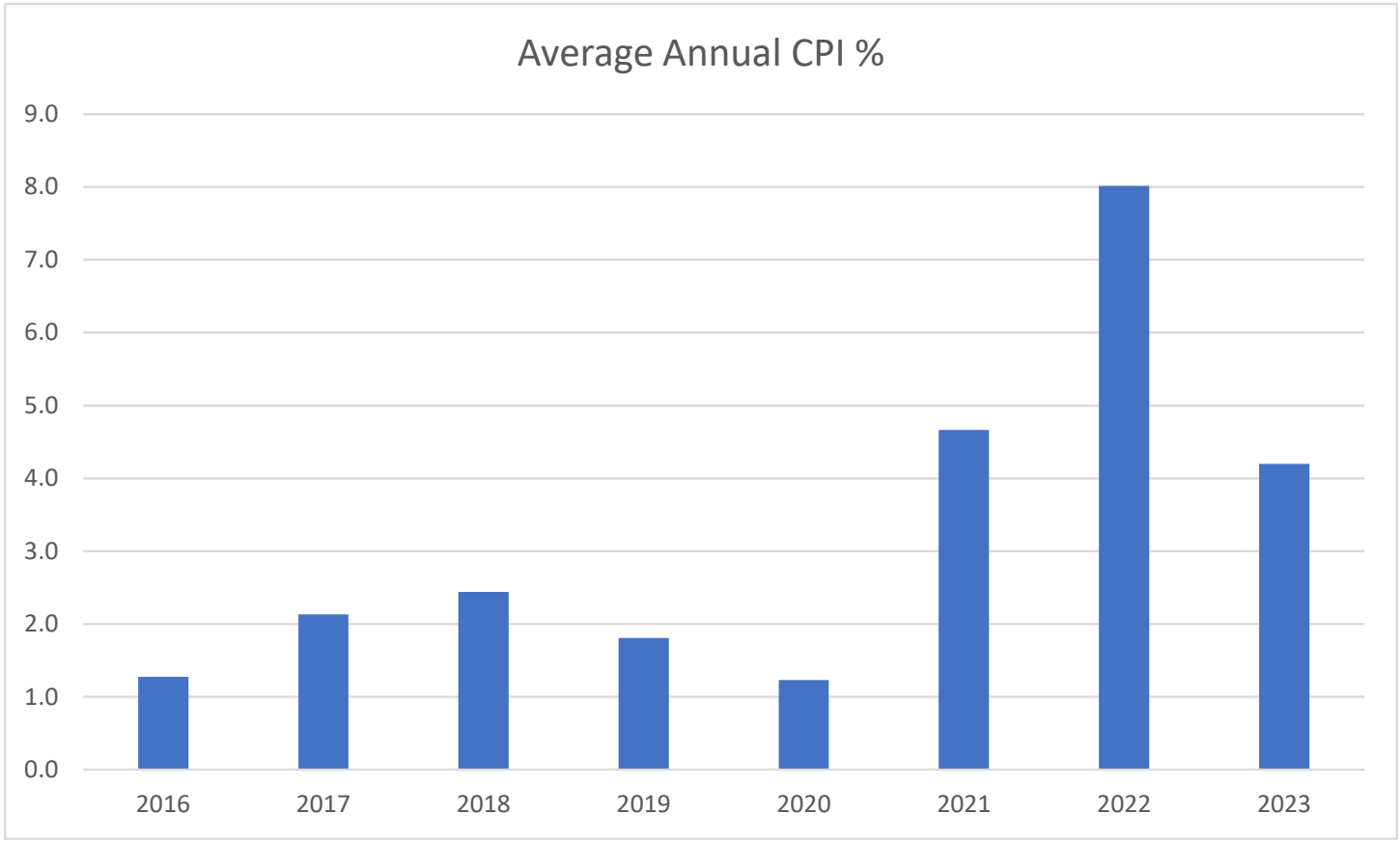
U.S. Bureau of Labor Statistics

Consumer Price Index



- Northeast +2.5%
- Midwest +2.9%
- South +3.4%
- West +3.3%
- Atlanta, GA +3.2%

U.S. Bureau of Labor Statistics



U.S. Bureau of Labor Statistics

Material Impacts

Change in construction materials and labor costs vs. CPI

cumulative % change, Feb. 2020–Sep. 2023, in PPI for construction inputs, AHE for nonsupervisory construction employees, & CPI

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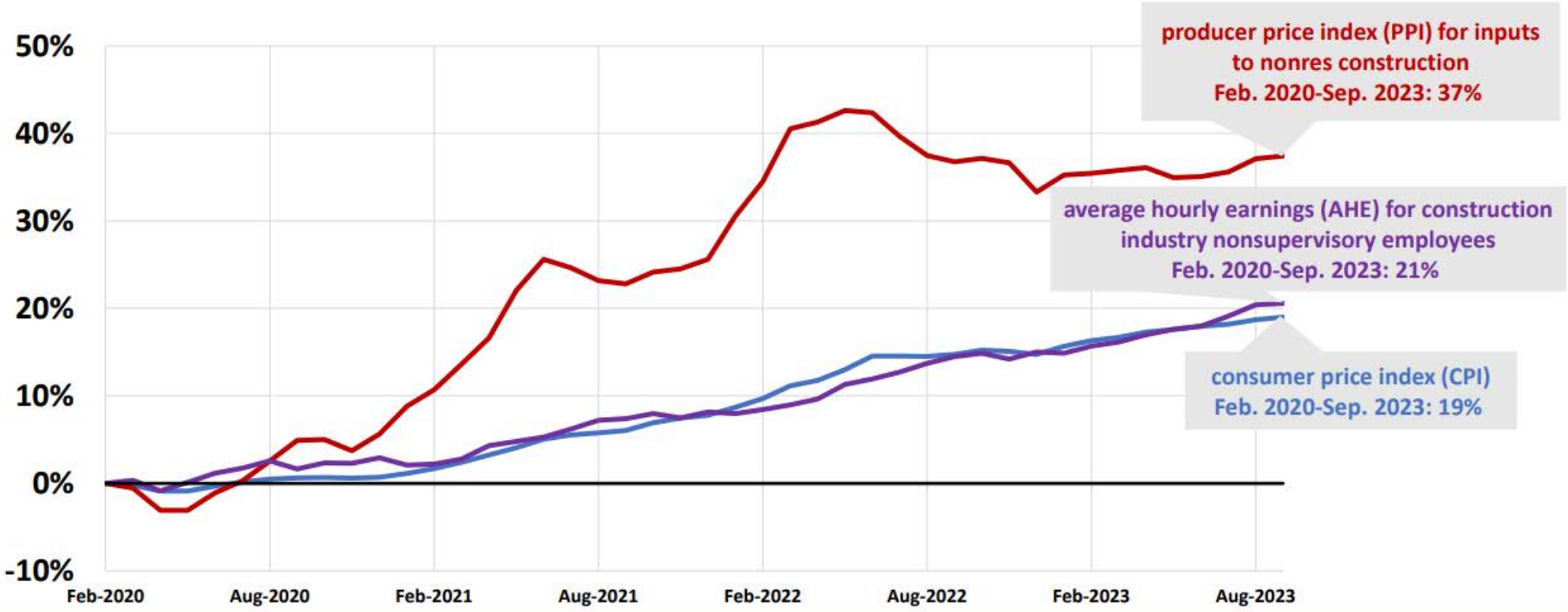

 Source: Bureau of Labor Statistics, consumer price index, producer price index, average hourly earnings

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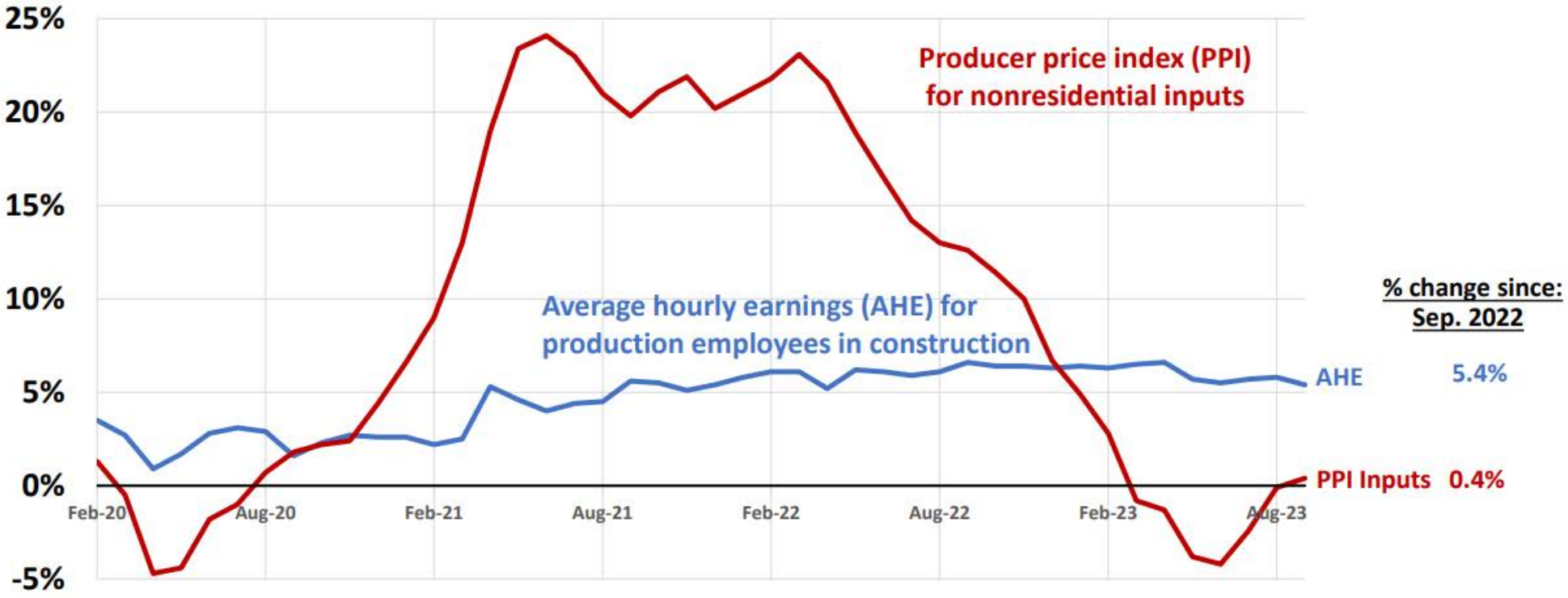
Construction inputs & labor costs

Year-over-year change in PPI for nonresidential inputs & AHE for production employees in construction, Feb. 2020 – Sep. 2023



 Source: Bureau of Labor Statistics, PPI, www.bls.gov/ppi ; Current Employment Statistics, AHE, https://www.bls.gov/ces/

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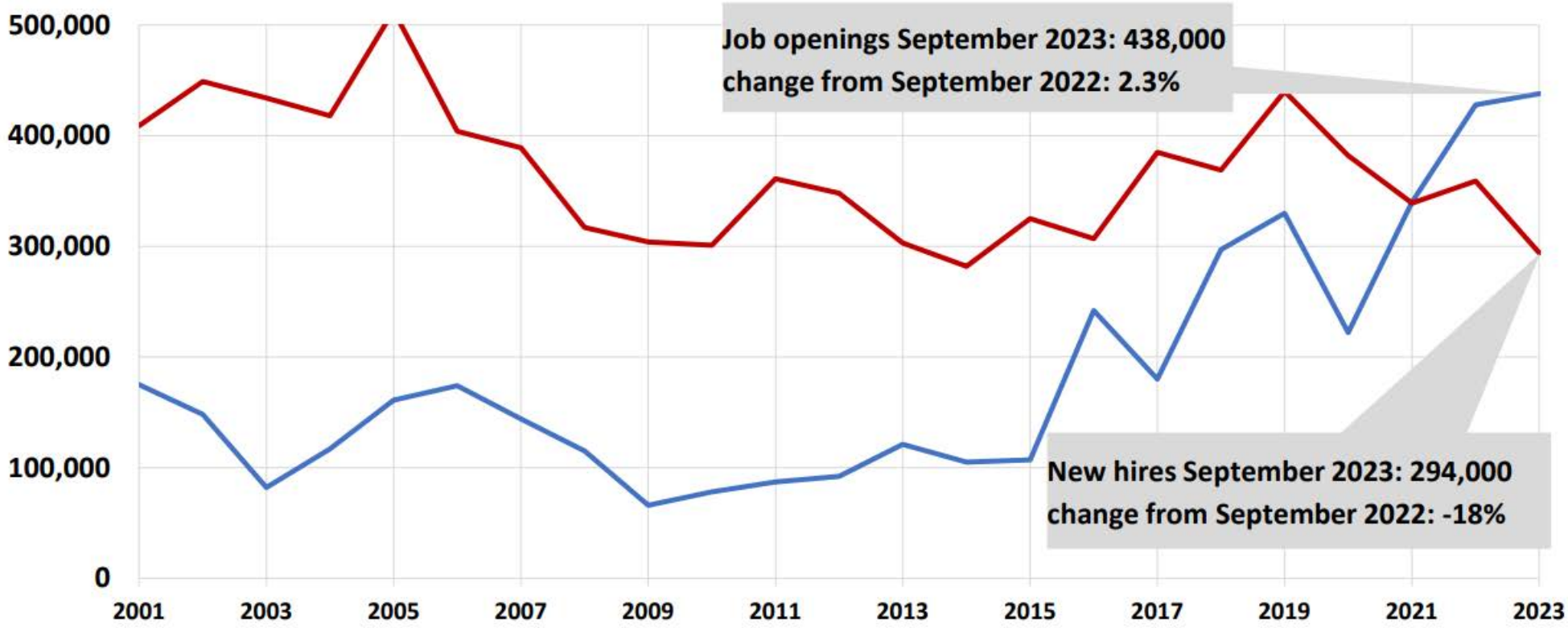
Construction job openings & new hires

Job openings and hires, September 2001-September 2023, not seasonally adjusted



 Source: Bureau of Labor Statistics, www.bls.gov/jlt, Job Openings & Labor Turnover Survey (JOLTS)

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Some construction costs remain volatile

producer price indexes, 1- & 12-mo. change (not seasonally adjusted)

	September 2023 change from: Aug. 2023 (1 month)	Sep. 2022 (12 months)
Cement	0.7%	10.8%
Ready-mix concrete	0.1%	9.8%
Diesel fuel	4.3%	-18.6%
Subcontractor price indexes, nonresidential building work		
Roofing contractors	-0.5%	10.8%
Plumbing contractors	0.0%	7.1%
Electrical contractors	0.1%	4.1%
Concrete contractors	0.0%	-2.1%

Change in construction spending: September 2023 vs. September 2022

current (not inflation-adjusted) dollars, seasonally adjusted

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Total 9%: Private residential -2% (single-family -6%; multi 22%; improvements -5%); public residential 10%

Nonresidential 19% (private 21%, public 16%)

Nonresidential segments (in descending order of Sep. 2023 spending; combined new & renovation spending)

- Mfg. 62% (computer/electronic 135%; chemical 24%; food/beverage/tobacco 14%; transportation equipment 6%)
- Commercial 8% (warehouse 10%; retail 2%; farm 16%)
- Highway and street 10%
- Power 16% (electric 21%; oil/gas fields & pipelines -9%)
- Education 19% (primary/secondary 19%; higher ed 16%)
- Office (including data centers) 9%
- Transportation 7% (air 9%; private rail/truck 8%; transit -13%)
- Health care 15% (hospital 15%; medical building 21%; special care -10%)

- Other: Sewage/waste 26%; Amuse/recreation 15%; Water supply 12%; Communication 3%; Lodging 15%; Conservation/development 28%

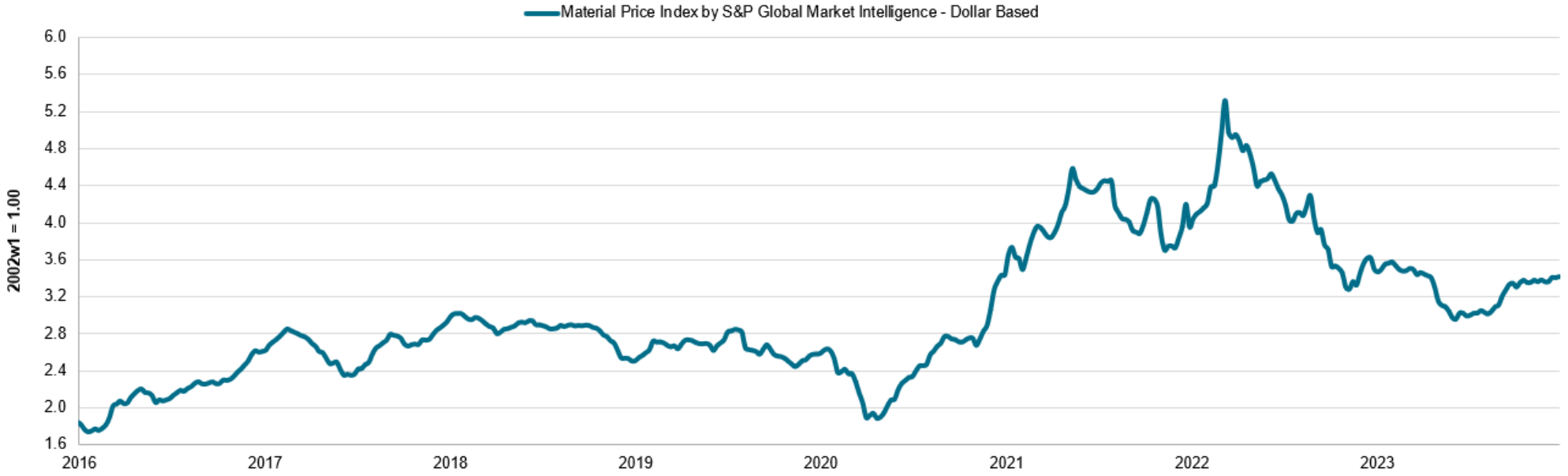
Material Price Index by S&P Global Market Intelligence

Pricing and Purchasing Service

Data week commencing: Monday, December 25, 2023

Index

Material price index - Dollar based



Data compiled January 2, 2024.

Source: S&P Global Market Intelligence.

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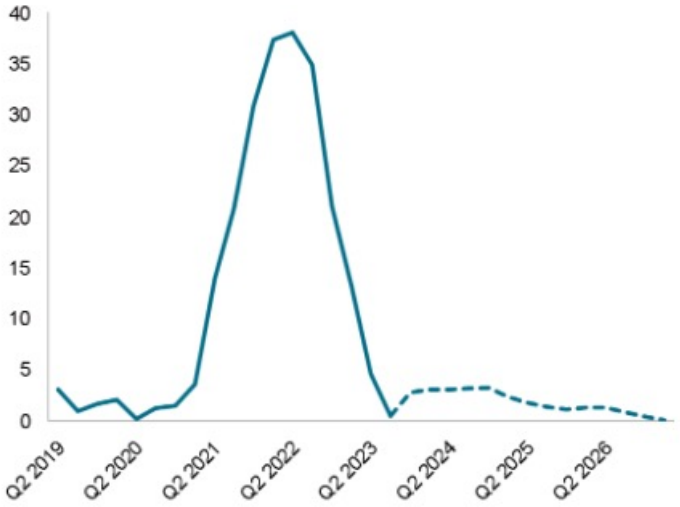
Transformers and Motor/Generator

Transformer prices, percent change YOY



Data compiled December 2023.
YOY = year over year.
Source: S&P Global Market Intelligence.
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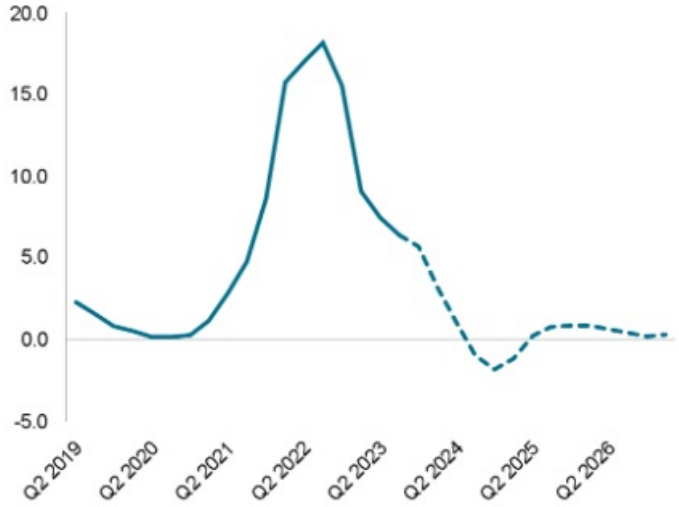
Motor and generator prices, percent change YOY



Data compiled December 2023.
YOY = year over year.
Source: S&P Global Market Intelligence.
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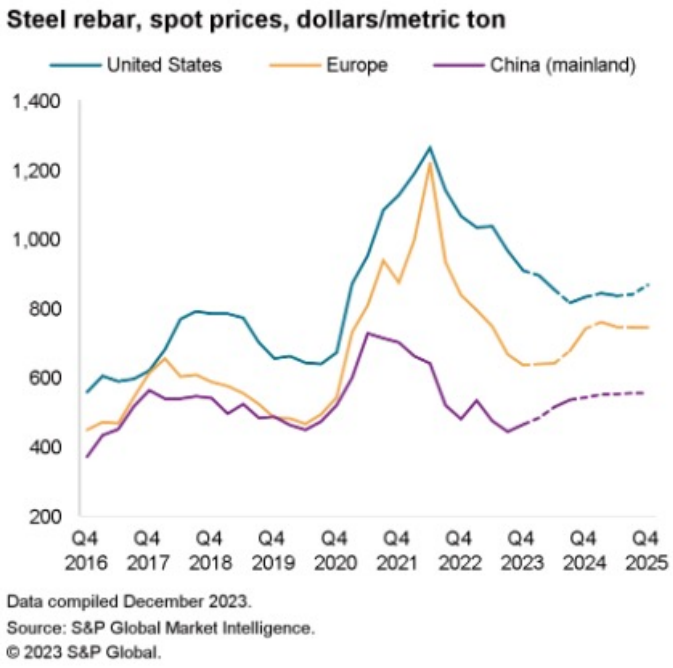
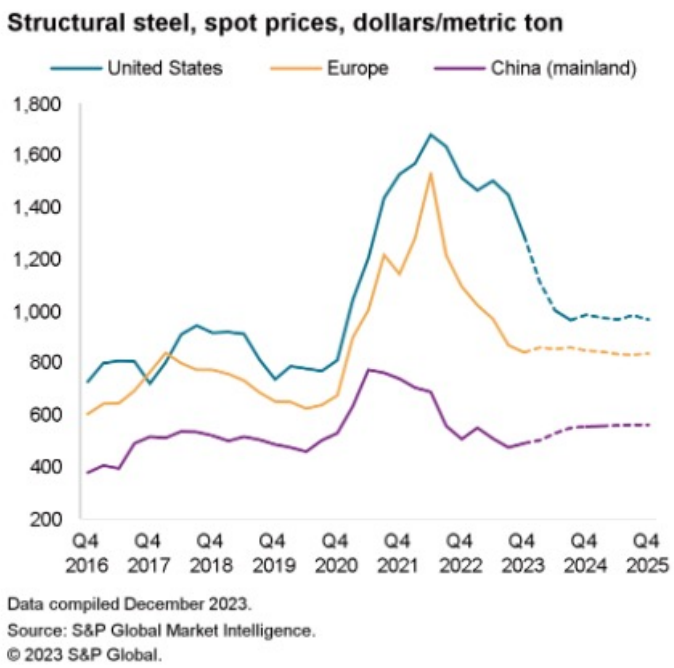
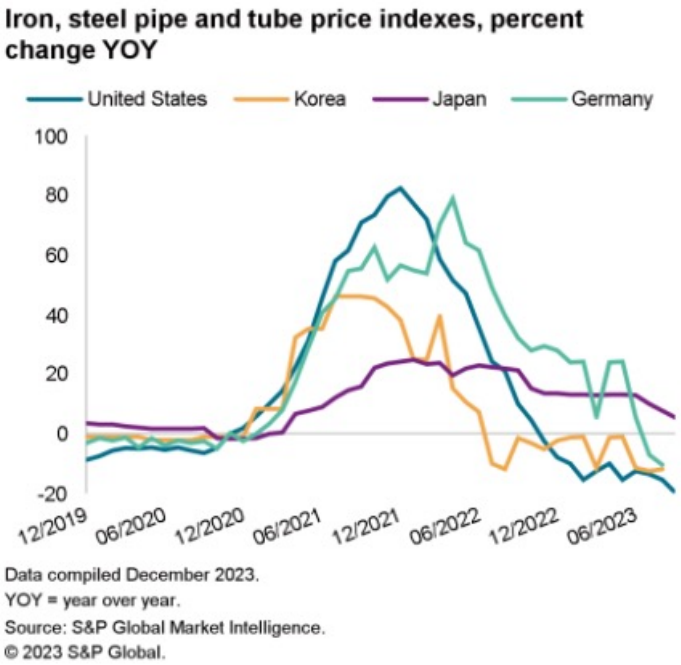
Steel Rebar and Structural

Structural steel

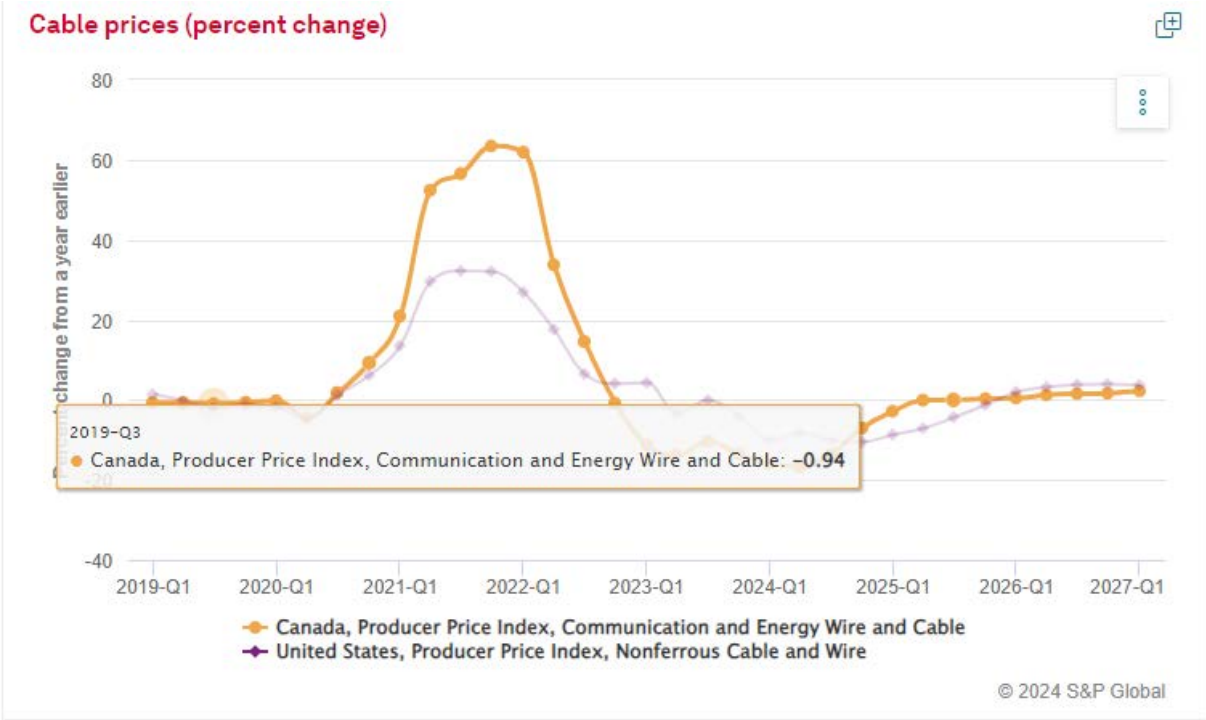




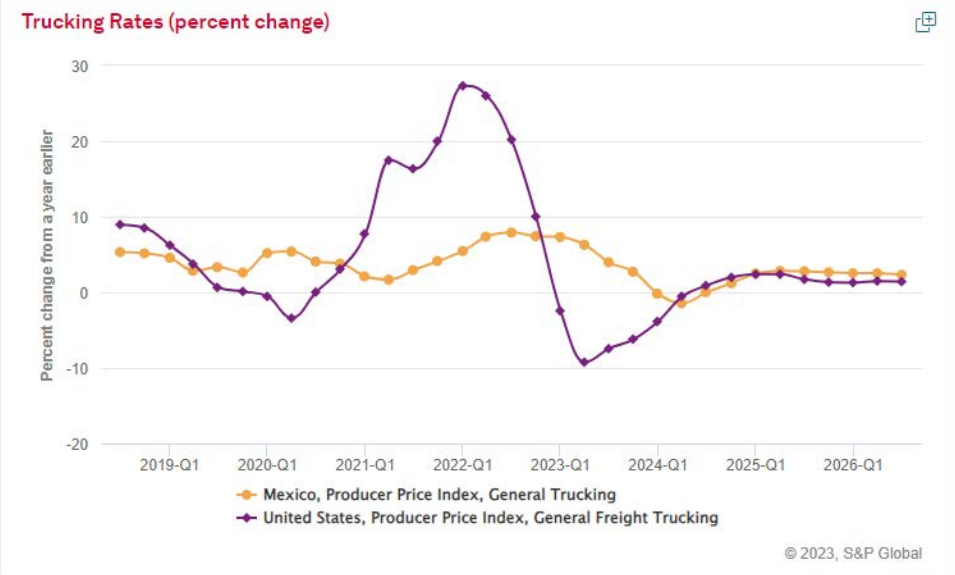
Steel Pipe



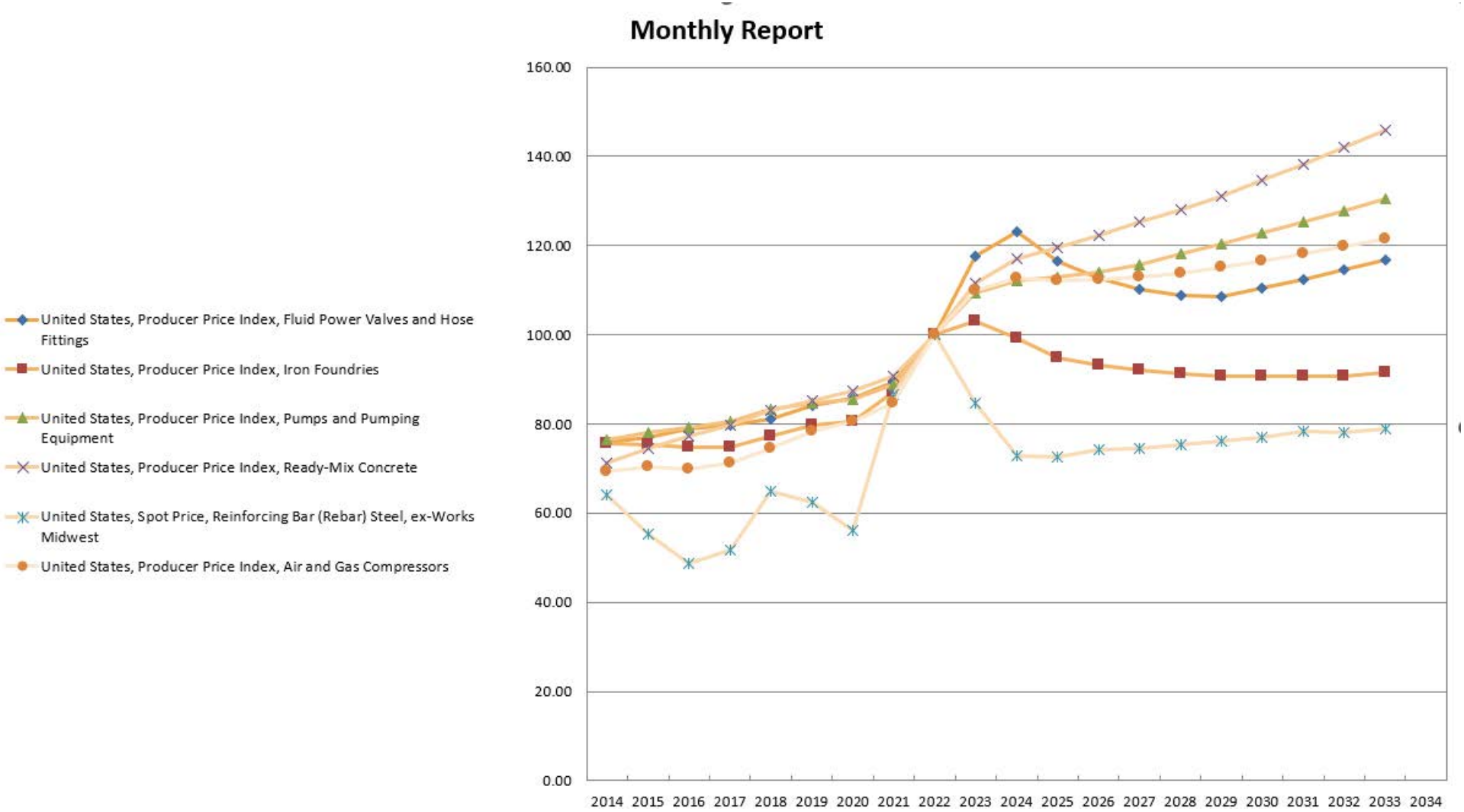
Wire and Cable Prices



Trucking Rates



Monthly Report



Current Material Information

ENR COST INDEX

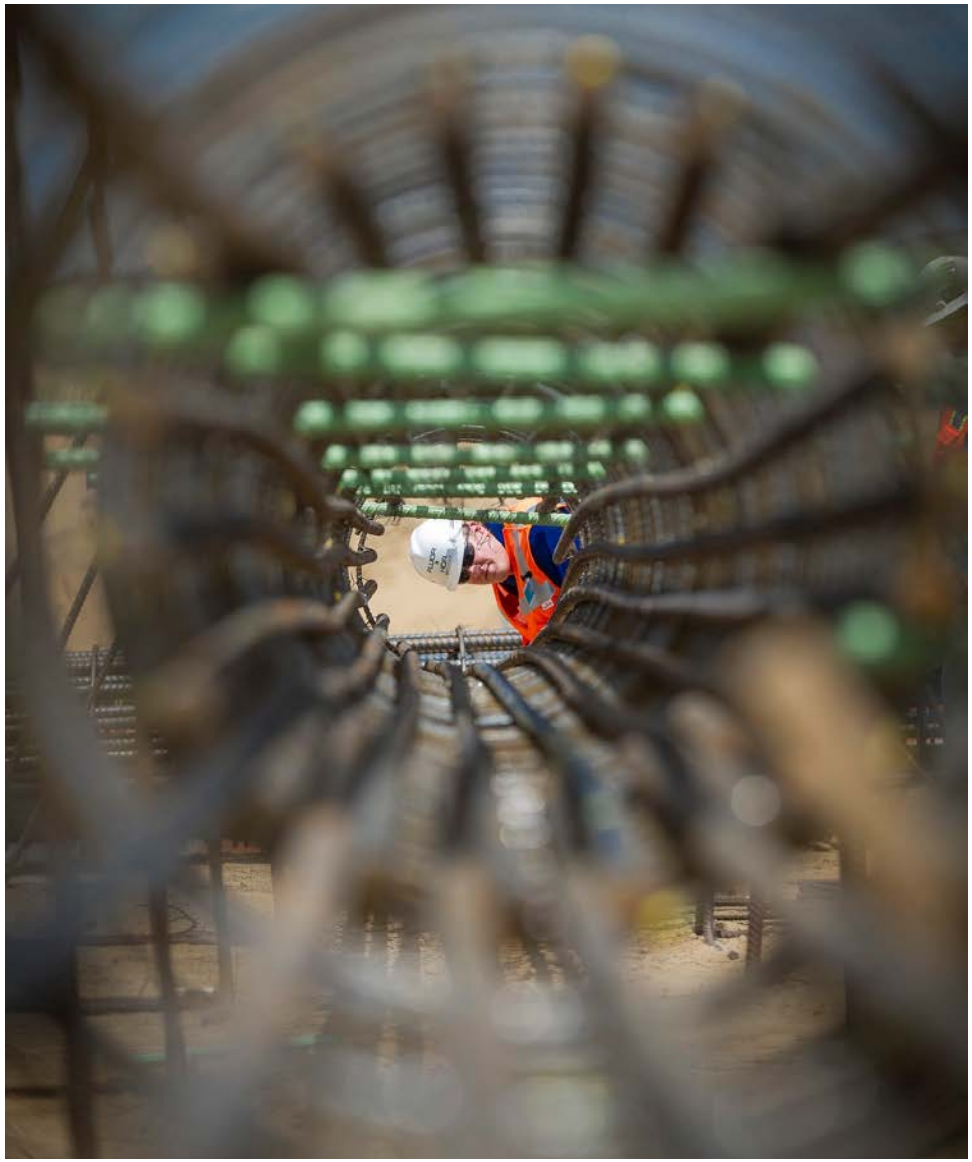
(Dec 2022 Vs Dec 2023)

Construction	
YTD	**+2.6%**
Los Angles	**+11.7%**
Building	
YTD	**+3.8%**
Los Angles	**+7.3%**
Material (cement, steel & lumber)	
YTD	**+0.1%**
Los Angles	**+0.6%**

Average Ready-Mix Concrete 4,000 psi = $178.56 CY National
4,000 psi = $107.94 CY 2012
5,000 psi = $192.79 CY National
4,000 psi = $202.58 CY Los Angles

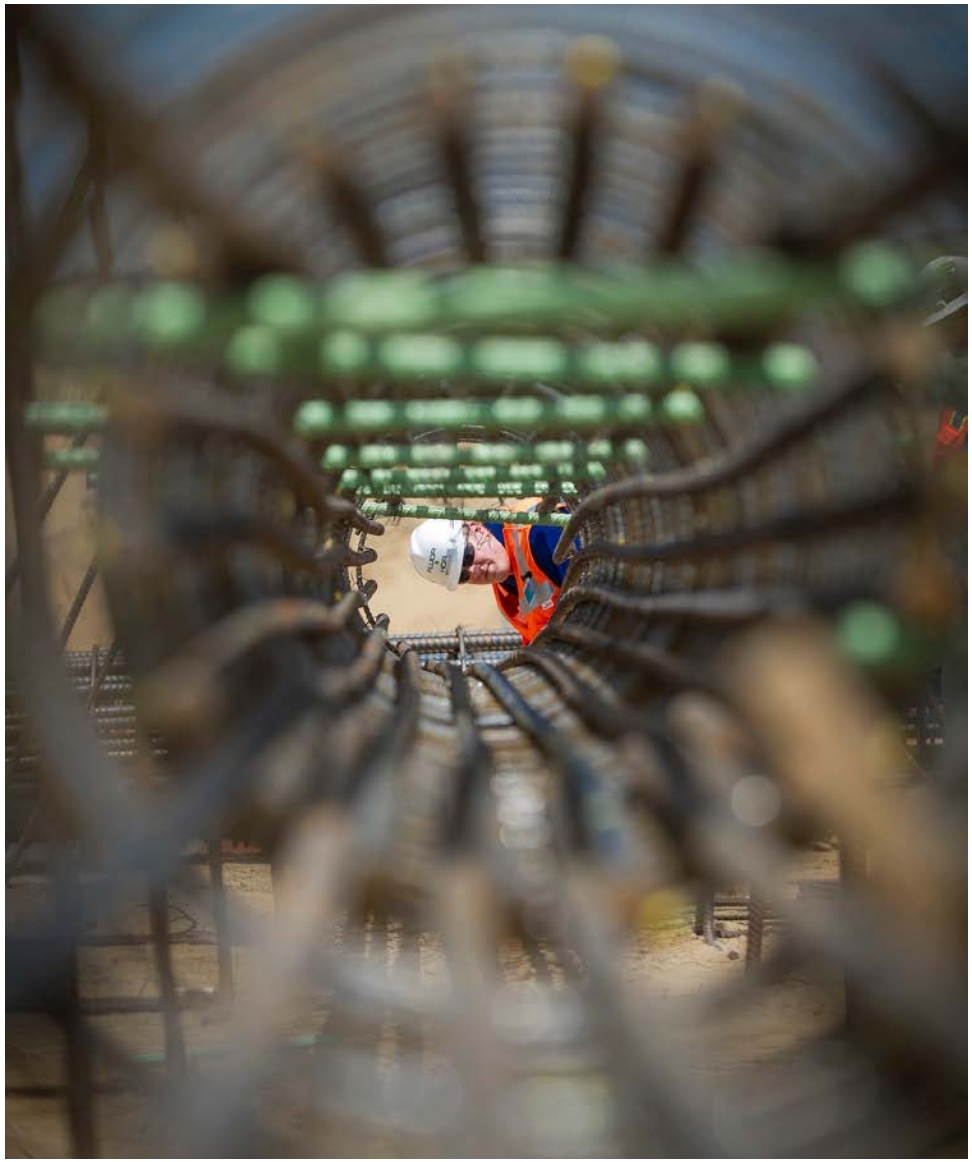
BLS DATA *(Nov 2022-2023)*

Ready-Mix Concrete	**+9.3%**
Steel Products	**-8.4%**
Steel Pipe	**-18.0%**
PVC Pipe	**-7.9%**
PVC Conduit	**-21.4%**
Copper Wire	**+0.1%**
Aluminum Mill Shapes	**-0.3%**
Fabricate Structural Metal	**+0.1%**
Fabricated Rebar	**+4.6%**
Prefabricated Metal Buildings	**+5.3%**
Stainless Steel Pipe	**-7.8%**
Ductile Iron Pipe	**-1.9%**
Diesel Fuel No. 2	**-29.6%**
Asphalt At Refinery	**-16.3%**
Truck Transportation of Freight	**-8.6%**



BLS DATA *(Nov 2021-2023)*

Ready-Mix Concrete	**+22.9%**
Steel Products	**-33.3%**
Steel Pipe	**-20.3%**
PVC Pipe	**+11.1%**
PVC Conduit	**-11.3%**
Copper Wire	**-8.1%**
Aluminum Mill Shapes	**-12.1%**
Fabricate Structural Metal	**+11.8%**
Fabricated Rebar	**+9.1%**
Prefabricated Metal Buildings	**+2.7%**
Stainless Steel Pipe	**+5.7%**
Ductile Iron Pipe	**+14.5%**
Diesel Fuel No. 2	**+12.2%**
Asphalt At Refinery	**-2.7%**
Truck Transportation of Freight	**+1.3%**



Cost squeeze on contractors can reappear suddenly, last 2+ years

Difference between year-over-year change in materials costs vs. bid prices, Jan 2007-Sep 2023

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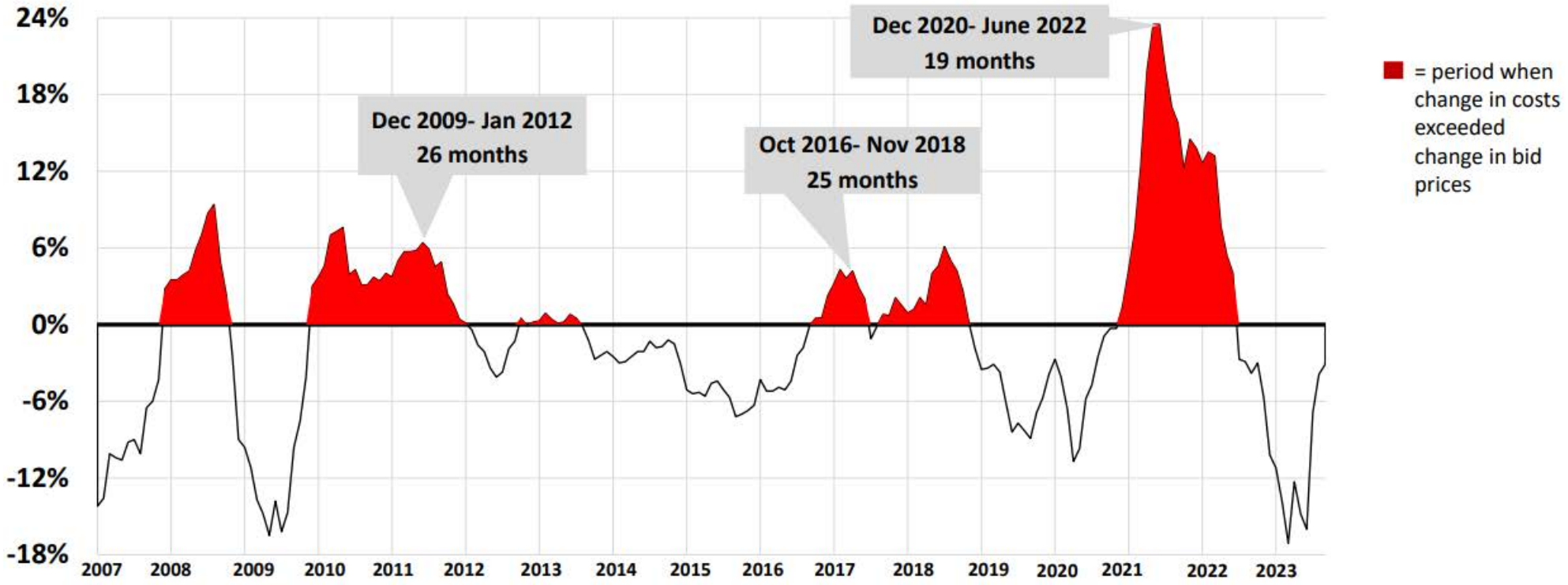

Supply-Chain Issues

AGC REPORTS

- **Longer fabrication times**
  - Pre-engineered metal building – 48 week lead time supplier May 2022
  - Ductile Iron Pipe – 26 week lead time 38 weeks for Protecto 401 + new Scrap Iron surcharge
  - PLC Components – 6 months lead time Power Panel 12 month lead time
- **Plant shutdowns and transportation issues**
  - Port of Long Beach and LA - 0 ships – trucker shortage +30% (80,000)
  - New California emission standards – trucks – 50% blocked from entry to ports
  - Current China Covid-19 Lockdown – has from 201 to 82 ships waiting to unload – a ripple effect
- **Texas freeze and Hurricane Ida effects on plastics, glues, and resins**
  - PVC pipe, fiberglass, vinyl siding, moisture barriers, paint, coatings, geotextiles, roofing, insulation, plywood, oriented strand board, i-joists, wraps – Inputs Was +170% Now -6.6%

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Supply-Chain Issues

- **Longer fabrication times**
  - Pre-engineered metal building – 48-week lead time
  - Roofing materials – 4 to 6-month lead time
  - Ductile Iron Pipe – 26-week lead time 38-weeks for Protecto 401 + new Scrap Iron surcharge
  - Ductile Iron Pipe – 4” to 12” – one year lead time. Developers are buying it all up.
  - PLC Components – 6-months lead time Power Unit 12 months lead time.
  - Primary Transformers – 5,000 kVA – 70 Weeks – one project 150 weeks.
  - Secondary Transformers – 2,500 kVA – 60 Weeks
  - Switchboard – 480/277V – 50 Weeks
  - VFD – 480/277 V – 40+ Weeks
  - Process Equipment and Pumps – 30 Weeks to 40 Weeks.

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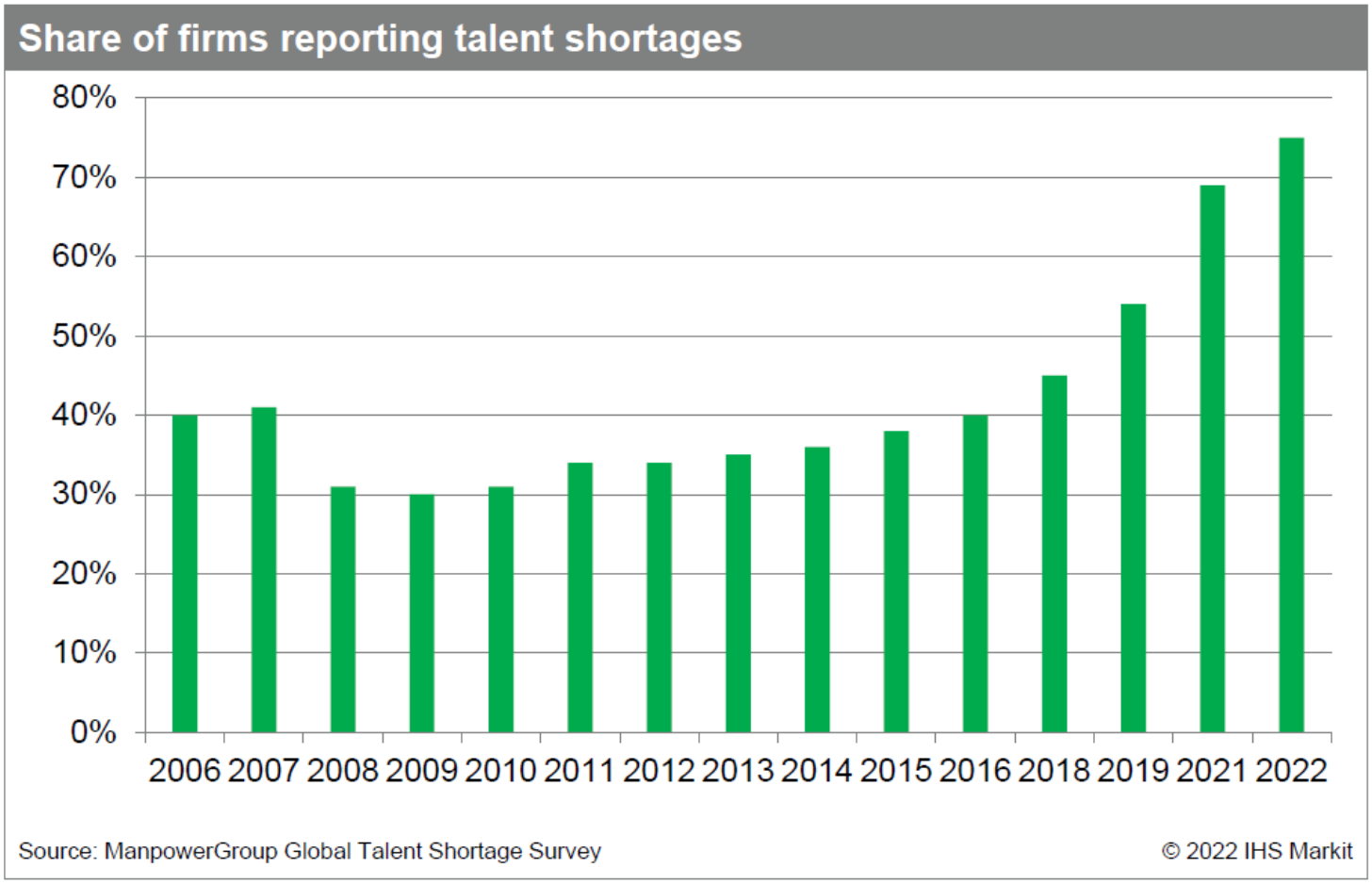
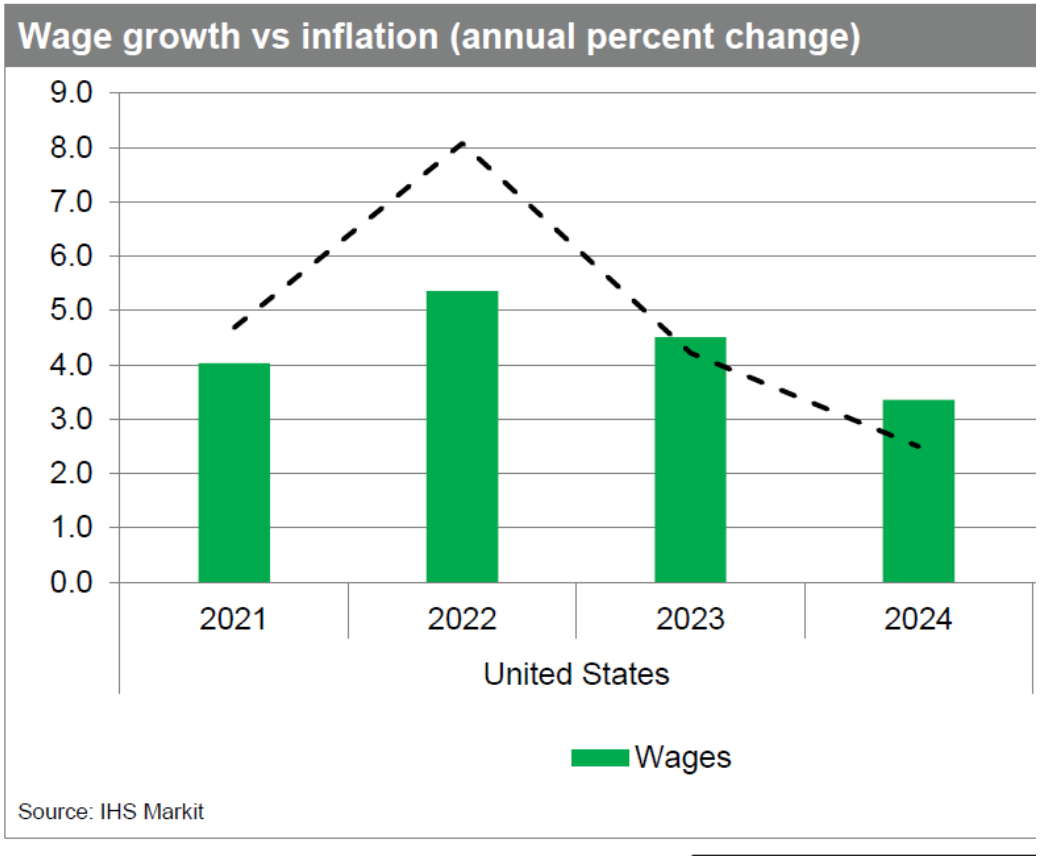
Labor Issues

Significant Labor Shortages



Wage Growth Will Remain Elevated into 2023, Easing 2024

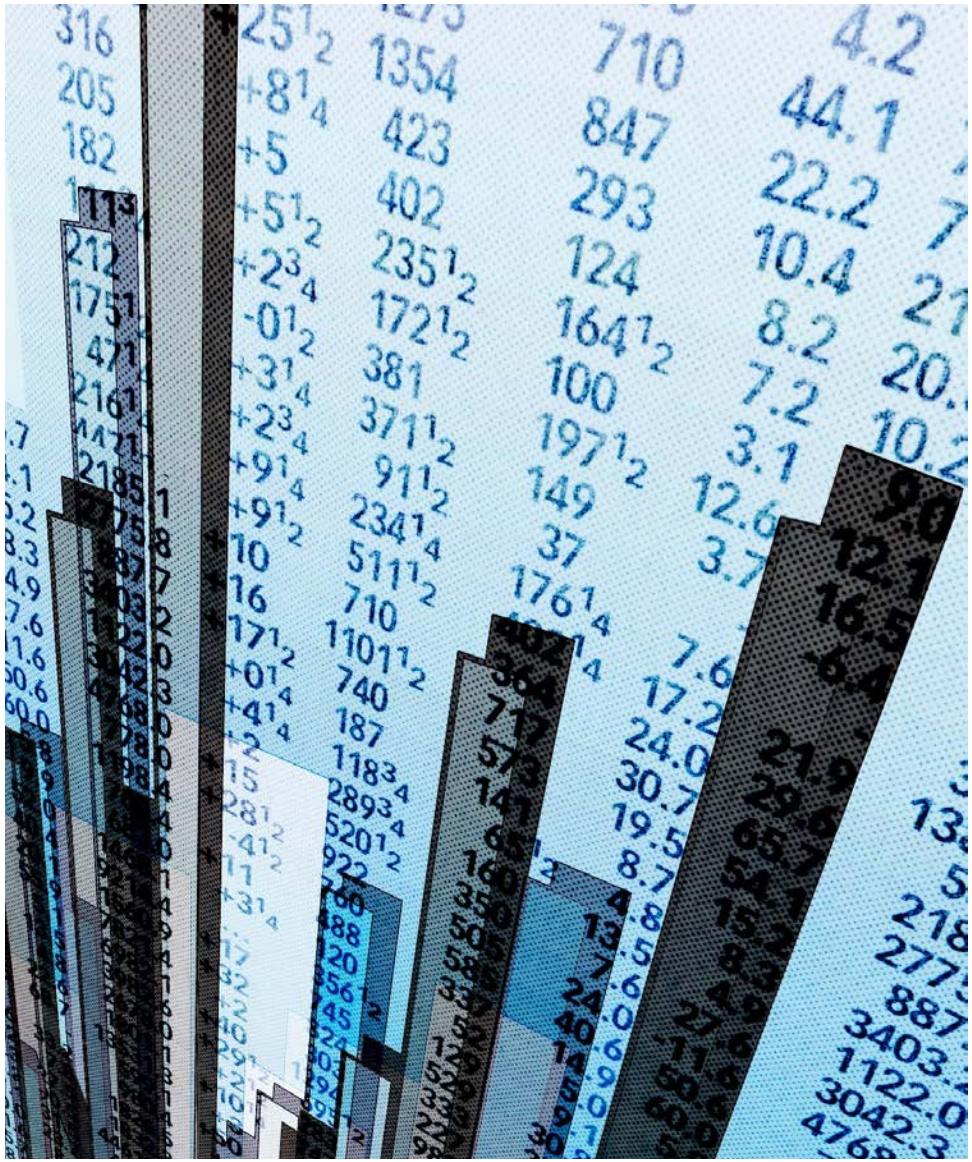


Price Volatility and Bidding Environment

Price Volatility

AGC REPORTS

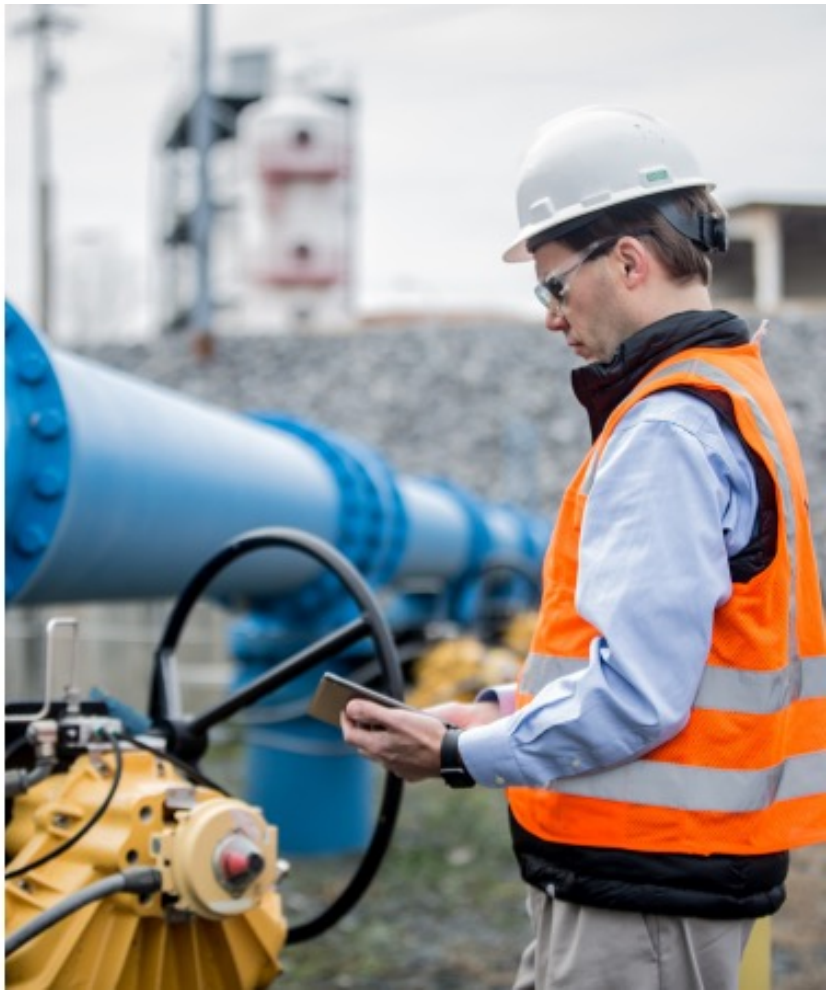
- Drastic shortening of producers to hold their prices
- Monthly price increases
- 1-day to 5-day price guarantee
- Price-increase on steel the day after the increase took effect



Bidding Environment

JUNE/JULY 2021

- **Solids Handling**
  - OPCC $137.5M / Low Bid 179.8M = 23.5%
    Higher than OPCC = $42.3M
  - Spread 3 bidders – Low to High 20.3%
- **Dam Removal**
  - OPCC $14.5M / Low Bid $18.1M = 24.4%
    Higher than OPCC = $3.5M
  - Spread 5 Bidders – Low to High 47.6%
- **Water Treatment – Filter Upgrade**
  - OPCC $165M / Low Bid $235M = 42.4%
    Higher OPCC = $70M
  - Spread 2 Bidders – Low to High 6.4%



Current Bidding Environment (HDR)

November 2021 to Nov 2022

- Digester Project - Washington State
  - OPCC $13.4M / Low Bid $14.4M +8.0%
  - 6 Bidders – 6.8% Spread Low to High
- Biosolids Handling Facility - North Carolina
  - OPCC $30M / Low Bid $34.8M +15%
  - 3 Bidders – 3.9% Spread Low to High
- Pump Station – Virginia
  - OPCC $13.5M / Low Bid $19.1 +29.2%
  - 1 Bidder
- Pump Station – Virginia
  - OPCC $2.3M / Low Bid $3.1M +37.3%
  - Two Bids

Infrastructure Bill

Administration – Requires Steel Act and Buy American (April 2022)

NEW + BASELINE CONSTRUCTION – RELATED FUNDING INCLUDED IN THE SENATE INFRASTRUCTURE BILL

ROADS & BRIDGES
$351B

TRANSIT
$146B

PASSENGER & FREIGHT
$102B

WATER INFRASTRUCTURE
$60B

BROADBAND
$45B

AIRPORTS
$45B

PORTS & WATERWAYS
$17B

POWER & GRID
$17B

ELECTRIC VEHICLE INFRASTRUCTURE
$7.5B

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Russian Invasion of Ukraine - Impacts

Russian Invasion of Ukraine

S&P REPORTS

- **Everything Changed**
  - Many Metals at Multi-Year Highs – Steel, Aluminum, Neon
  - Beware of Supply Shocks – Steel Will Be Major Issue (Supply and Raw Materials)
  - Electrical Steel – Motors, Generators, Transformers – Supply Shortage and Extreme Price Increase
  - Ports, Rail, and Truck Backlog Still Exist
  - Pig Iron (Use in Steel/Castings Mfg) – Russia Exports 40% and Ukraine Exports 20%
  - Year/Year and 2 Year Change:
    - Transformers +2.5% Y/Y and 23.1% 2 years
    - Switchgear/Switchboard +7.5% Y/Y and +29.3% 2 years
    - Motors/Generators +4.9% Y/Y and +20.2% 2 years
    - Pumps and Compressor +5.8% Y/Y and +23.5% 2 years
    - Fans and Blowers +1.4% Y/Y and +14.8% 2 years
    - Valves +4.4% Y/Y and +20.3% 2 years

Buy American Act

Buy American Act – Impacts to Projects

- Required if State or Federal loans are used.
- Steel – from melting process through the coating process.
- To be manufactured in the United States if the cost of components mined, produced, or manufactured in the United States accounts for at least 55% of the cost of all components or the end product.
- EPA has set up a separate group for reviewing wavers – which may be more difficult to obtain.

- Includes
  - Steel Products
  - Any item Manufactured from Steel
  - Non-Ferris metals (Copper, Aluminum)
  - PVC and Polymers
  - Glass
  - Lumber
  - Drywall

- Not required
  - Ready-mix concrete
  - Aggregate
- Include in OPCC:
  - 10% to 15% on qualified materials
  - Contractor – 1 Full-Time Person for 6 months to handle the paperwork on $25M job.
  - Adds 4% to 5% overall.

Suggestions and Actions

Capital Planning – How to Handle Market Conditions

- Use Local Published Data (Ex. Saylor Consulting in San Francisco)
    - Recommending 5% per year escalation rate
- Check Labor Conditions and Material Price Trends
- Check Schedule and Site Constraints
- Update all Capital Plans with Escalation and Market Volatility Adjustment Factor
- Keep track of historical bids

KEY ACTIONS:

- Define Scope Early
- Ensure proper Design Contingency at each design phase
- Properly calculate escalation using realistic milestones – for materials and labor
- Include a market volatility adjustment factor – 3% to 20% for pricing and supply-chain issue

Pete's Perspective

- **Not a short-term problem**
- Volatility – Combination of material prices, supply-chain issues, price uncertainty
- Suggested actions:
  - Update any OPCC older than 1 year
  - Update the final estimate prior to the bid date
  - Get updated process equipment or pipe quotes
  - Encourage Owners to budget for change orders and include escalation clauses

Market Volatility Adjustment Factor

Inputs to Market Volatility Adjustment Factor

- Supply-chain issues
- Price volatility
- Transportation issues
- Labor shortages
- Labor premiums to keep craft labor (+$5/hr to +$8/hr)
- Longer than normal lead times (ductile iron pipe 6-9 months)
- Covid-19 mandates
- Russian invasion of Ukraine
- China lockdown – 201 Ship
- Factor 3% to 20% - This is in addition to Escalation.

Questions