

Wood Markets Update

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19th Annual Sustainable Forestry Conference

Florence, WI

April 17, 2024

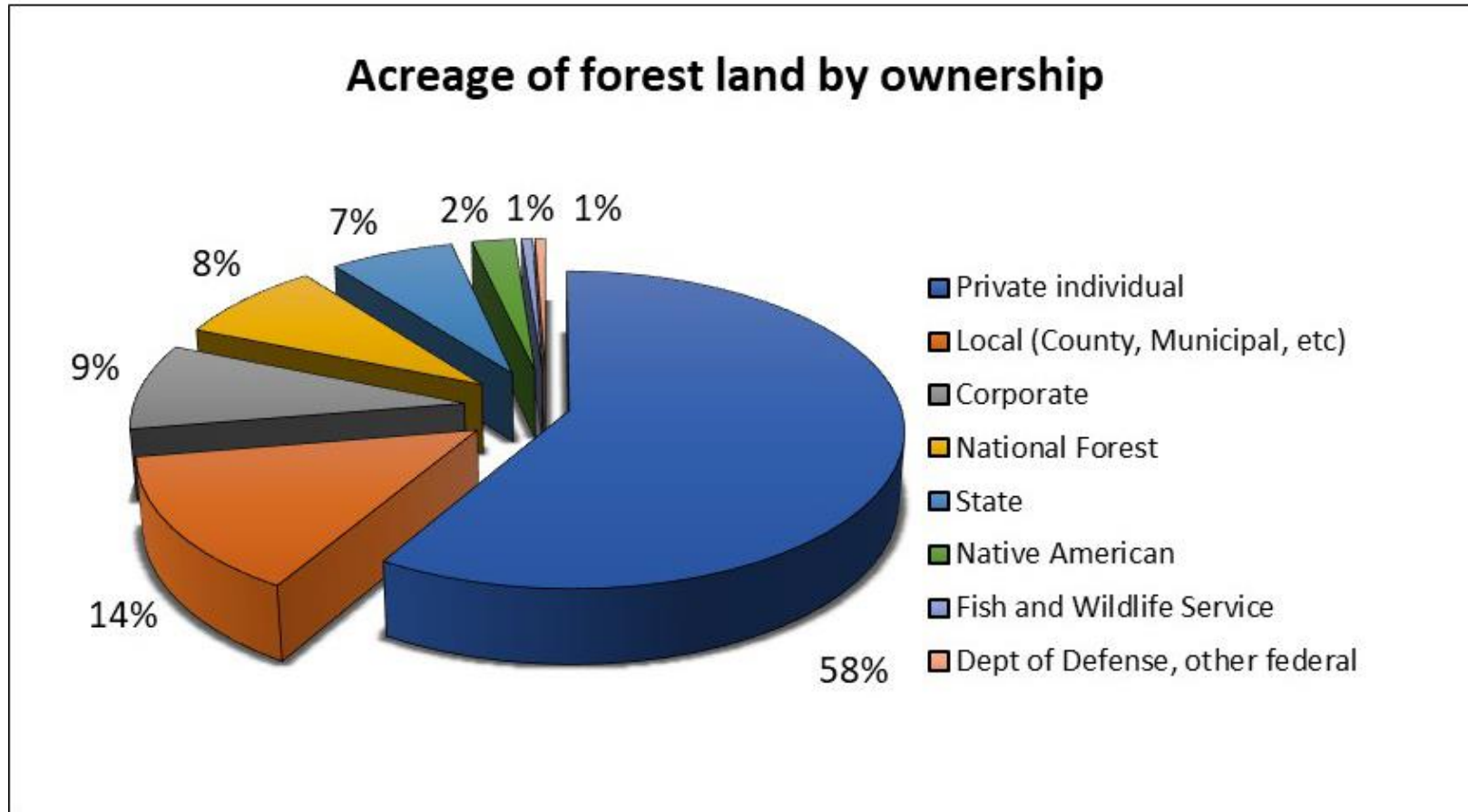


Outline

- Brief Review of Wisconsin's Forests
- Brief Update on Housing
- Softwood Lumber Markets
- Hardwood Lumber Markets
 - Domestic
 - China
 - Where are New Opportunities?
 - Update on EUDR
- Brief Comments on Pulp & Paper Markets
- Closing Remarks

Brief Review of Wisconsin's Forests

Forest Ownership in Wisconsin



Source: 2021 WI DNR

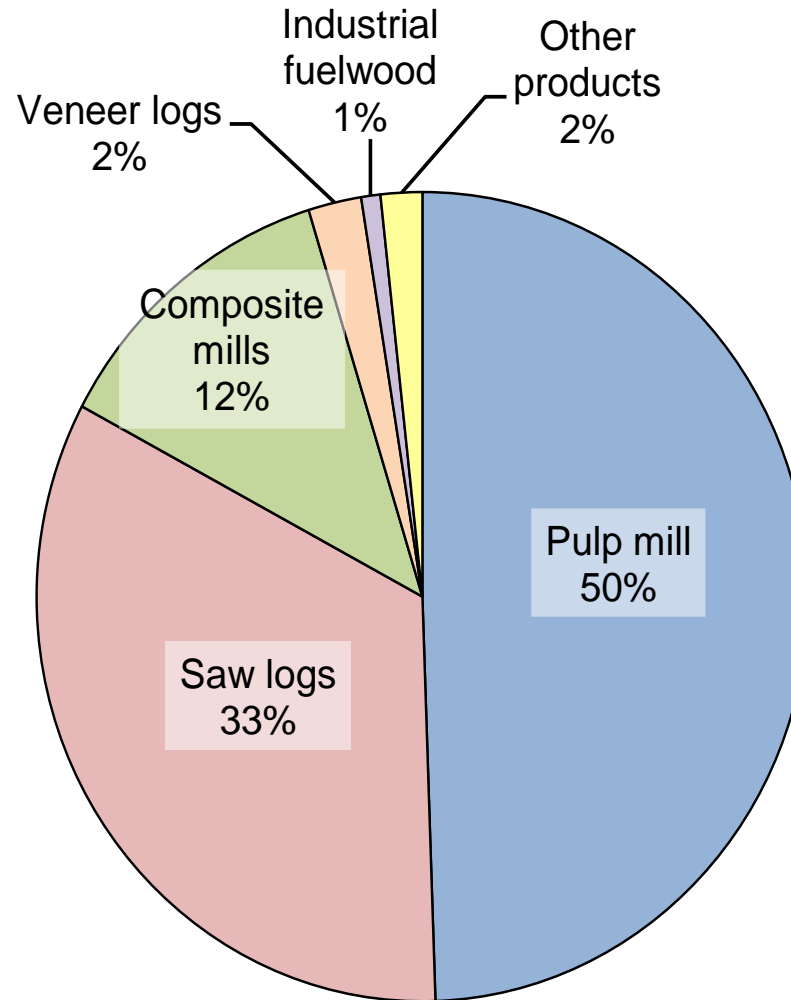
Forest Harvests by Ownership

| Ownership category | Minnesota | | Wisconsin | |
|--------------------------------------|-----------|------|-----------|------|
| | 2016 | 2021 | 2016 | 2021 |
| Non Industrial Private Forest (NIPF) | 20% | 37% | 52% | 66% |
| Industrial | 15% | 3% | 4% | 5% |
| National | 7% | 4% | 6% | 3% |
| State | 27% | 29% | 10% | 6% |
| County/Municipal | 30% | 25% | 27% | 18% |
| Tribal | 1% | 2% | 1% | 1% |

(Source: 2022 WI Loggers Study)



Raw Material Use in WI



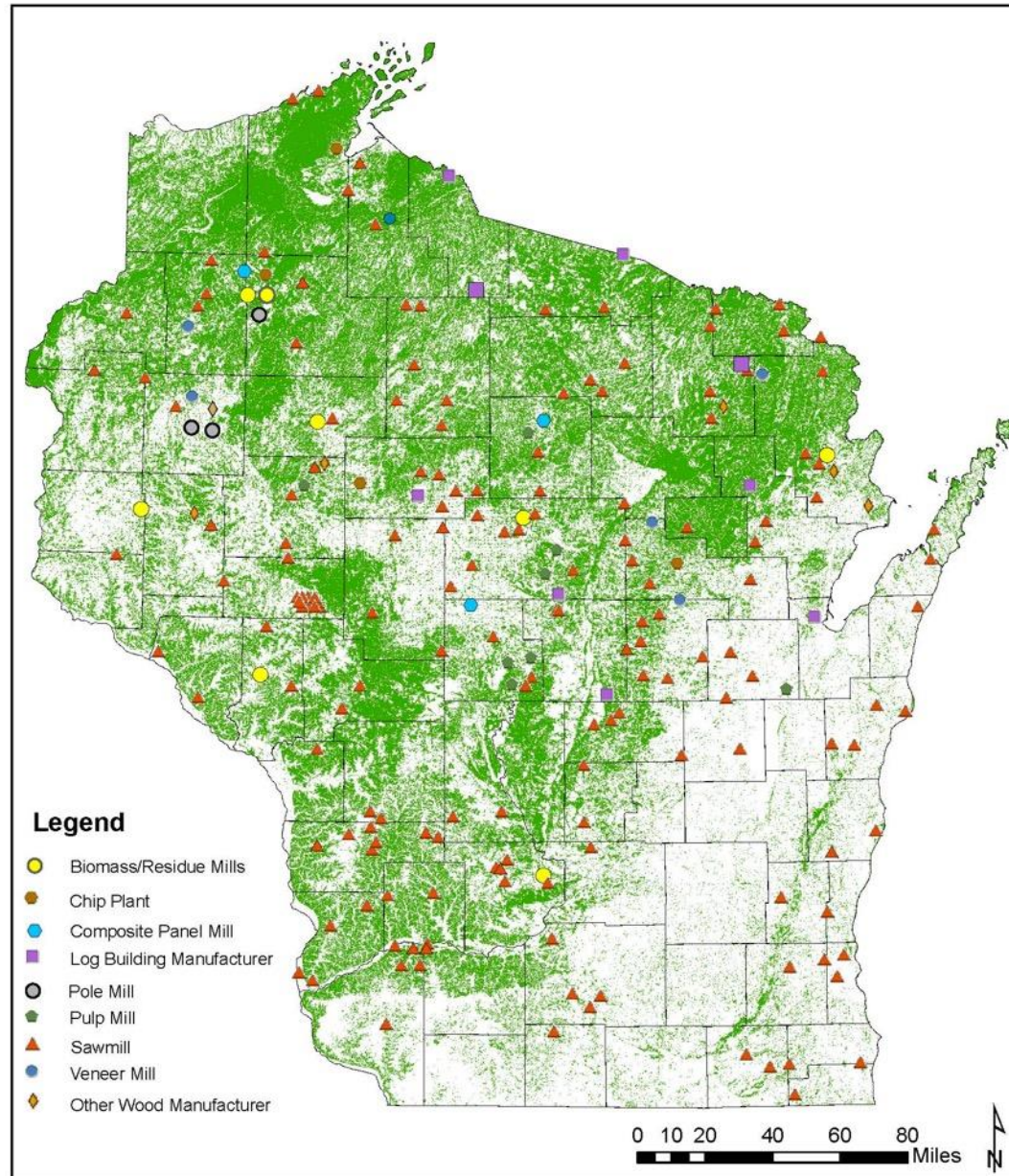
(Source: WI Timber Products Output, 2018)

Forest Products Industry Listings

Preparation Date: 05/22/2020

Prepared By: Forest Products Services (FPS) Staff

Data Taken from 2019 Timber Products Output (TPO) Survey

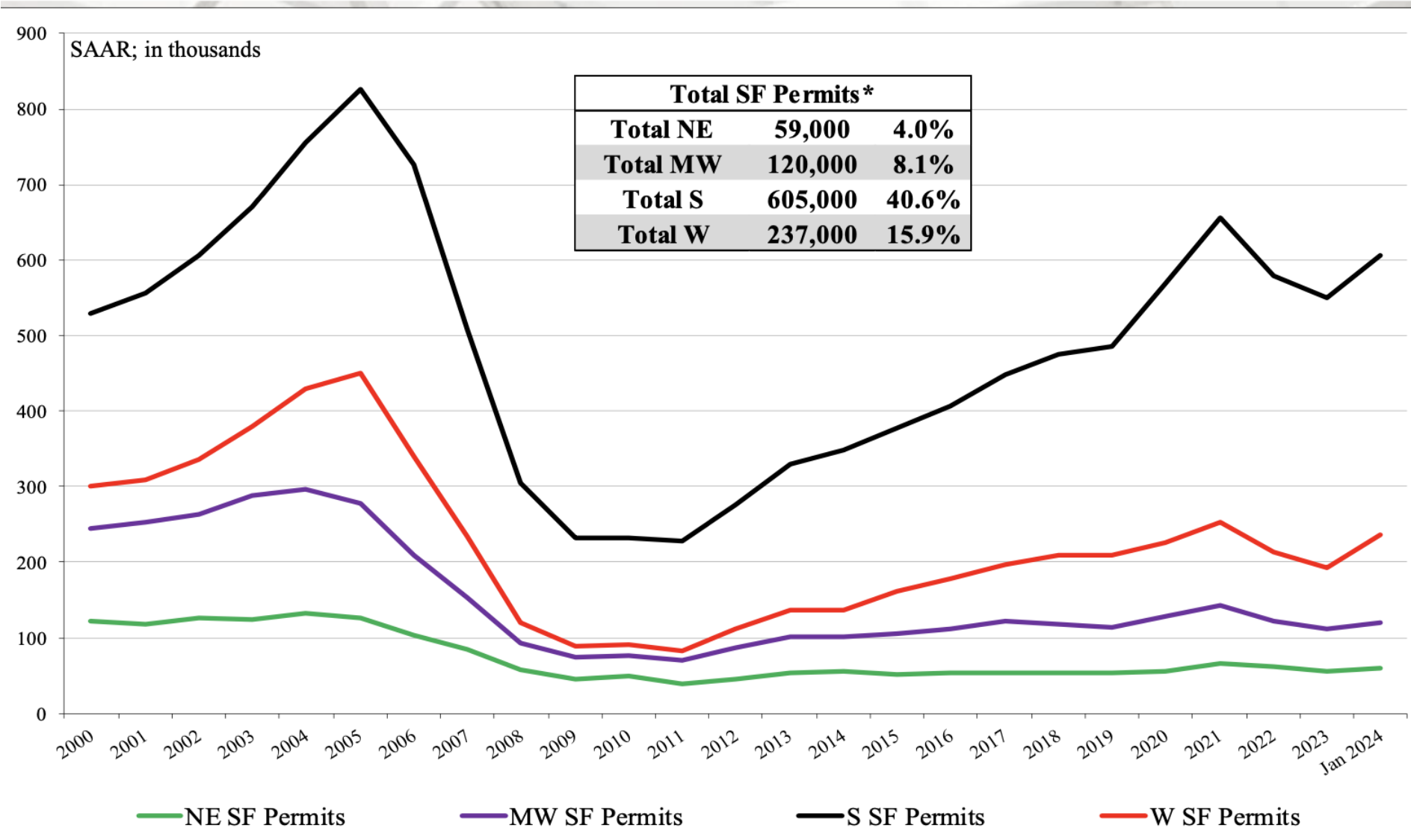


Brief Updated on Housing

US Housing

- New construction is the driver for the softwood/hardwood markets – and remodeling for hardwoods.
- Existing home sales will have a tough time gaining real momentum in a limited inventory environment where **most homeowners are rate-locked** into their homes – you can't buy what is not for sale.
- A higher mortgage rate environment resulting in a bifurcated market – the haves and have nots. The former are the ones building and buying.
- 77% of agents report that buyers outnumber sellers - reignited bidding wars for the limited supply of homes.
- Millennials will drive 12.7 new households in the 2020s, ~17.1 million new homes will be needed during the decade to meet demand and make up for the current shortage of 1.7 million homes.

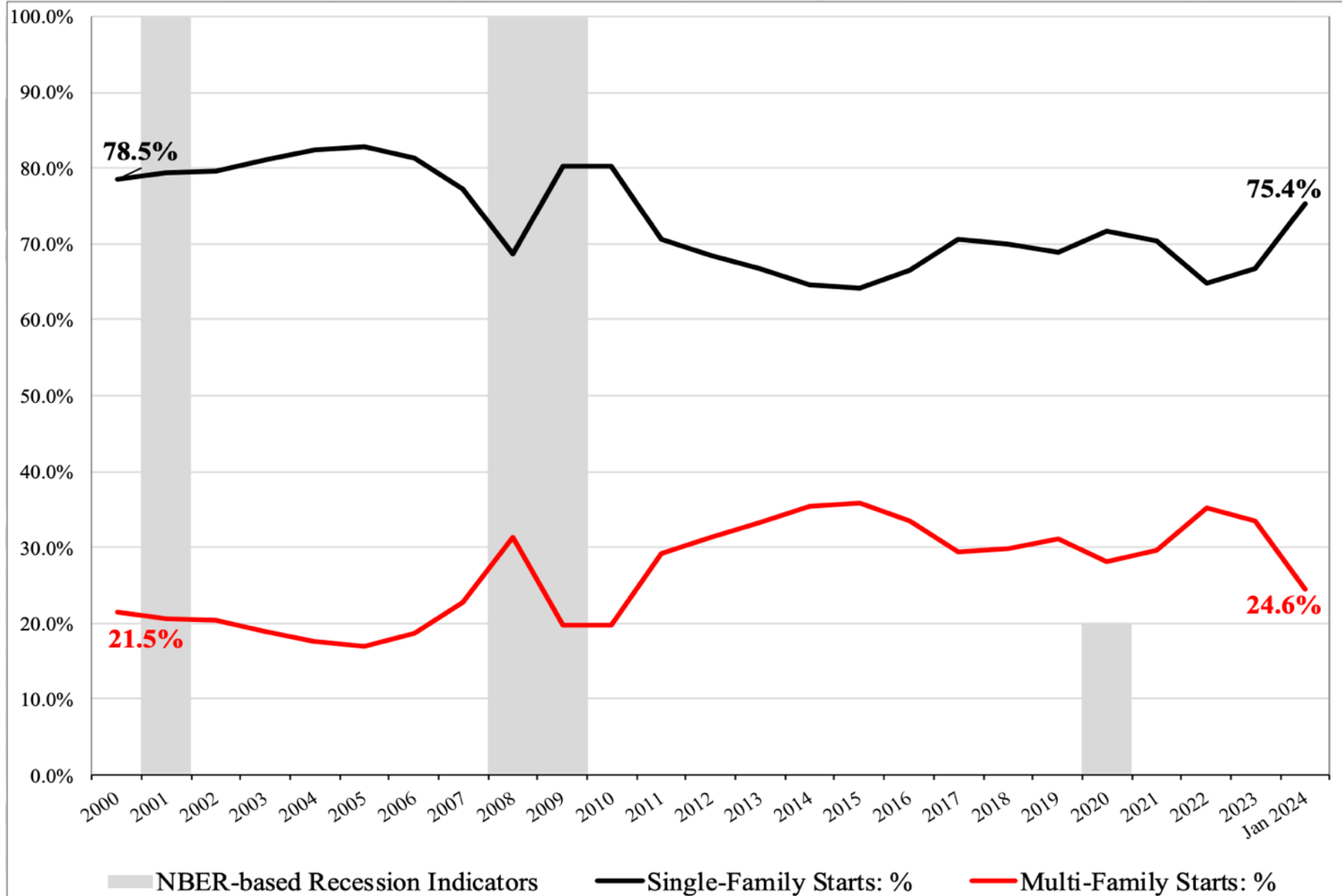
SF Housing Permits by Region



NE = Northeast, MW = Midwest, S = South, W = West

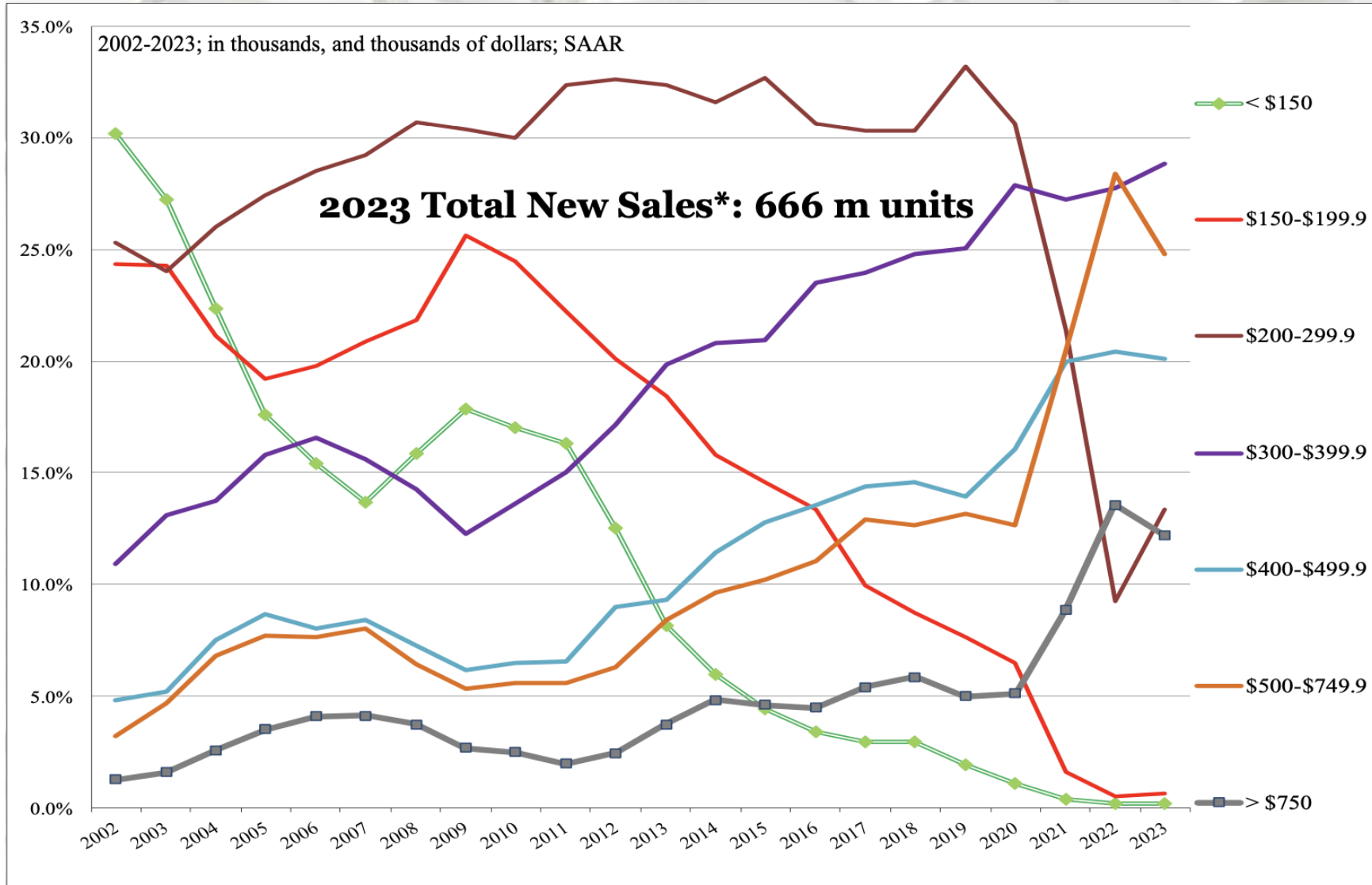
* Percentage of total permits.

SF vs. MF Housing Starts (%)



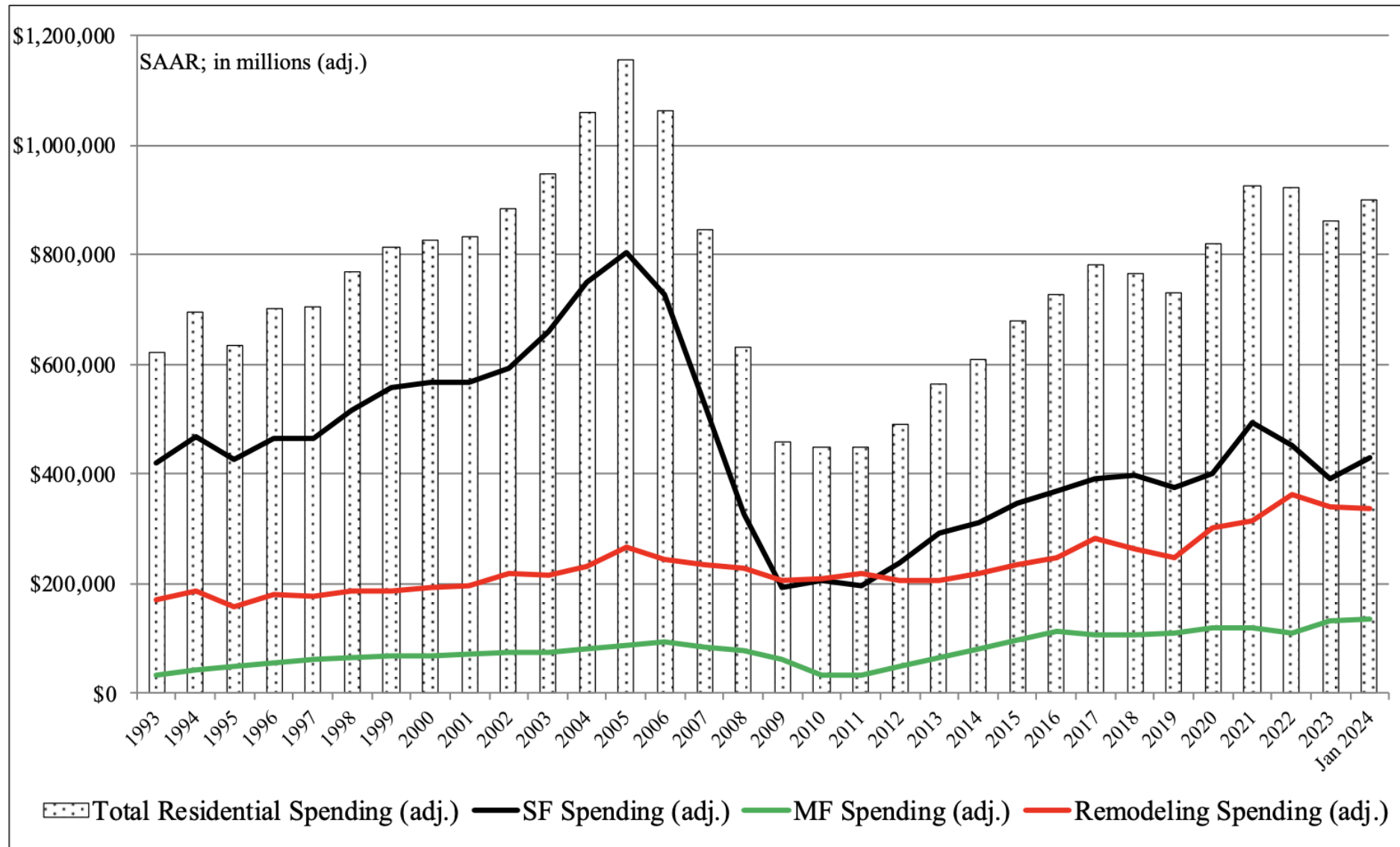
NBER based Recession Indicator Bars for the United States from the Period following the Peak through the Trough (FRED, St. Louis).

New SF House Sales by Price Category



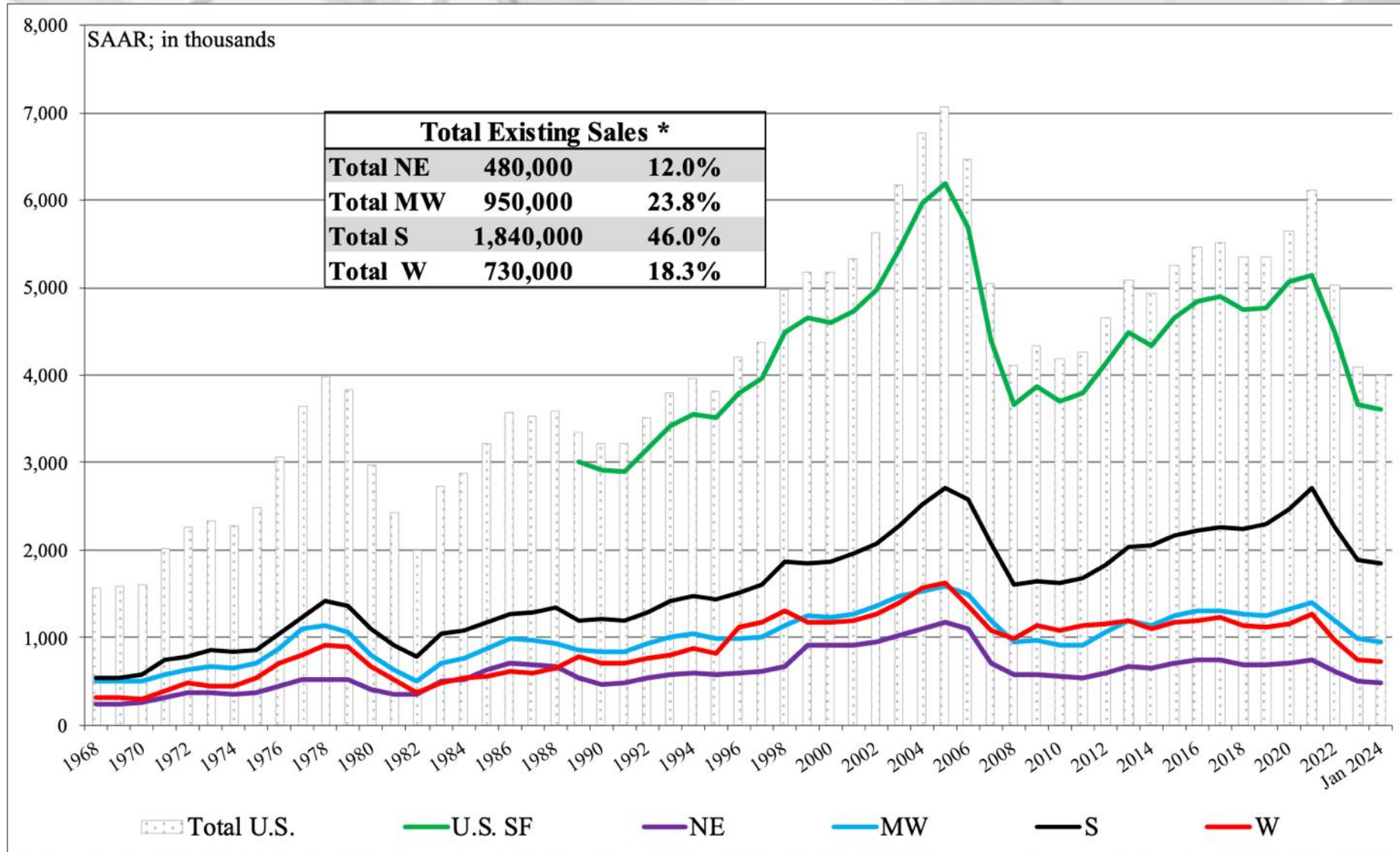
* Sales tallied by price category, nominal dollars.

Total Construction Spending (adjusted): 1993 – January 2024



Reported in adjusted \$US: 1993 – 2021 (adjusted for inflation, BEA Table 1.1.9); January 2024 reported in nominal US\$.

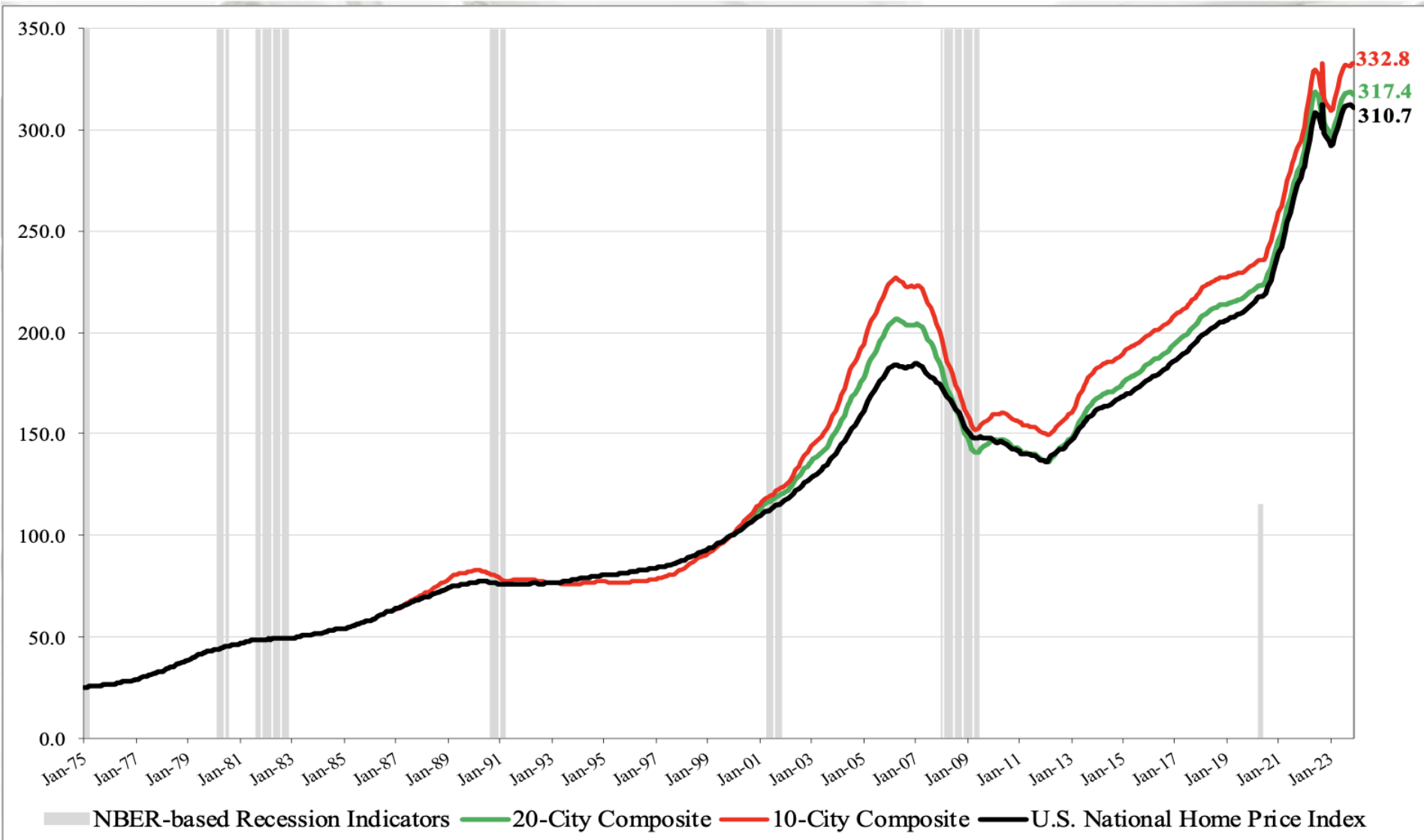
Existing House Sales



NE = Northeast; MW = Midwest; S = South; W = West

* Percentage of total existing sales.

S&P/Case-Shiller Home Price Indices





* NBER based Recession Indicator Bars for the United States from the Period following the Peak through the Trough (FRED, St. Louis).

Problems in US Housing

- Mortgage interest rates remain higher than pre-pandemic
 - Mean = 7.74 % (1971 until 2023), High = 18.63% in 1981, 2.65% in 2021.
- Only 8% of the 25-million Millennials/Gen X currently qualify for a loan.
- 96.5-million households cannot afford a median priced new house.
- Unaffordability:
 - Existing sales: Jan '24 median price, **\$379,100**
 - New Sales: Jan '24 median price, **\$420,700**

<https://woodproducts.sbio.vt.edu/housing.html>

**The Virginia Tech–USDA Forest Service
Housing Commentary: Section I
June 2023**

| | |
|---|--|
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Softwood Lumber Markets

Softwood Lumber Markets

- Home construction.
- Softwood dimension lumber.
 - Studs
 - 2x4
 - 2x6
 - 2x8 and so on...
- 35% of softwoods used in USA are made in Canada.

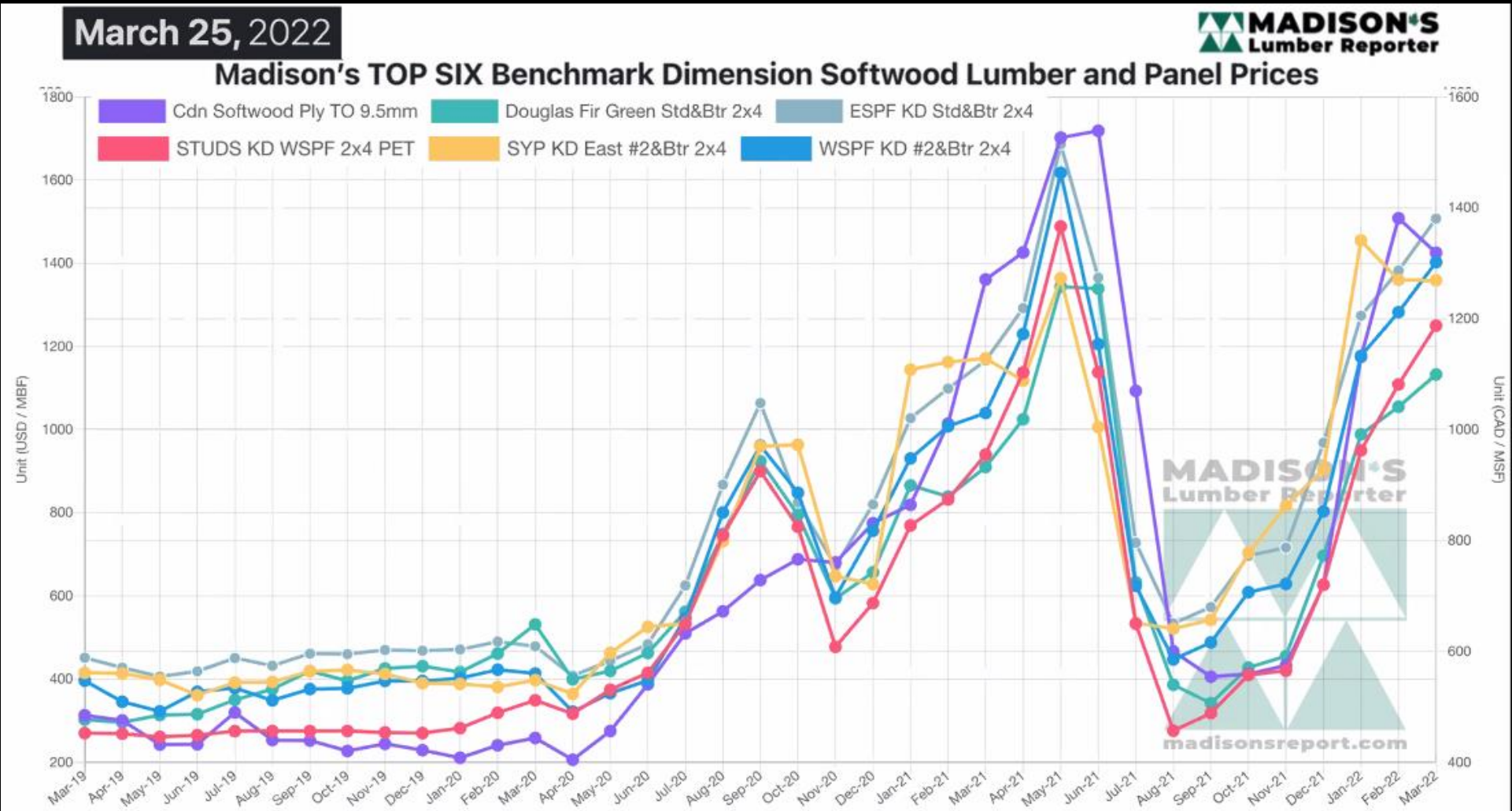
Softwood Lumber Markets

- Repair & remodel and single-family construction
 - comprise ~65-70% of softwood lumber demand
 - ~70-75% of oriented strand board (OSB) demand
 - A rough rule-of-thumb suggests that each single-family home utilizes ~15,000 board feet of lumber and ~10,000 square feet of panels (OSB and plywood)

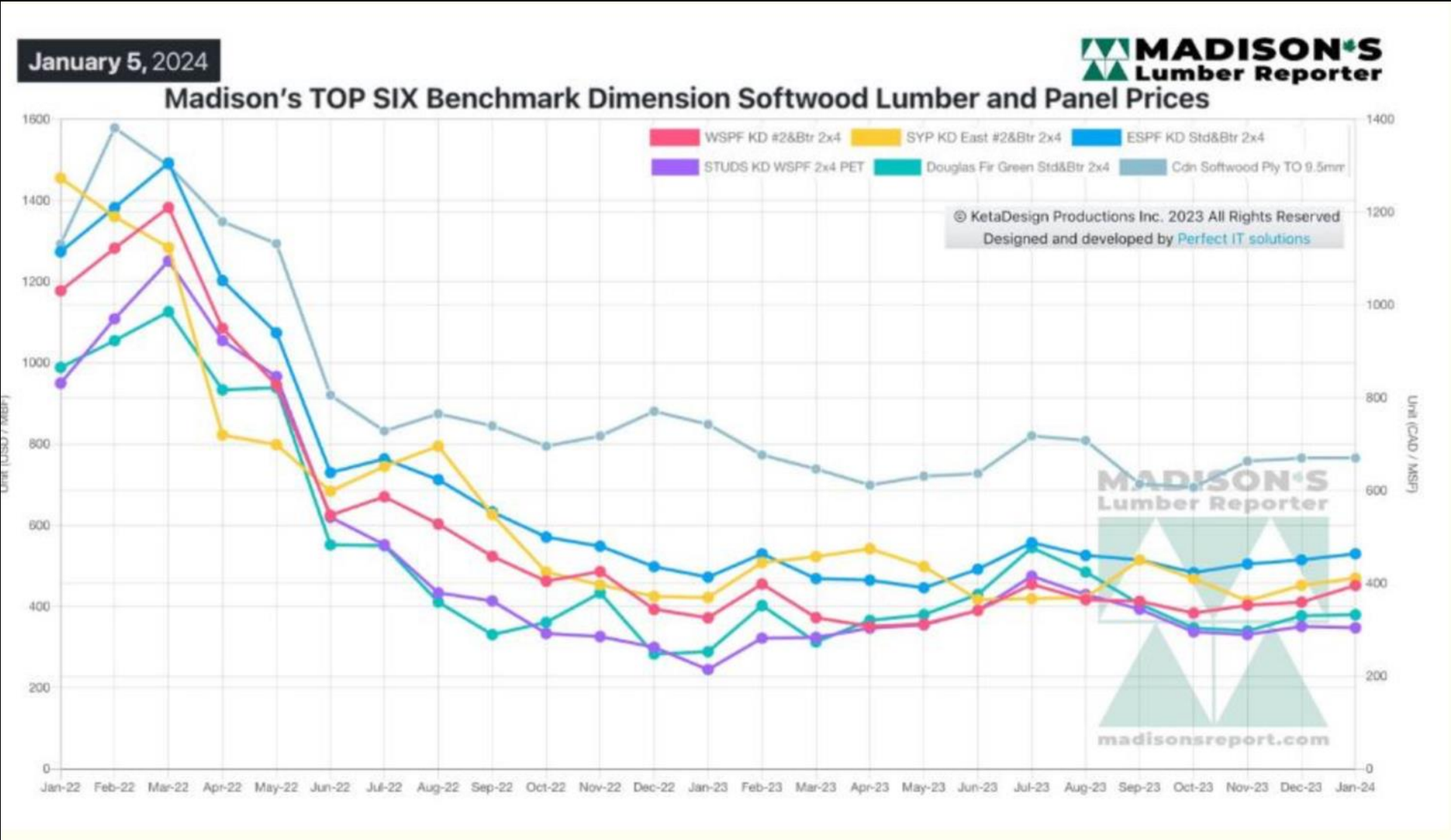
Softwood Lumber Markets

- In the past we saw a 1.5 year up and down cycle – now we are seeing longer term demand in USA.
- Just two years ago (2022) we saw:
 - Not enough material to meet ongoing high demand – What does this mean?
 - Escalator clauses built into the contract, which are passed onto the home buyer.

2022



Today



Source: 2024, Madison's Lumber Reporter

Softwood Lumber Markets

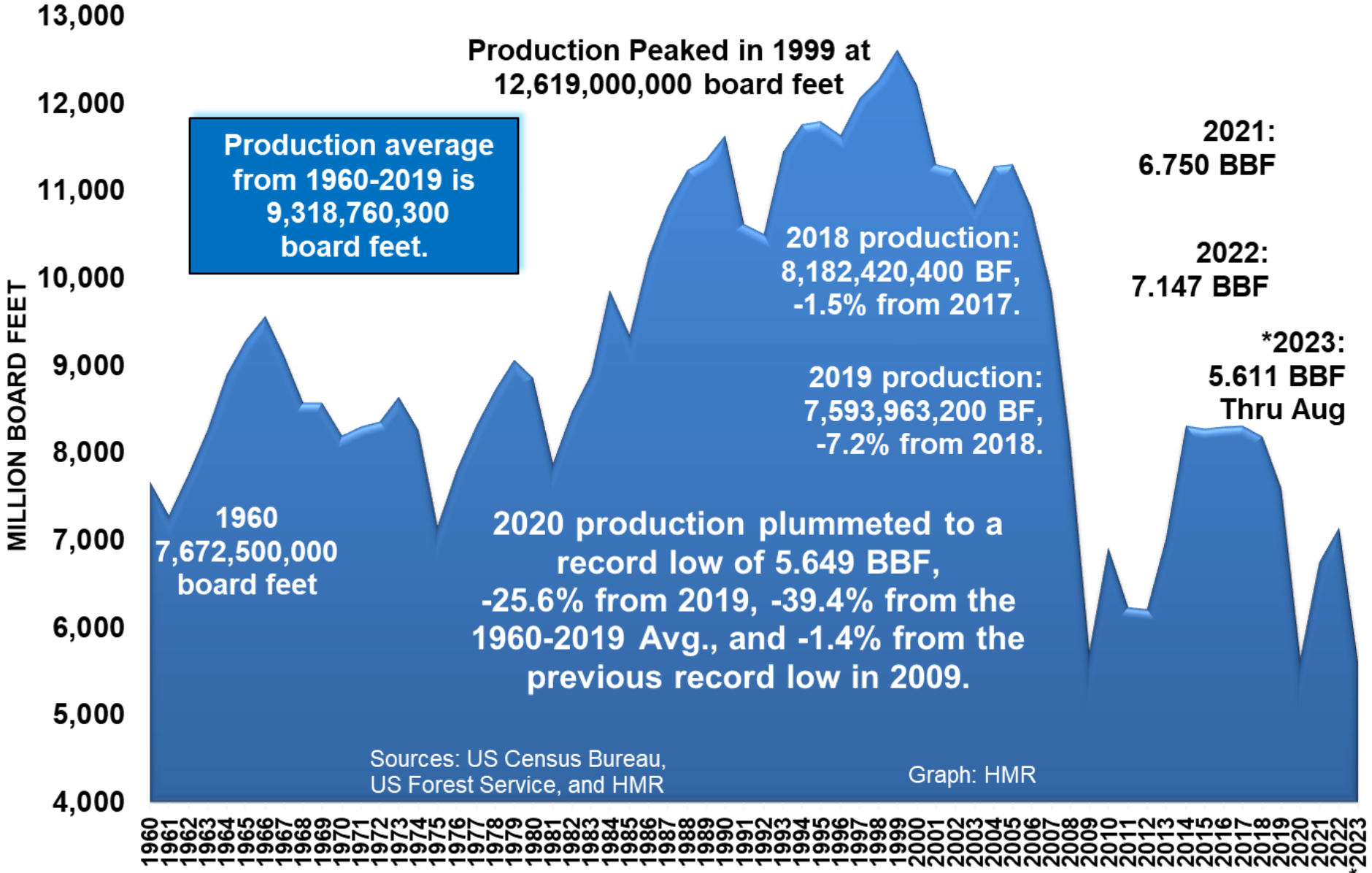
- What did I tell you in 2022?
 - “We will never see \$400 2x4s studs again. A good guess is between \$600 and \$800 when things normalize.”
- 15 years of first-time home buyers are piling up.
- USA has been underbuilt since housing crash of 2008. Need ~2 million housing starts per year to make up for deficit.
- Impacts of non-transitory inflation on our economy.

Pulpwood in Wisconsin

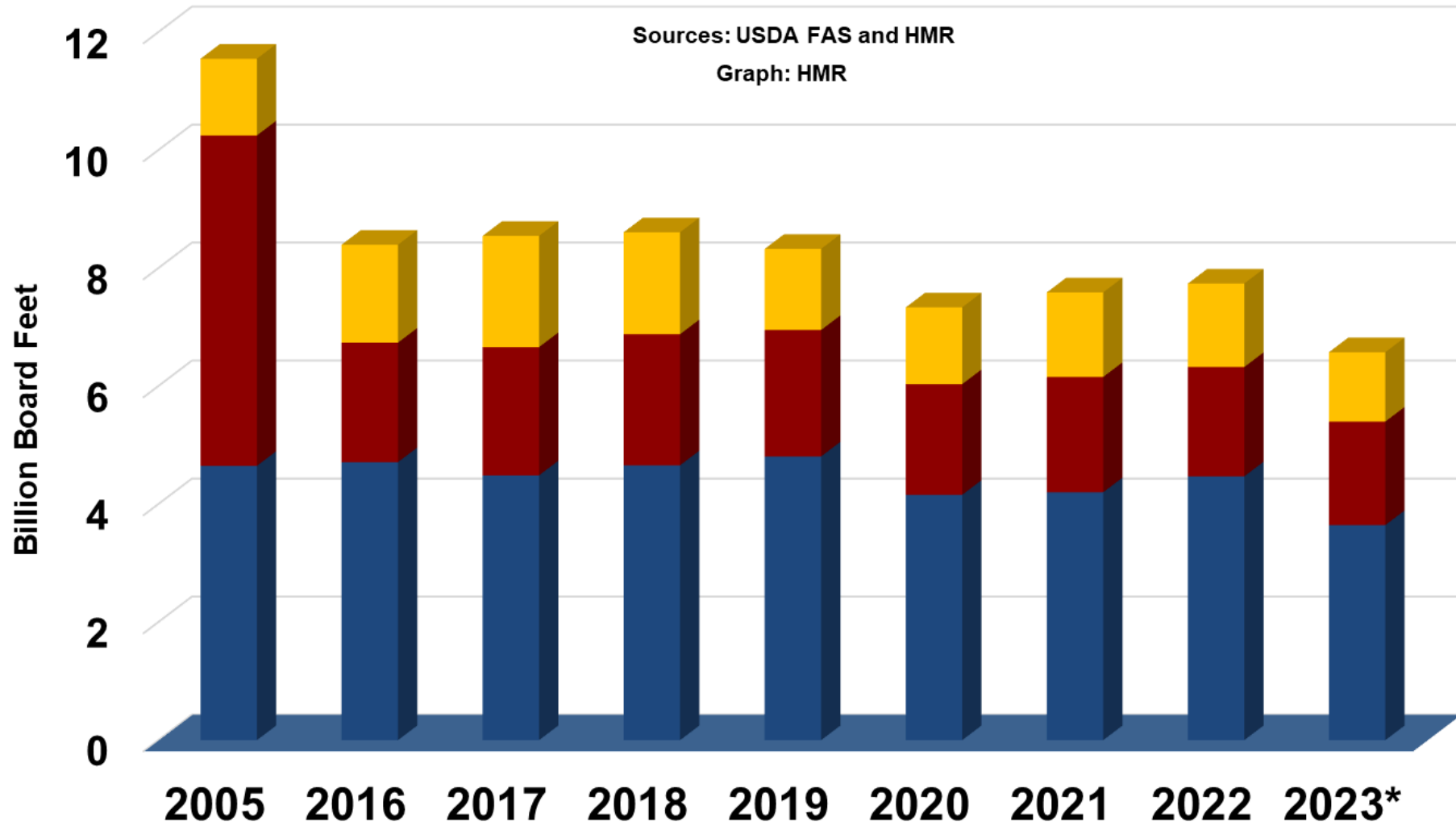
- Is there a future for Wisconsin specialty engineered products?
- They don't compete with the big sawmills in USA and Canada.
- They would provide markets for Wisconsin pulpwood.

Hardwood Lumber Markets

Eastern US Hardwood Sawmill Production

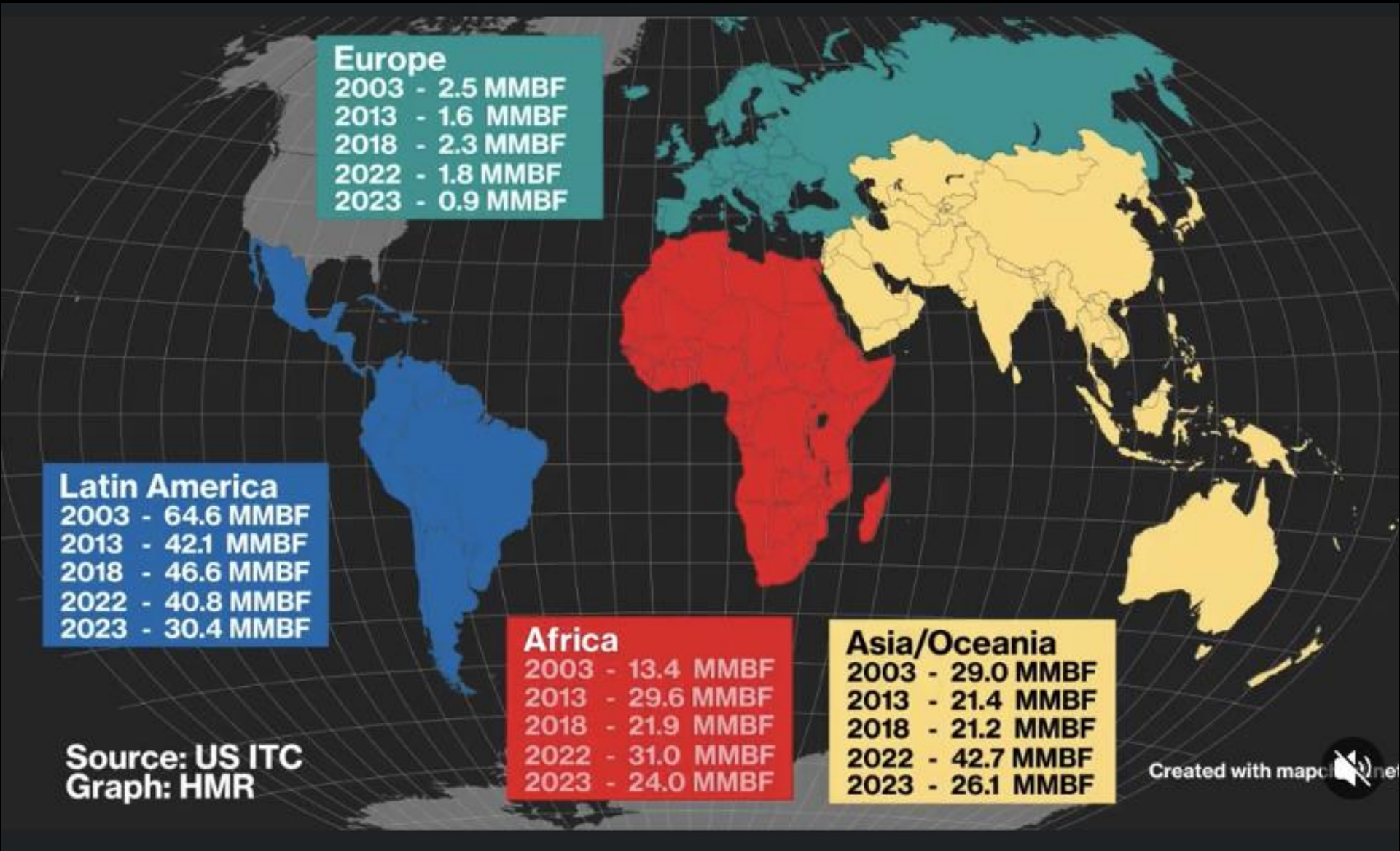


Hardwood Consumption by US Industrial and Grade Lumber Markets



■ Industrial lumber ■ Grade lumber - Domestic ■ Grade lumber - Export

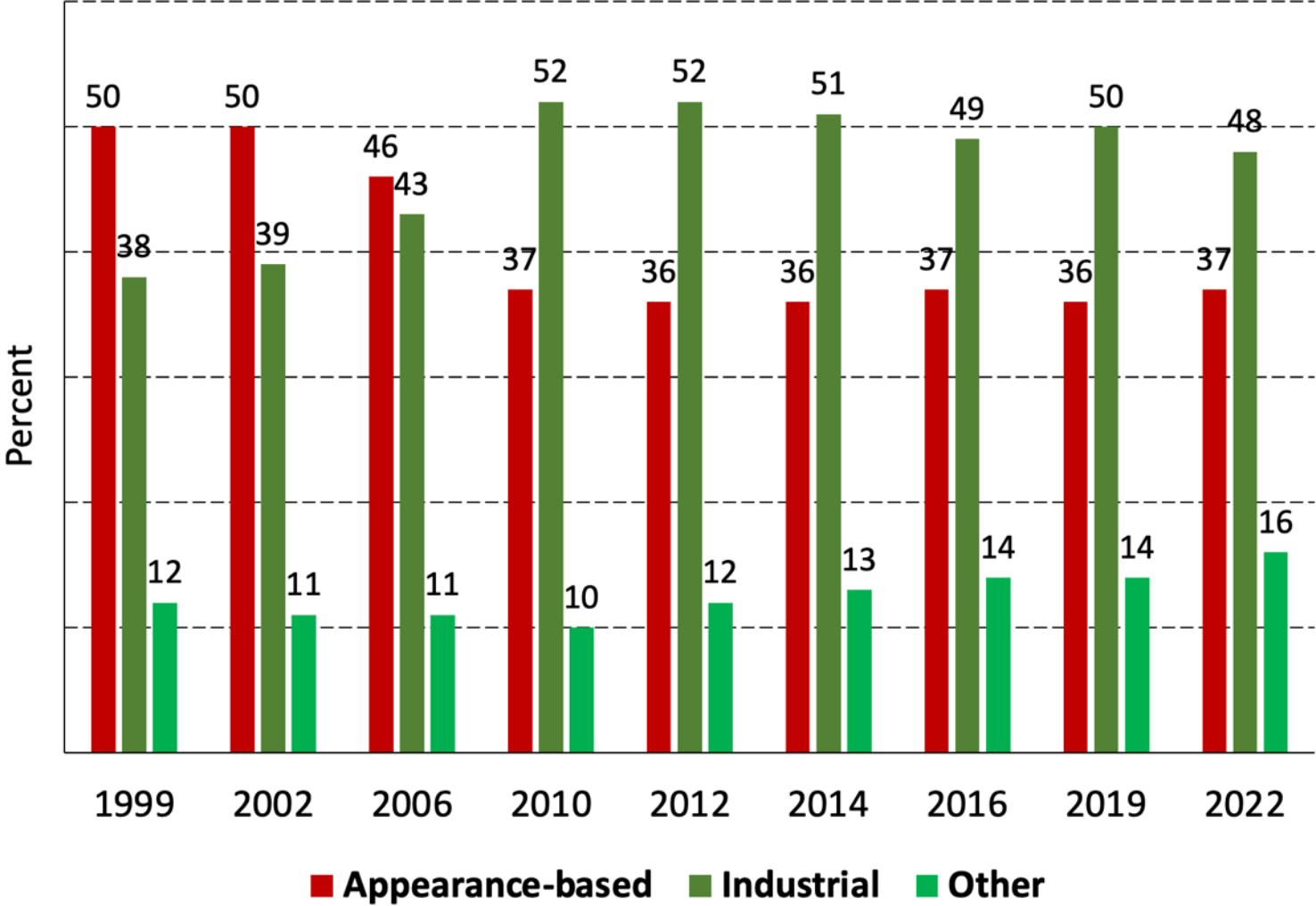




Source: US ITC
Graph: HMR

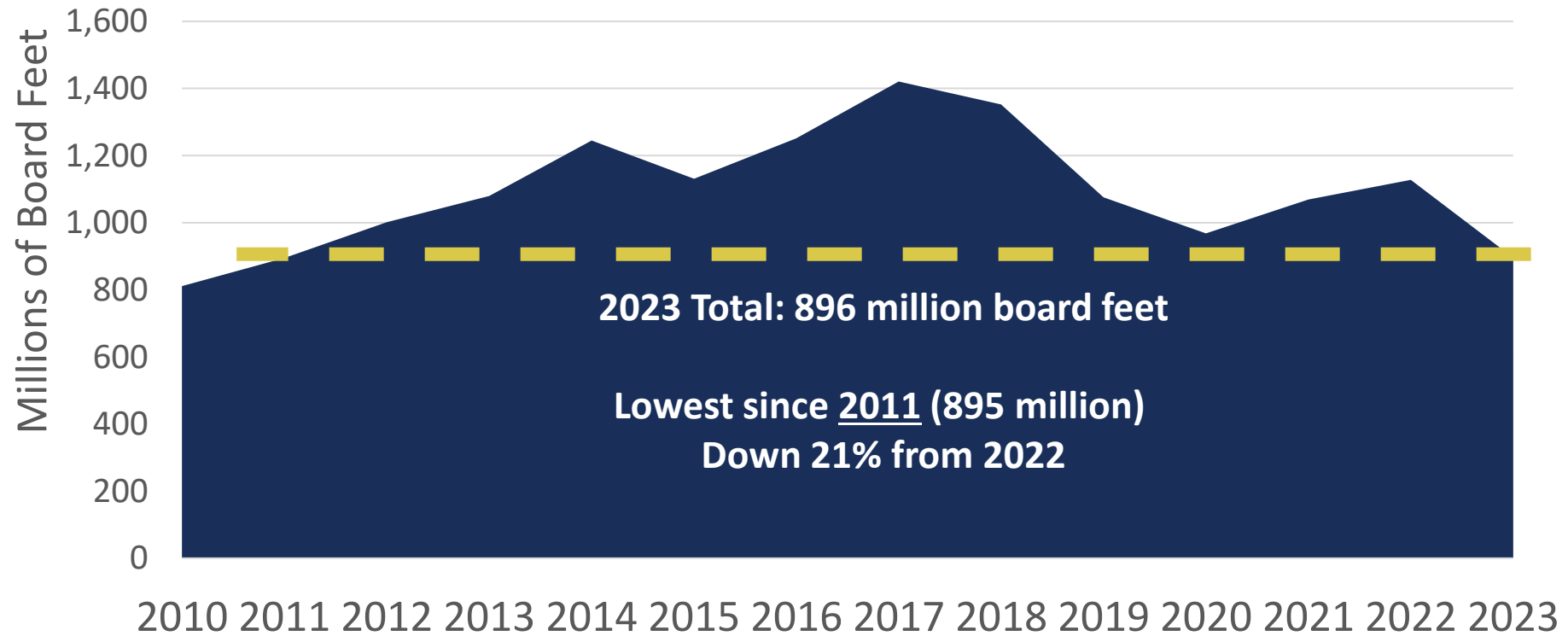
Created with mapchart.net

U.S. hardwood lumber consumption by market segment*



* Exports excluded

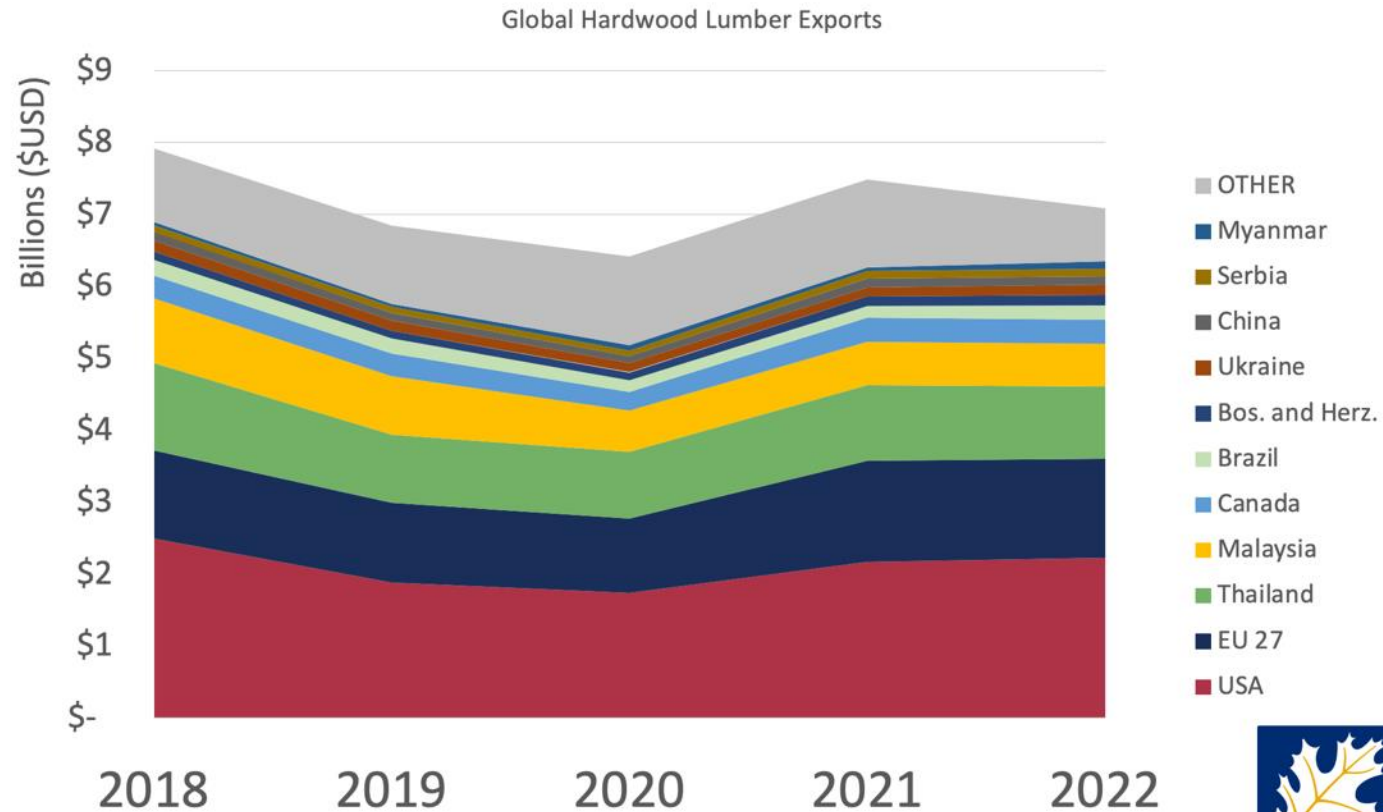
US Lumber Exports, Jan-Sept Totals



Source: USDA GATS, all years Jan-Sept Data



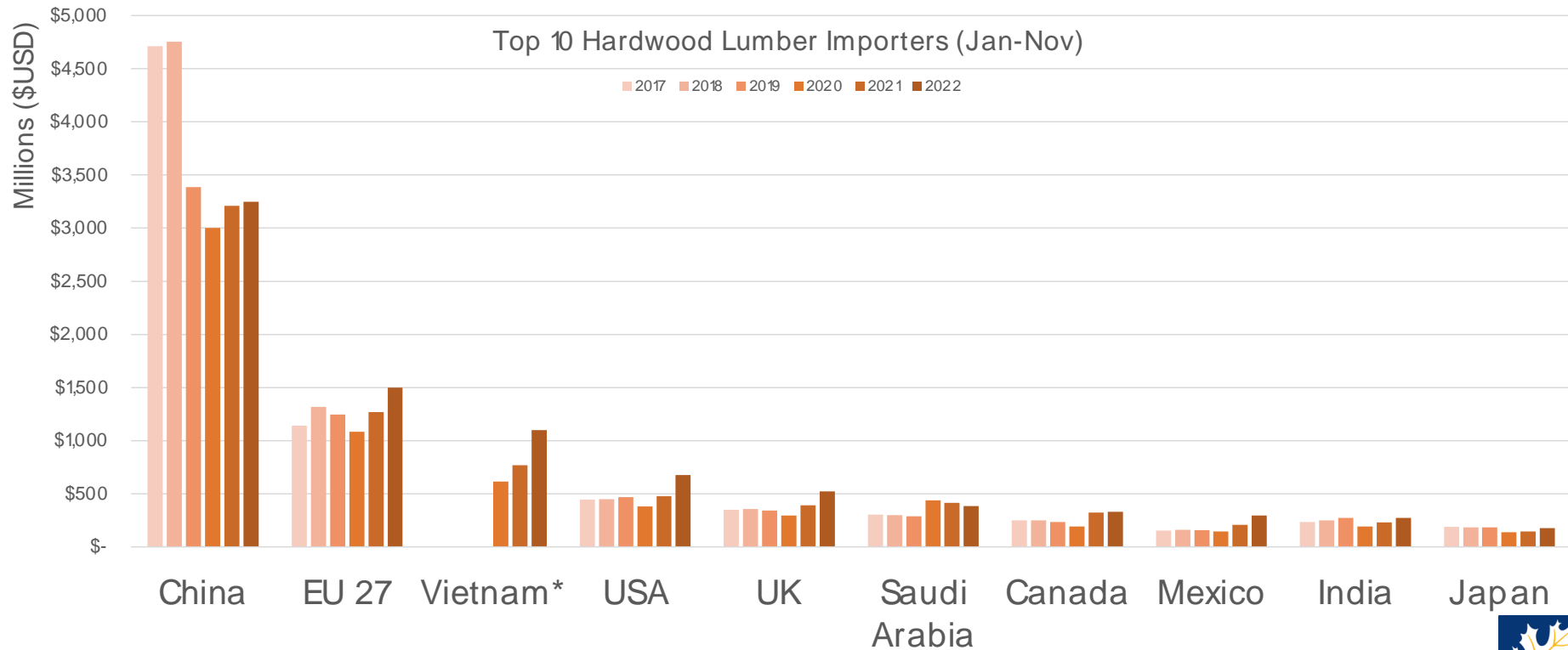
USA Still World's Largest Hardwood Lumber Exporter



Source: Global Trade Atlas



China Still World's Largest Harwood Lumber Importer



Source: USDA GATS



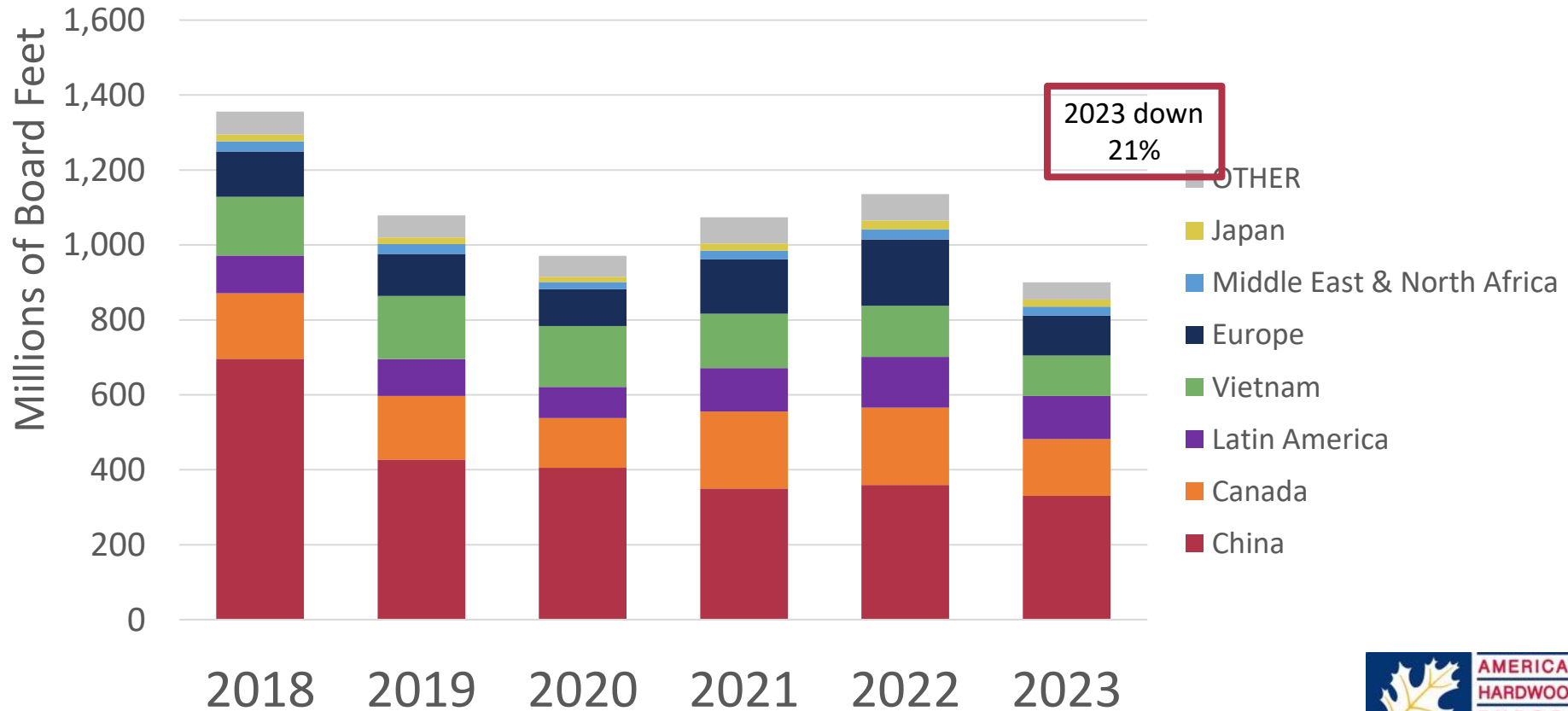
2023 US Lumber Exports Jan-Sept Volume in Board Feet



Source: USDA GATS, all years Jan-Sept Data



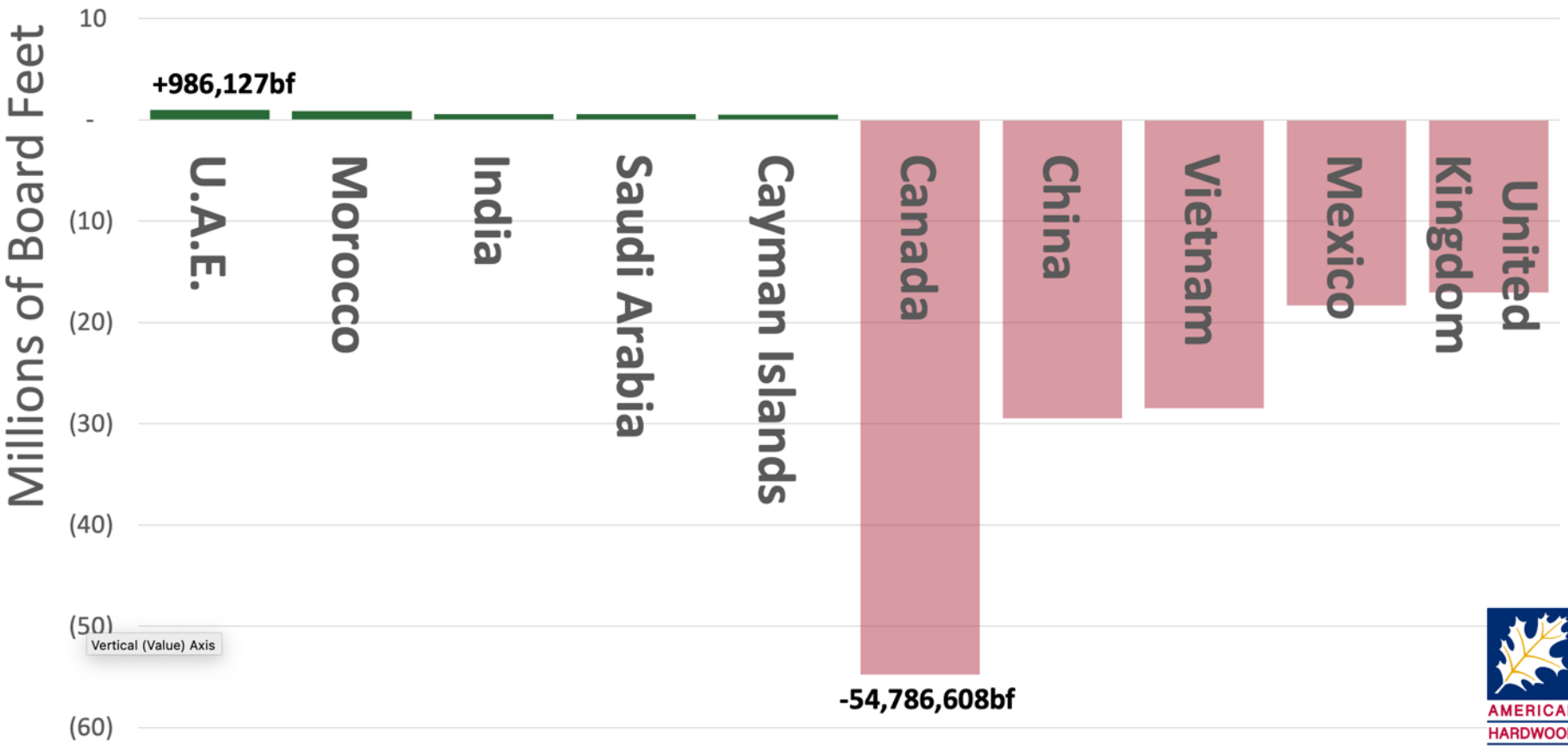
Lumber Exports by Market (3Q in Board Feet)



Source: USDA GATS, all years Jan-Sept Data



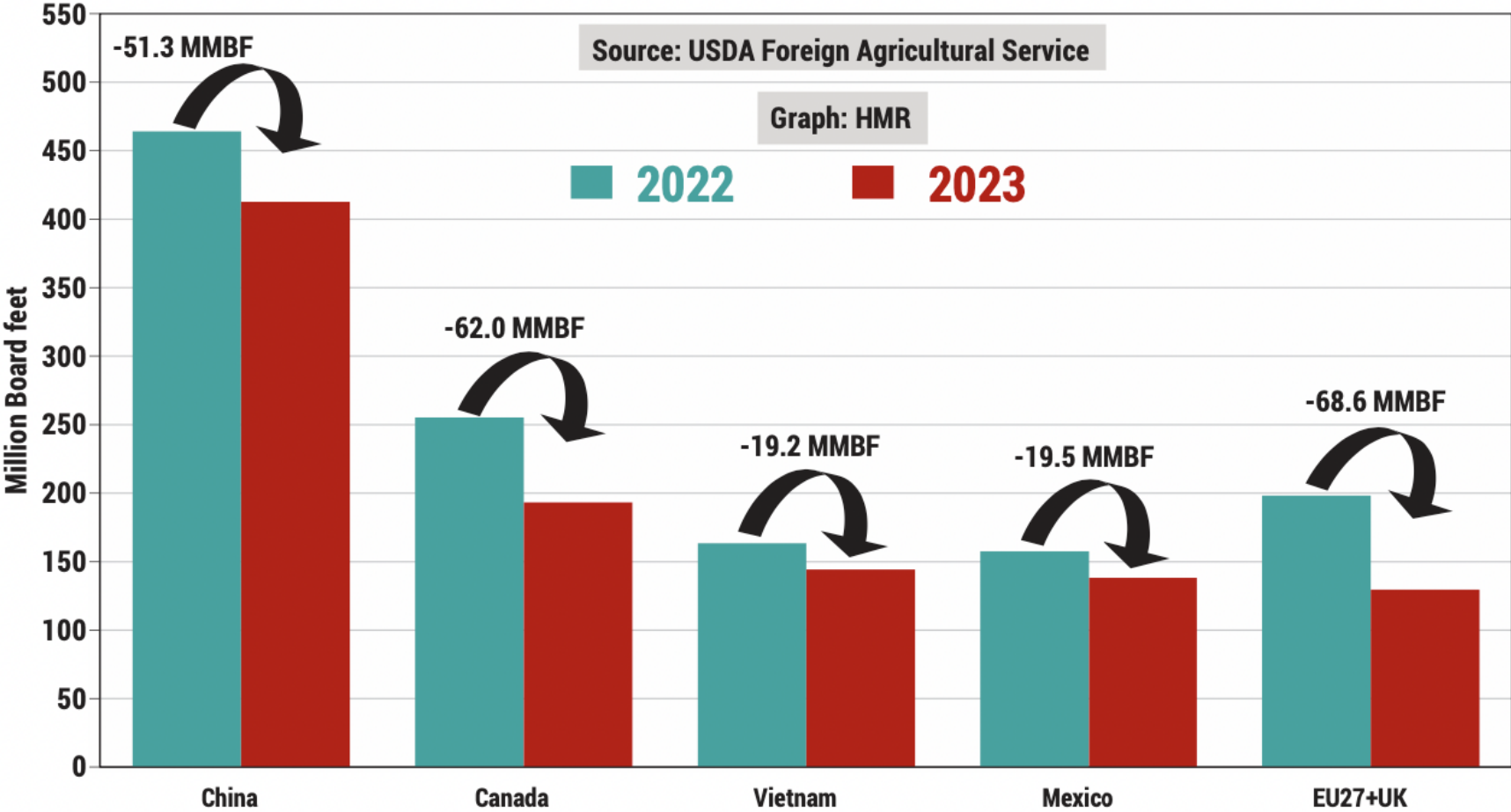
Largest Volume Changes 2023-2022



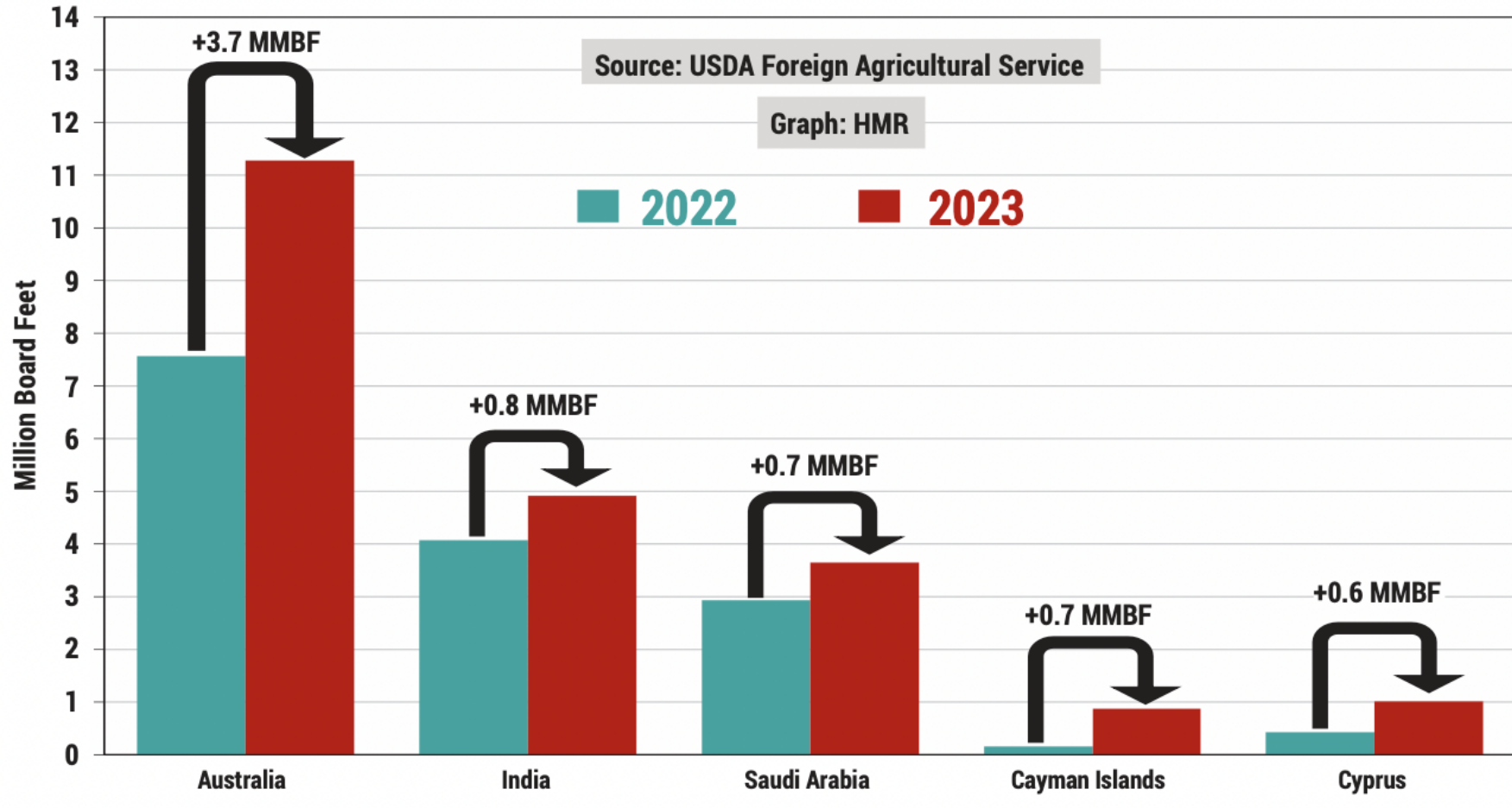
Source: USDA GATS, all years Jan-Sept Data



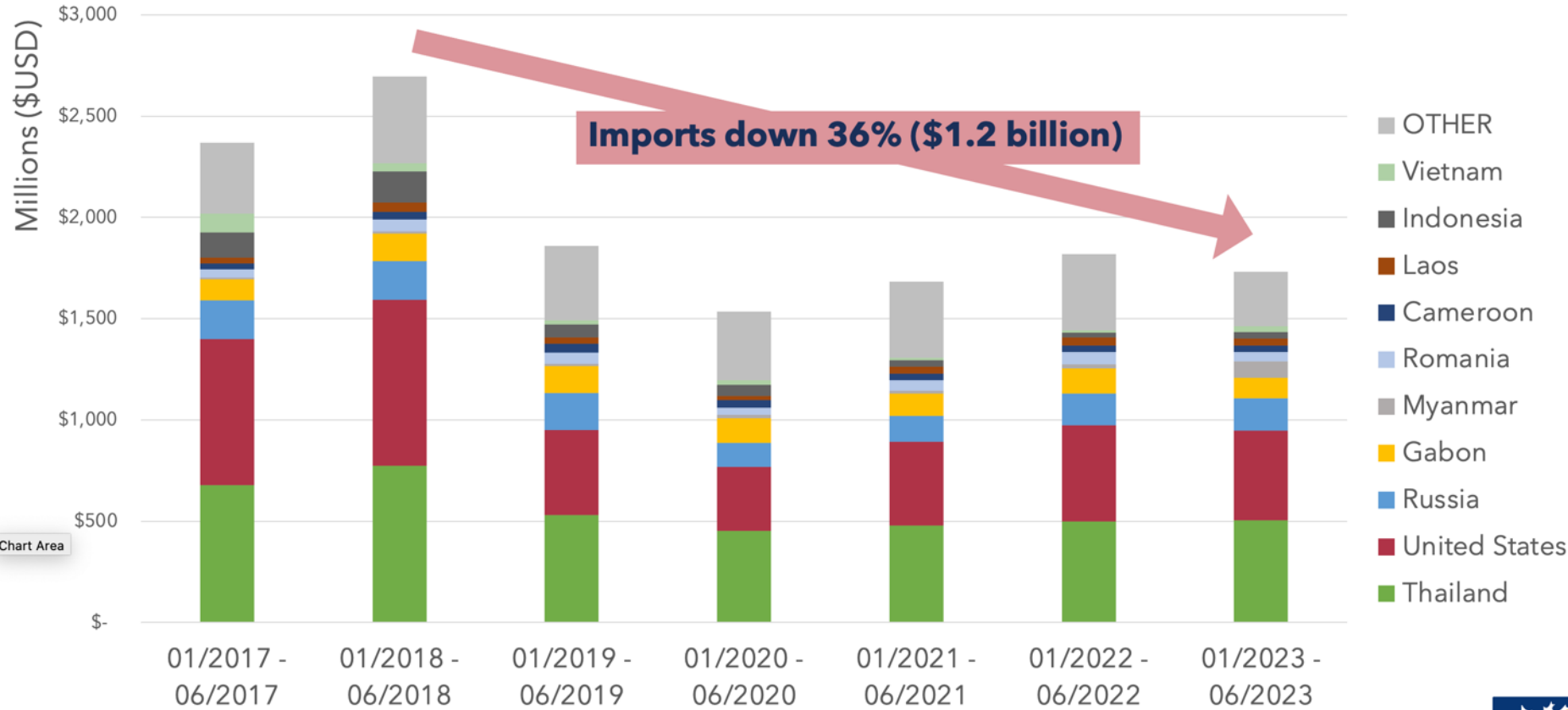
US Exports of Hardwood Lumber to Major Markets 2023 vs. 2022



Largest Increases in US Exports of Hardwood Lumber by Individual Market, 2023 vs. 2022



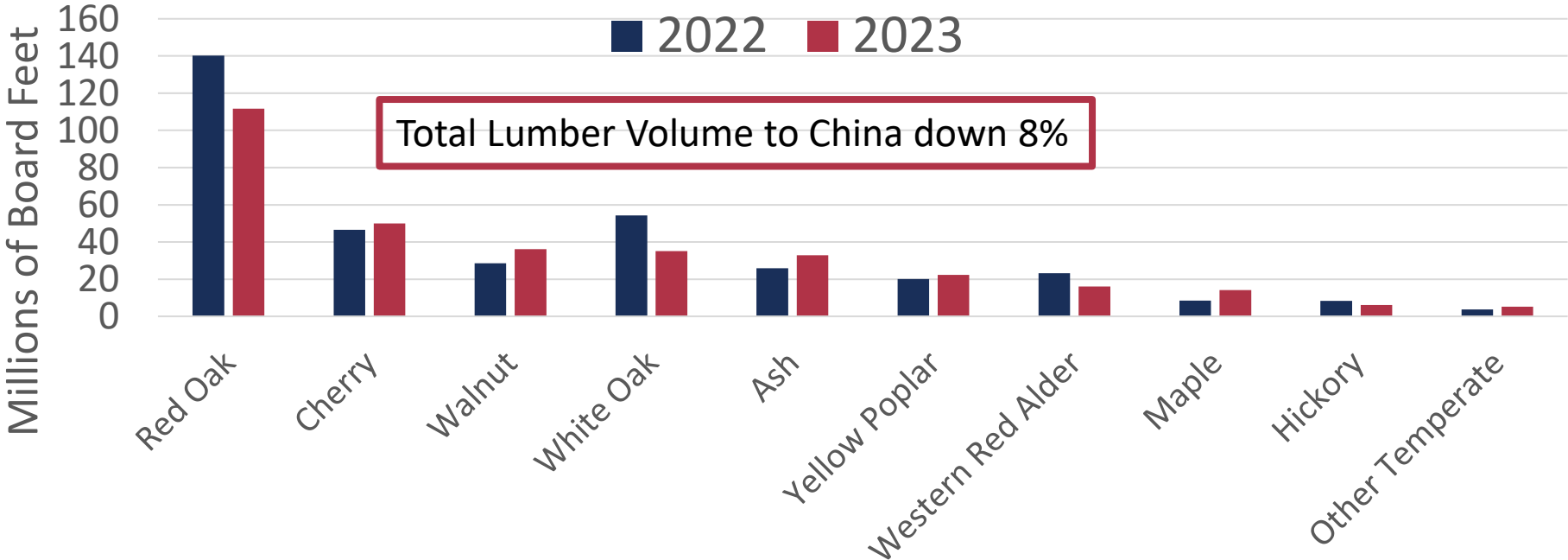
China Lumber Imports from All Countries (Jan-June each year)



Source: Global Trade Atlas



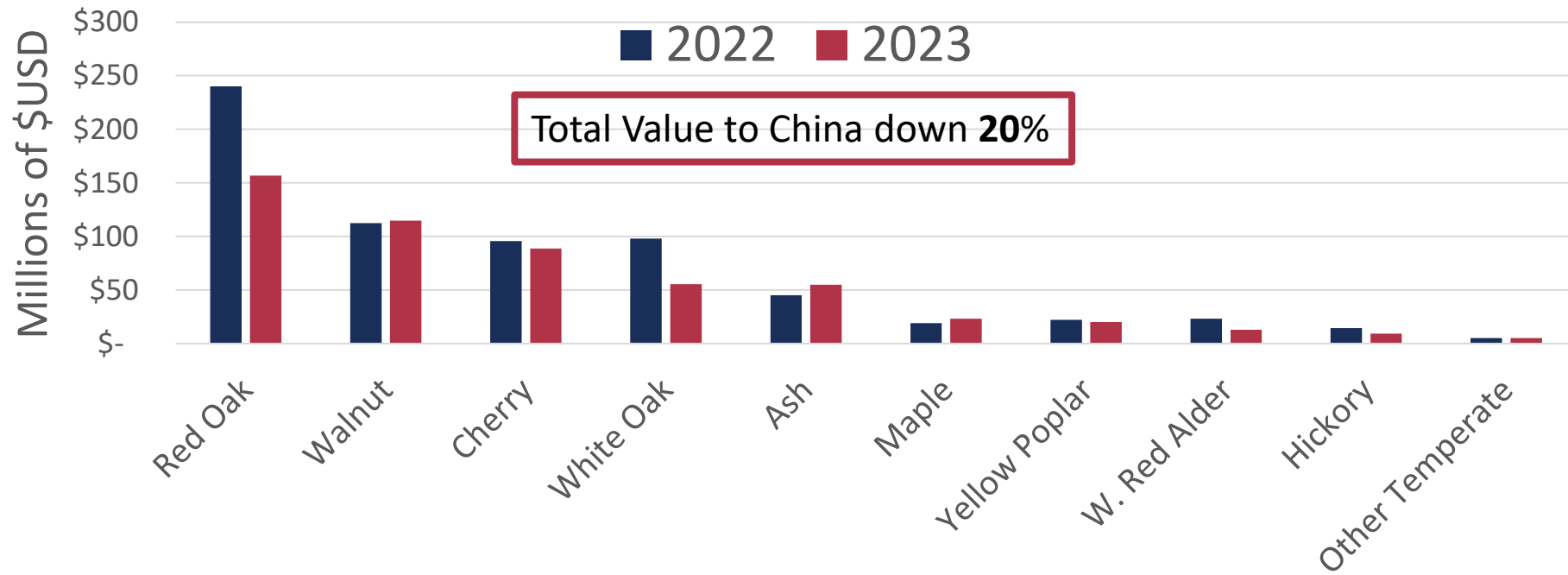
US Lumber to China, 2022 vs 2023 Jan-Sept, Volume in Board Feet



Source: USDA GATS, all years Jan-Sept Data



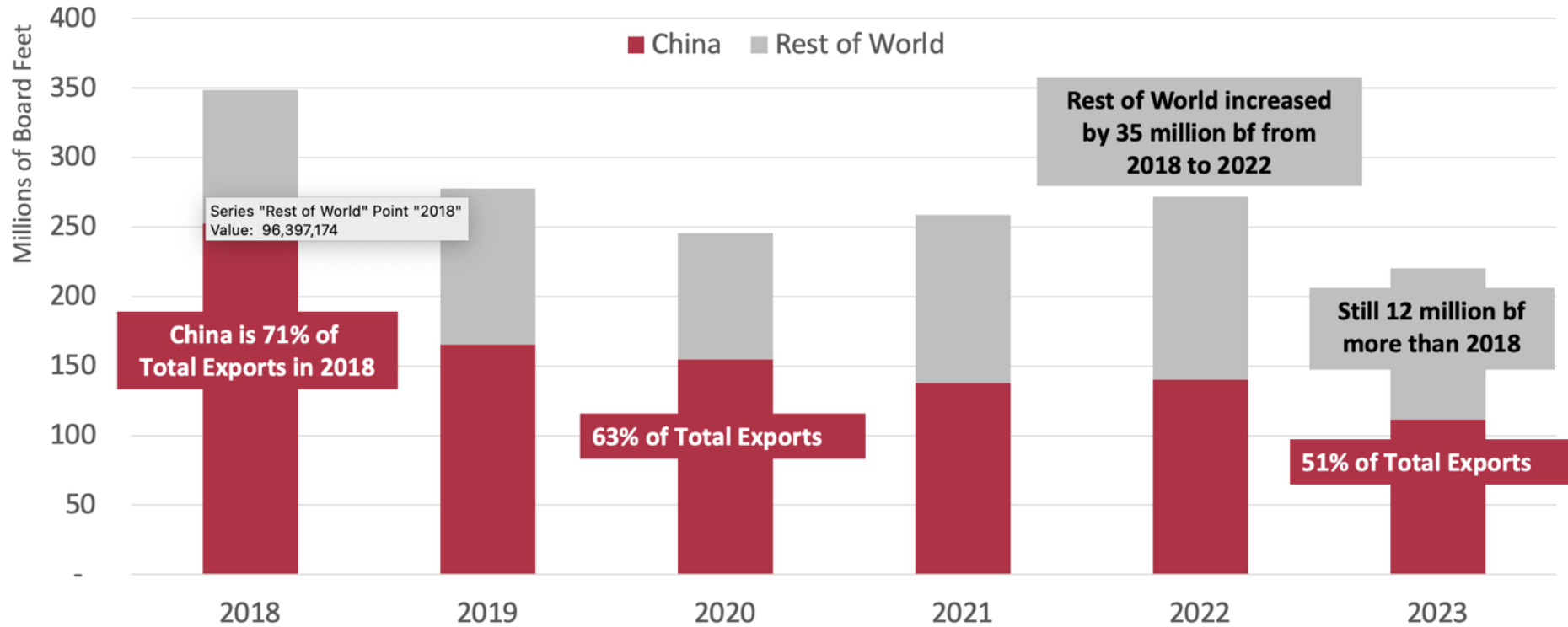
US Lumber to China, 2022 vs 2023 Jan-Sept, Value in \$USD



Source: USDA GATS, all years Jan-Sept Data



Red Oak Lumber Exports to China and Rest of World (Jan-Sept each year)



Source: USDA GATS, all years Jan-Sept Data





China at a Crossroads:

- Growth slowing
- Geopolitics over economics
- Return of the “zombie” SOE
- Housing Market in Crisis
- Increasing debt
- Demographic “timebomb”
- Nearshoring/”friendshoring”

China's economy

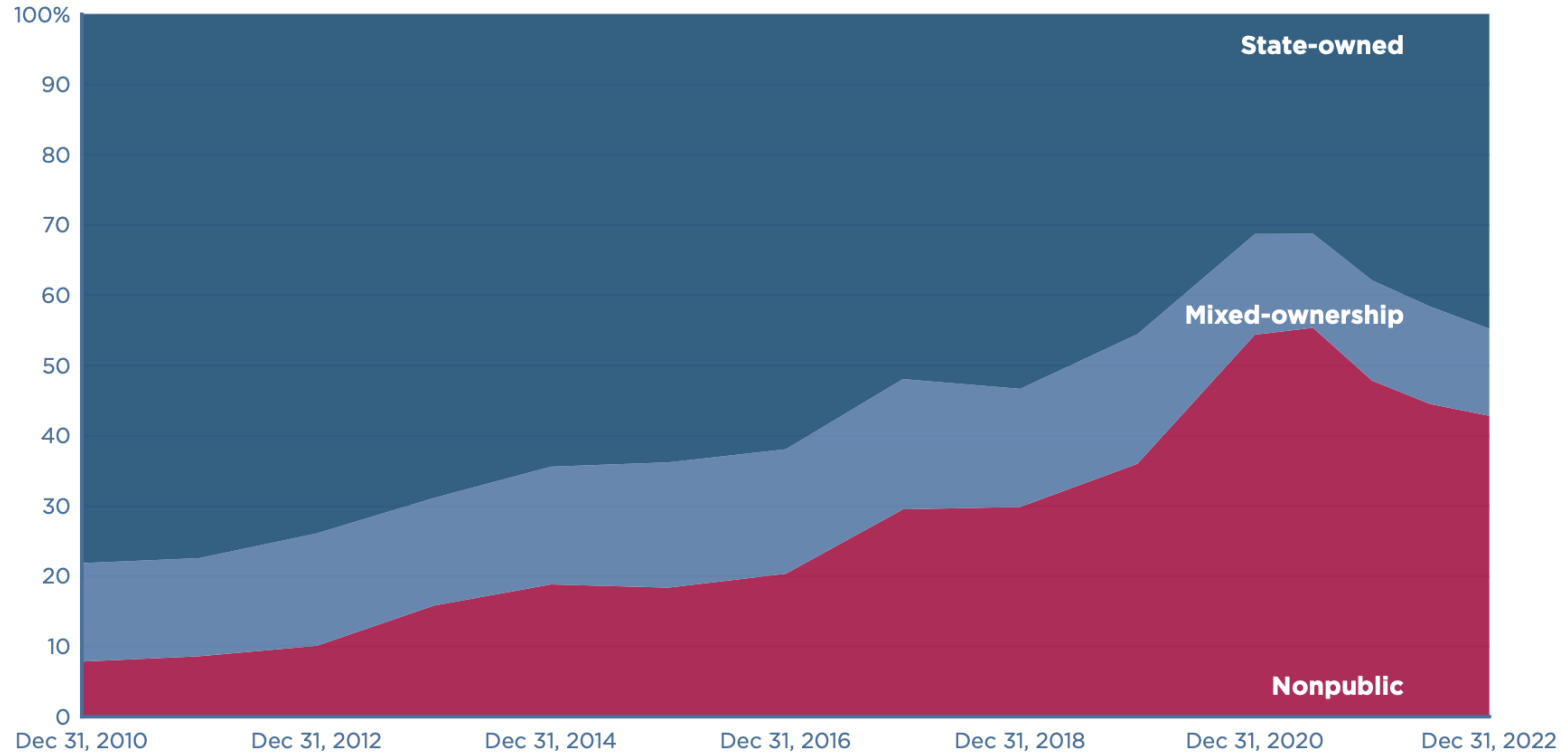
Ideology versus prosperity

How Xi Jinping is damaging China's economy



The private sector has continued to decline as a share of China's largest listed companies since June 2021

Share of aggregate market capitalization of China's top 100 listed firms, by ownership, end-2010 to end-2022



Notes: End-year data from 2010 to 2020; half-yearly from 2021. China's top 100 listed firms are defined as the 100 mainland Chinese firms with the largest market capitalizations, whether listed in the mainland or abroad, including so-called variable-interest

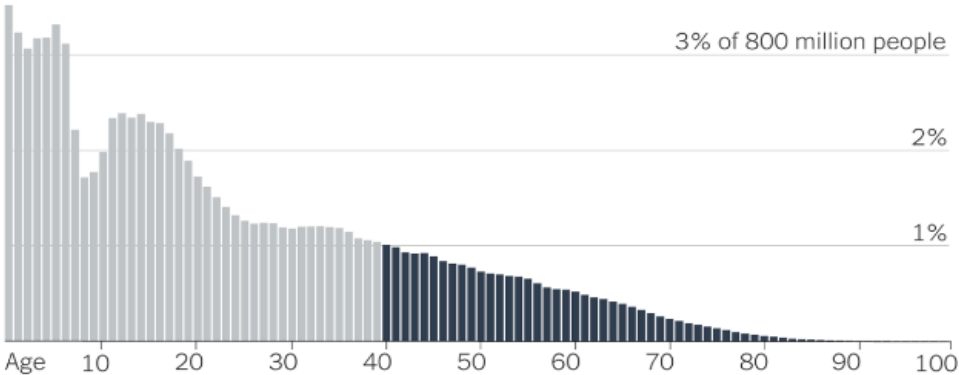


Oxford Economics estimated at the end of 2022 that Chinese housing demand was **8 million** units per year from 2010 through 2019 but would drop to only **4.6 million** per year from next year through 2030.

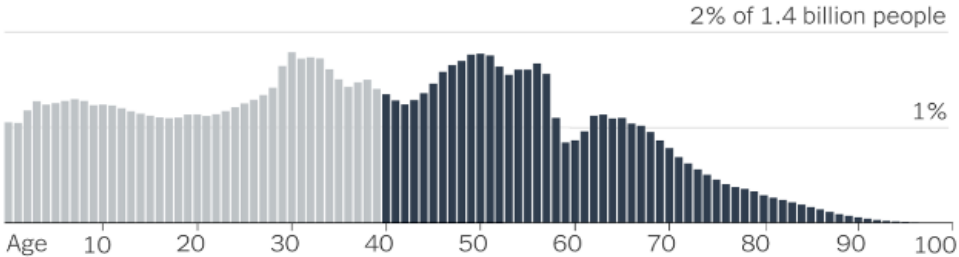
People have moved to the cities, birth rates are falling, and housing speculation has cooled

China's Population by Age

In 1970, 80% of China's population was younger than 40, and half of the country was under 20.



In 2021, half of the country was 40 or older, as China's distribution shifted to more closely resemble other developed nations.

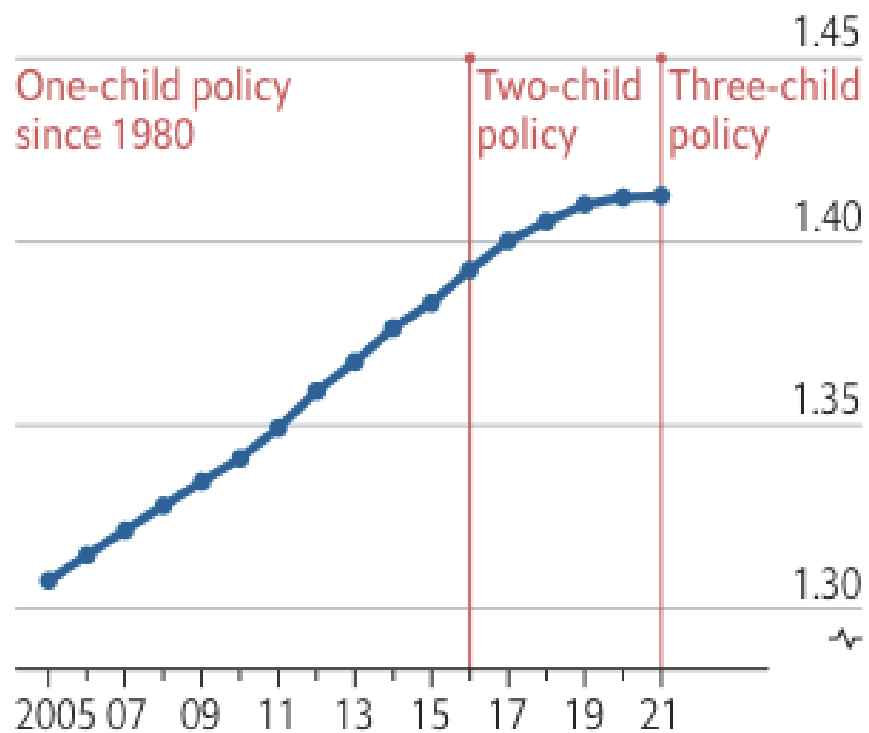


Source: United Nations Population Division (2022)

Ready for the dip

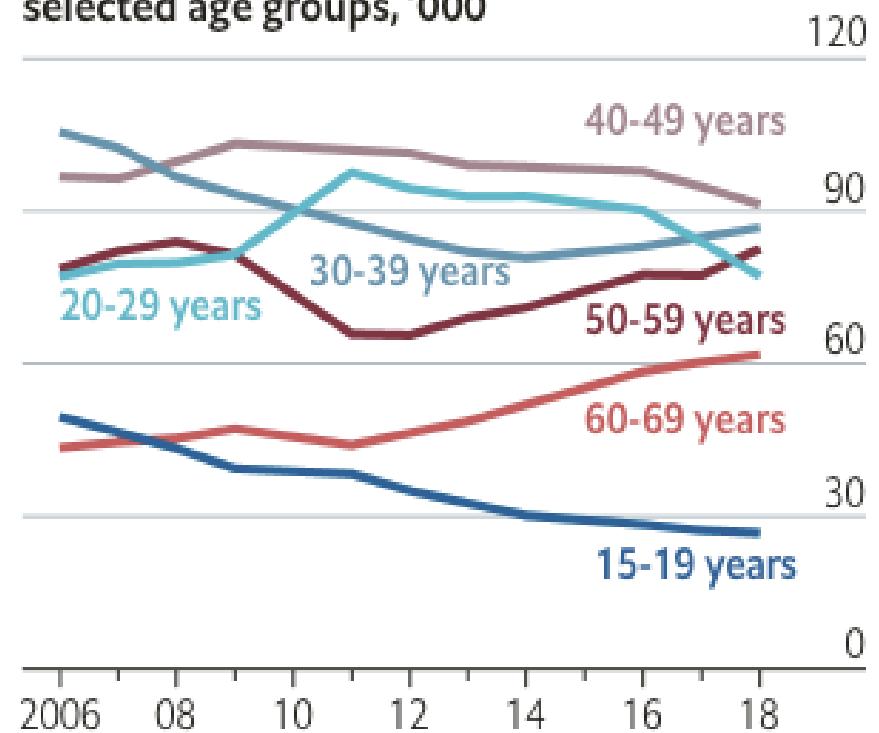
China

Population, bn



Source: National Bureau of Statistics of China

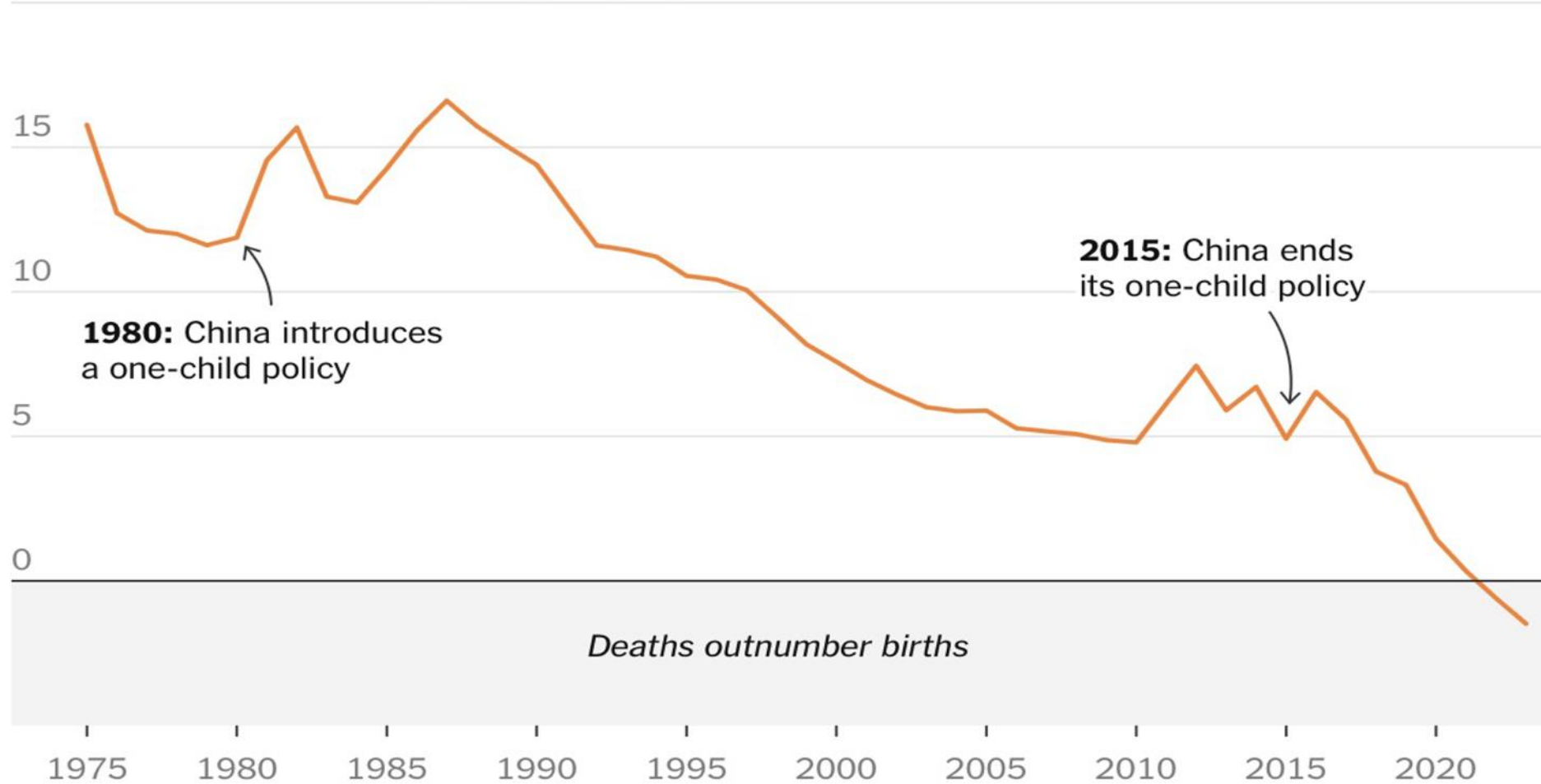
Sample of female population*, selected age groups, '000



*Sample of 0.5-2% of the population

China's population continues to shrink as deaths outnumber births

20 more births than deaths, per 1,000 people



1980: China introduces a one-child policy

2015: China ends its one-child policy

Deaths outnumber births

Note: In 2015, China announced that all married couples would be allowed to have two children. In 2021, China said it would allow couples to have three children. • Source: National Bureau of Statistics • By The New York Times

Nearshoring and “Friendshoring”

Moving supply chains to “friendly countries” to limit operations risk

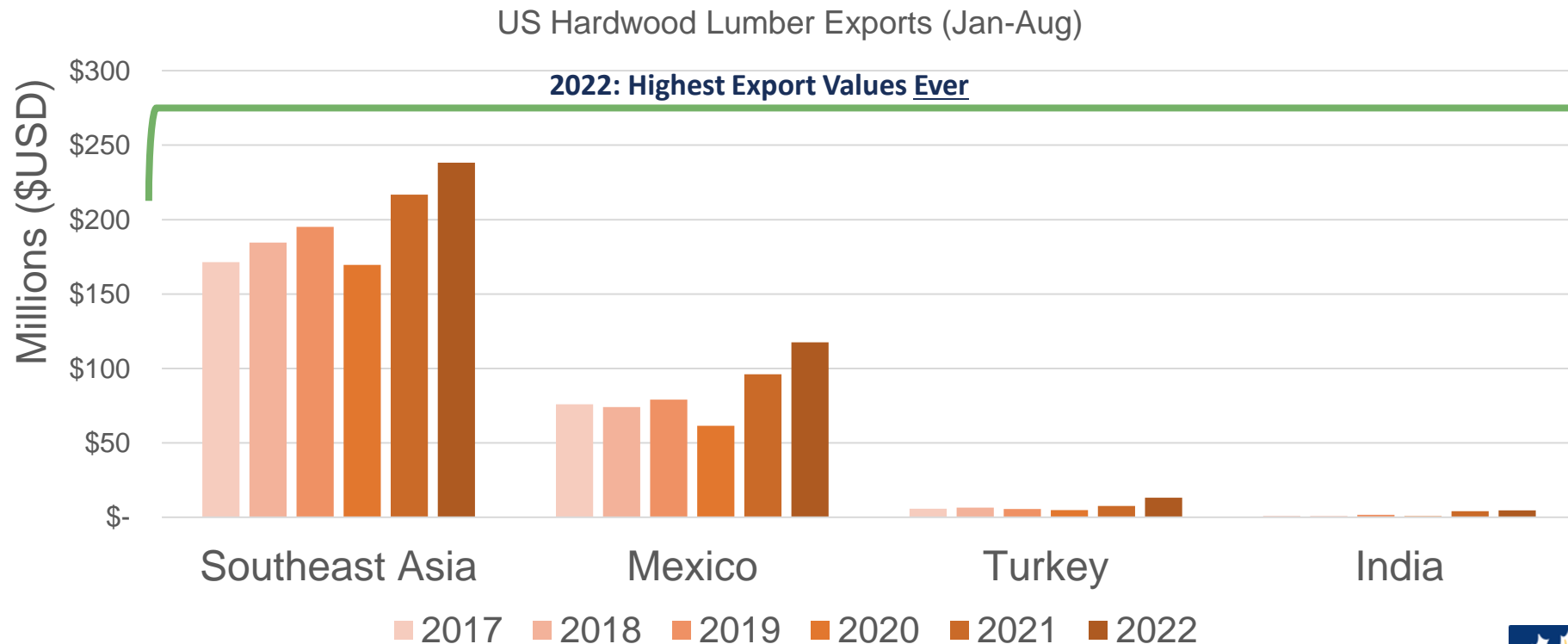
Fueled by logistics, Gov policy, overreliance on one market

- Apple
 - China -> Vietnam
- Samsung
 - China -> Vietnam
- Hasbro
 - China -> India and Vietnam
- Volvo
 - New EV factory in Slovakia for EU market



Beneficiaries of “Nearshoring”

- SE Asia and India for Asian Manufacturing
- Mexico for N. America
- Turkey for Europe



Source: USDA GATS, data for Jan-Aug each year



Chequed and unchequed growth

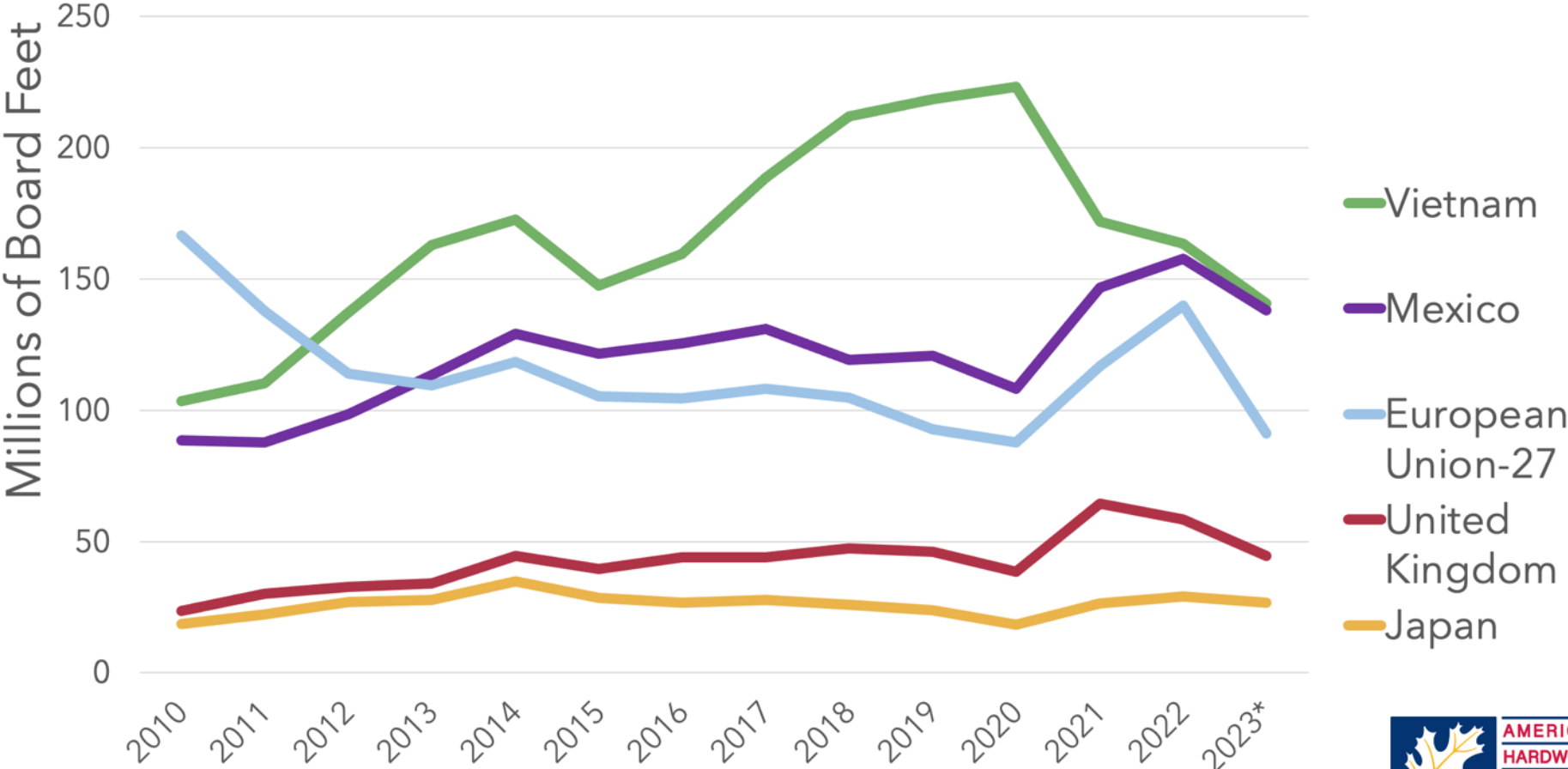
Manufacturing labour cost, \$ per hour



Source: Haver Analytics

Stop Talking about China

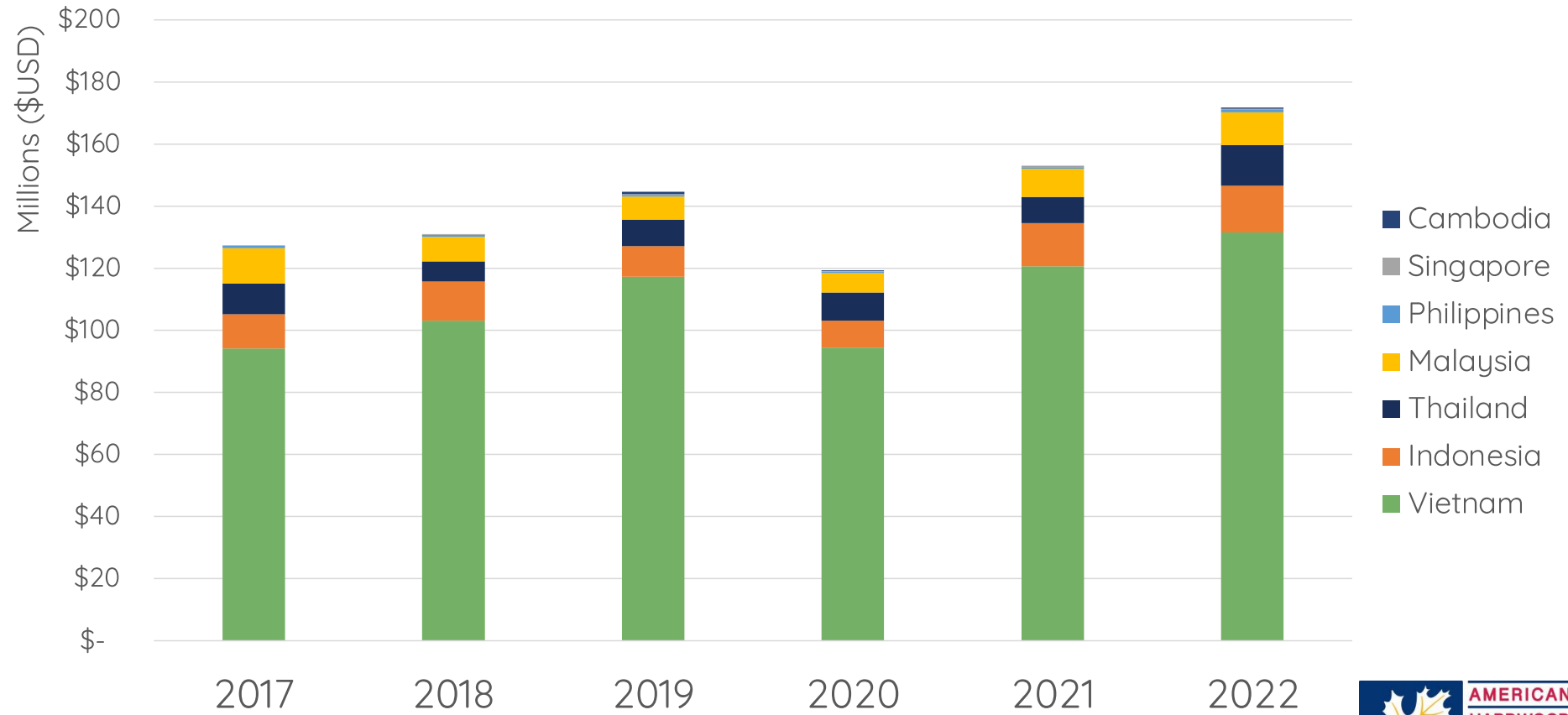
Exports to Major Markets Other than China & Canada



Source: USDA GATS, 2023 number annualized based on July data



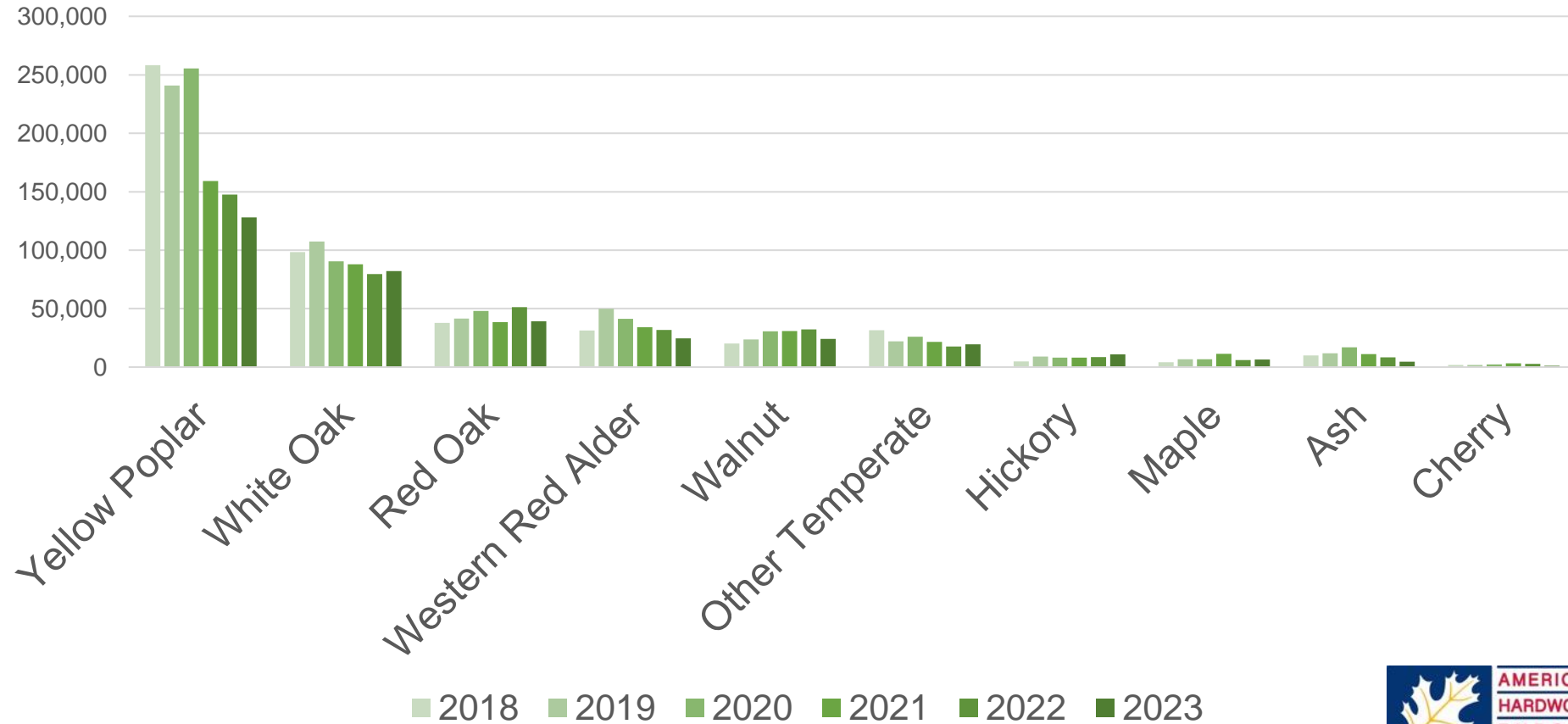
US Lumber to SE Asia



Source: USDA GATS, data for Jan-June each year



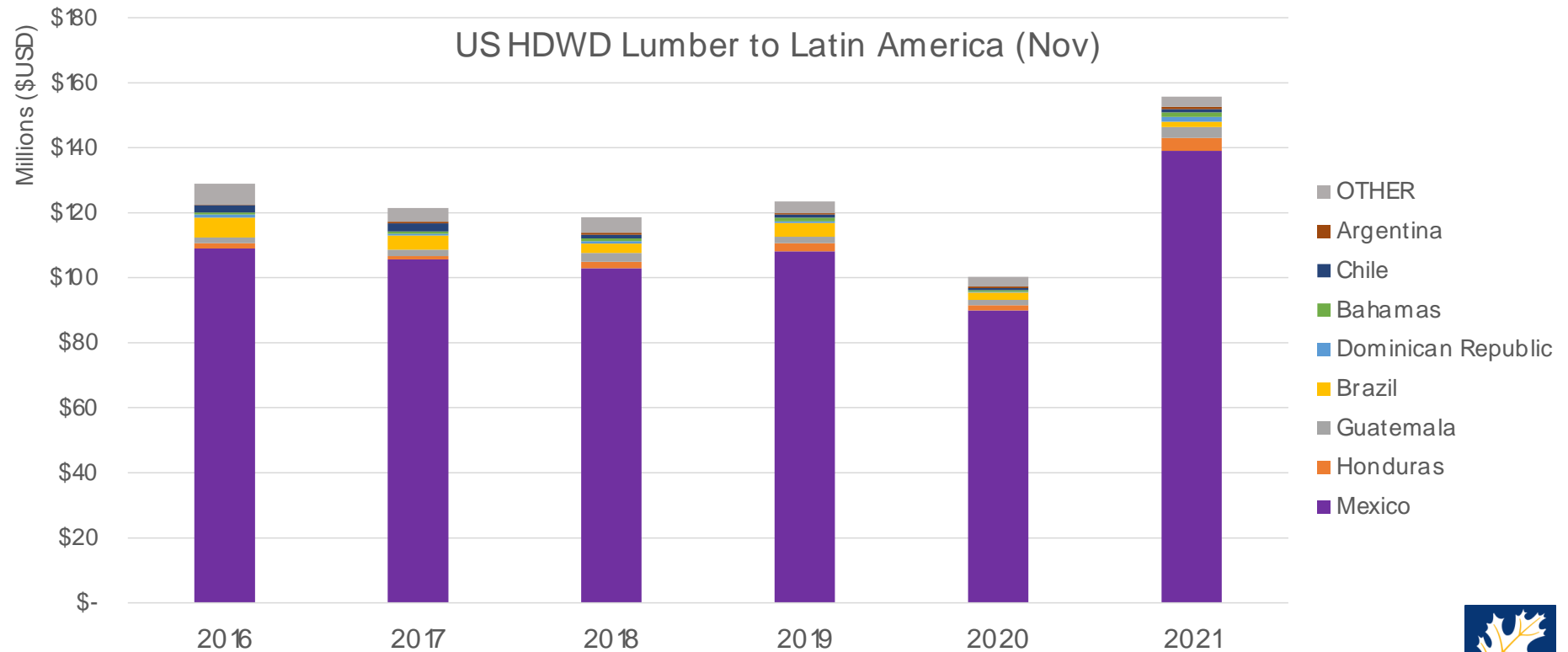
US Hardwood Lumber to Vietnam (m3)



Source: USDA GATS



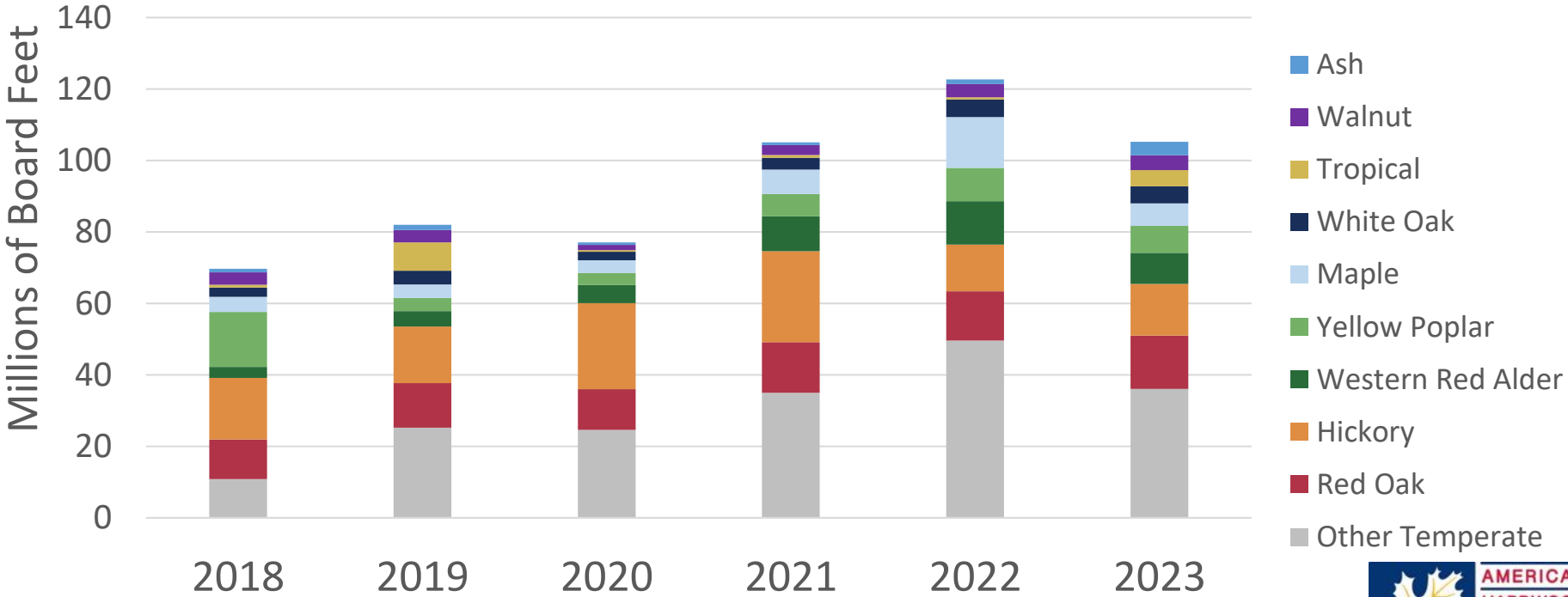
Mexico Dominates Latin America Trade



Source: USDA GATS (November)



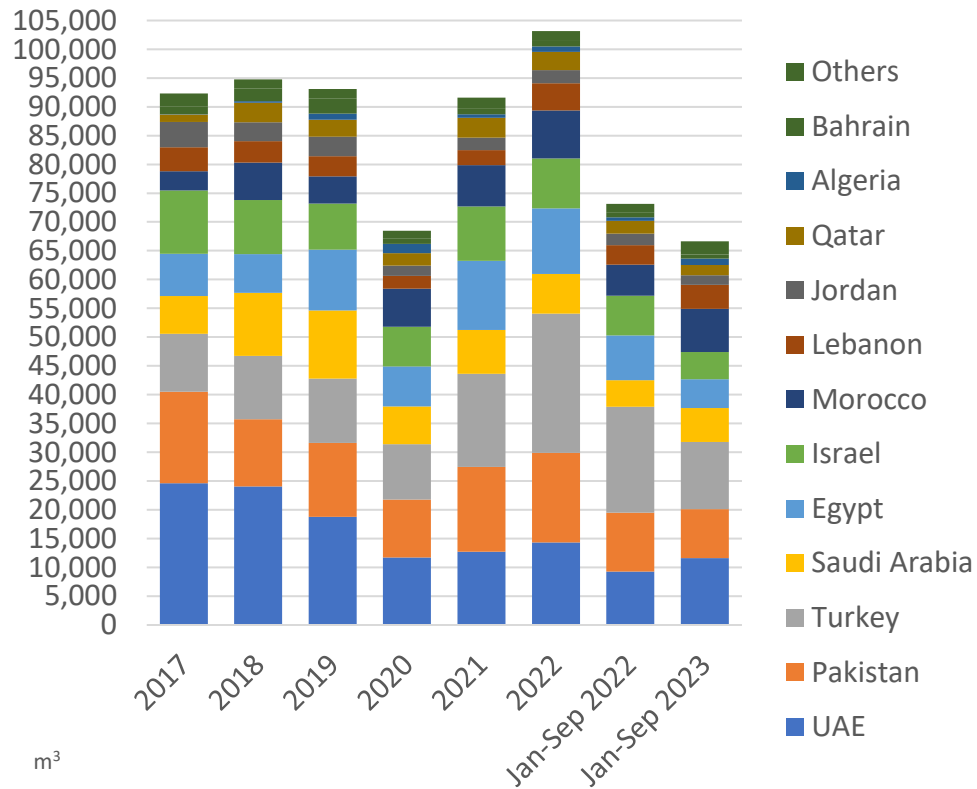
US Lumber to Mexico Volume BF



Source: USDA GATS, all years Jan-Sept Data



JAN-SEP 2023 U.S. HARDWOOD LUMBER EXPORTS (m³) – MENA & PAKISTAN



There was an 8% year-on-year decrease in the volume of shipments to the MENA region during the first nine months of 2023 to 58,110 cubic metres and an 11% decrease in value to USD 47.12 million.

At the same time, exports to Pakistan fell by 17% in volume and by 13% in value, owing to the on-going economic crisis the country is facing.

Shipments to the UAE, Saudi Arabia and Morocco were all up during the period, while exports to Egypt, Israel and Turkey were all down, due to economic uncertainty and, in the case of Egypt, another economic crisis.

As always, red oak dominated lumber shipments to the MENA region, accounting for over 55% of the total volume shipped during the period.

Source: USDA Foreign Agricultural Service





INDIA – HARDWOOD LUMBER END-USERS

The main hardwood lumber processing centres (furniture & handcraft manufacturers) are located in:

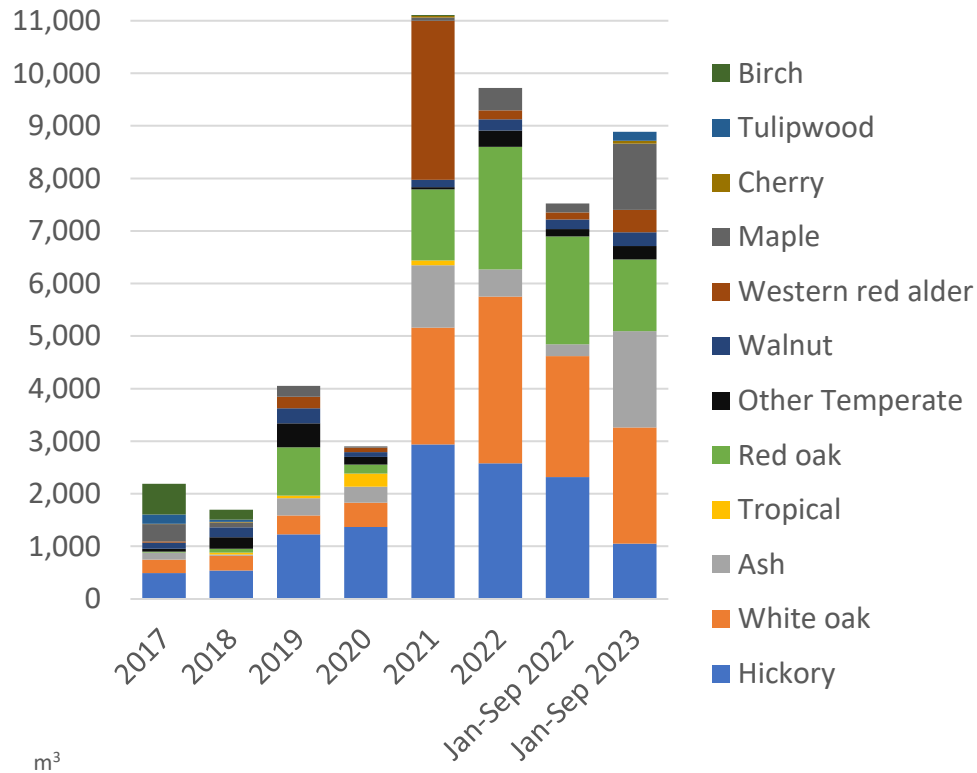
- Delhi-National Capital Region
- Jaipur & Jodhpur in Rajasthan
- Bengaluru (formerly Bangalore)
- Chennai (formerly Madras)

Manufacturers are located across the whole country, but other notable centres are:

- Mumbai & Pune
- Hyderabad
- Kolkata
- Ahmedabad (Ghandinagar)
- Lucknow
- Mysore (near Bengaluru)



JAN-SEP 2023 U.S. HARDWOOD LUMBER EXPORTS (m³) – INDIA



Source: USDA Foreign Agricultural Service

AMERICAN HARDWOOD EXPORT COUNCIL

An 18% year-on-year increase was seen in the volume of US hardwood lumber shipped to India during the first nine months of 2023, reaching 8,887 cubic metres.

2023 is on track to be a new record year for US hardwood lumber shipments to India.

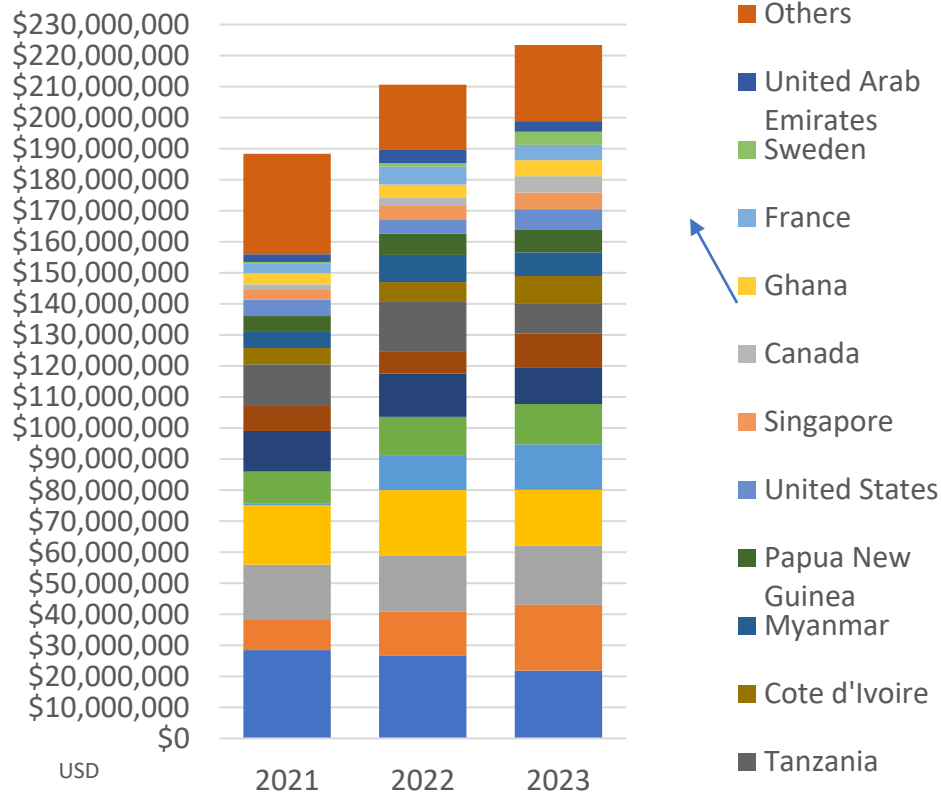
However, there was a 2% decrease in the value of shipments over the period, falling to USD 5.38 million.

White oak, ash, red oak and maple dominated exports, with both ash and maple shipments rising from a very small base in the previous year.

U.S. hardwood log exports to India fell by 28% in volume and by 41% in value during the same period.



JAN-SEP 2023 - INDIA'S HARDWOOD LUMBER IMPORTS (USD)



Source: Trade Data Monitor

According to Trade Data Monitor, India imported a record USD 225 million worth of hardwood lumber during the first three quarters of this year.

For the first time, India's imports of hardwood lumber exceeded its imports of hardwood logs, which have been falling steadily for the past decade.

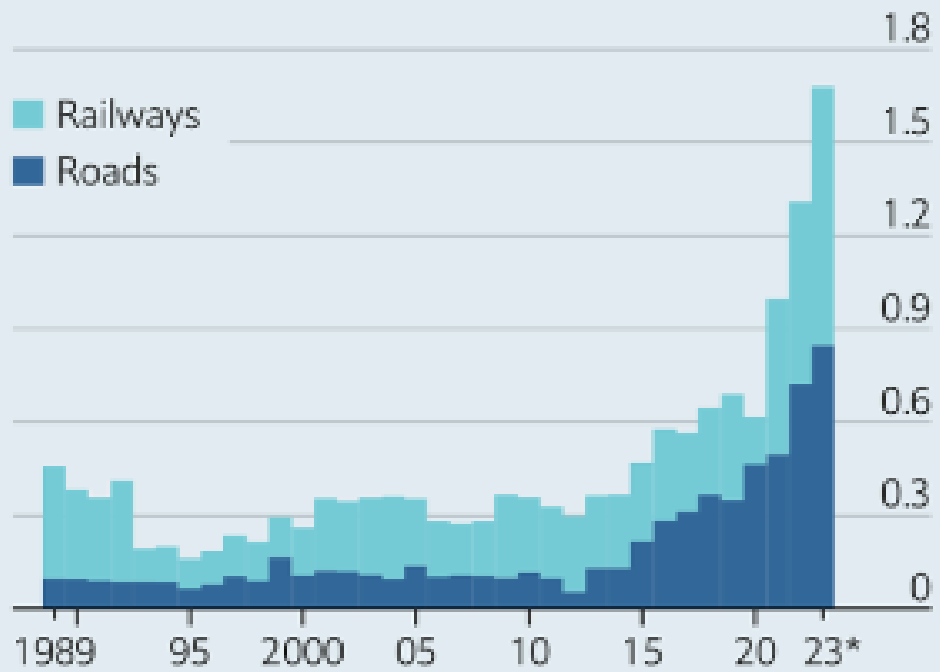
The US share of India's hardwood lumber imports during the period was only just over 2%.

India's main temperate hardwood lumber supplier was Germany.



Concrete objectives

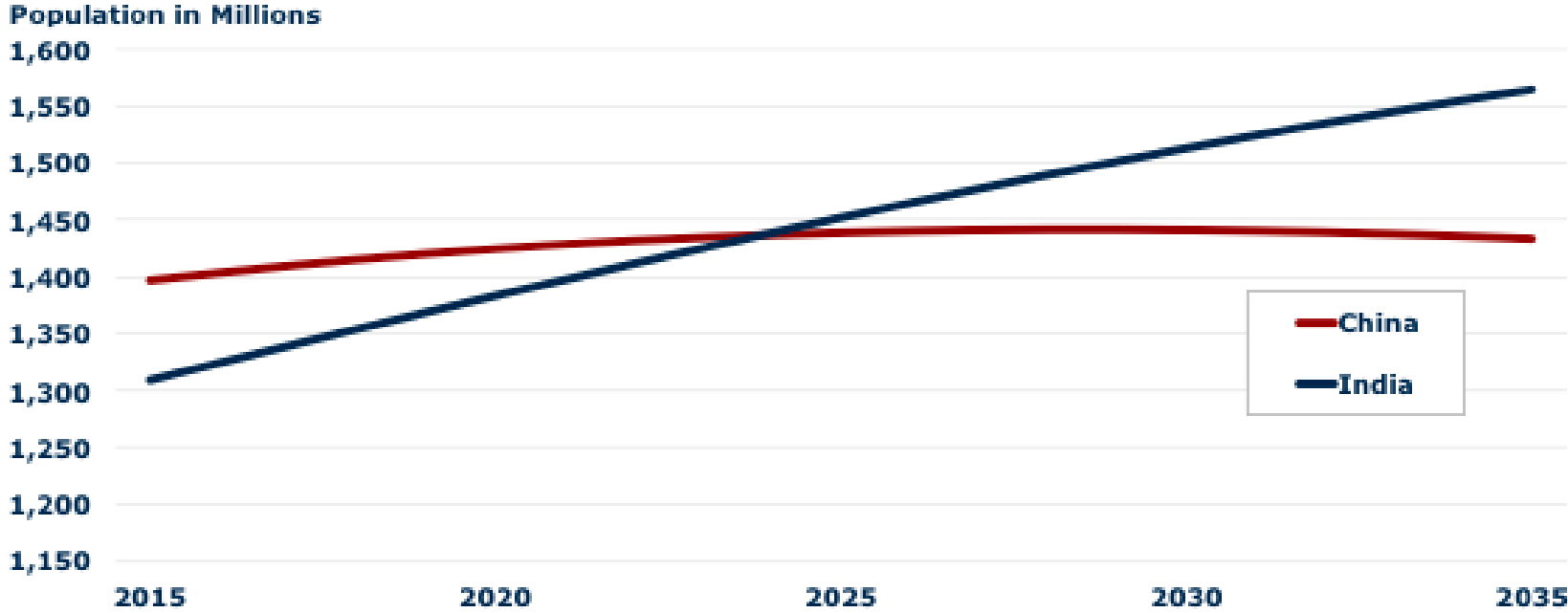
India, capital expenditure, % of GDP



Source: CMIE

*Forecast

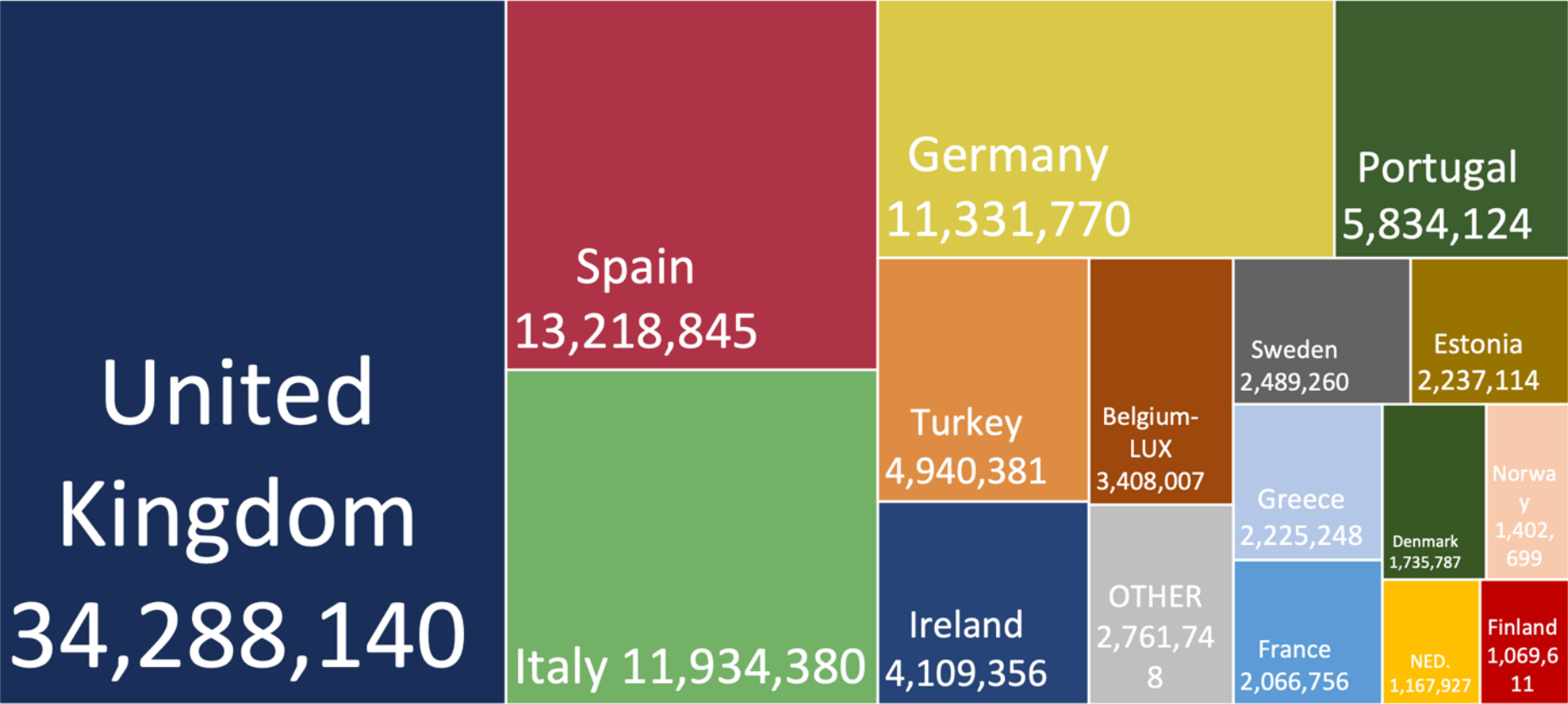
Population Growth in India Will Outpace China



Source: UN Population Division
Medium Variant Projections



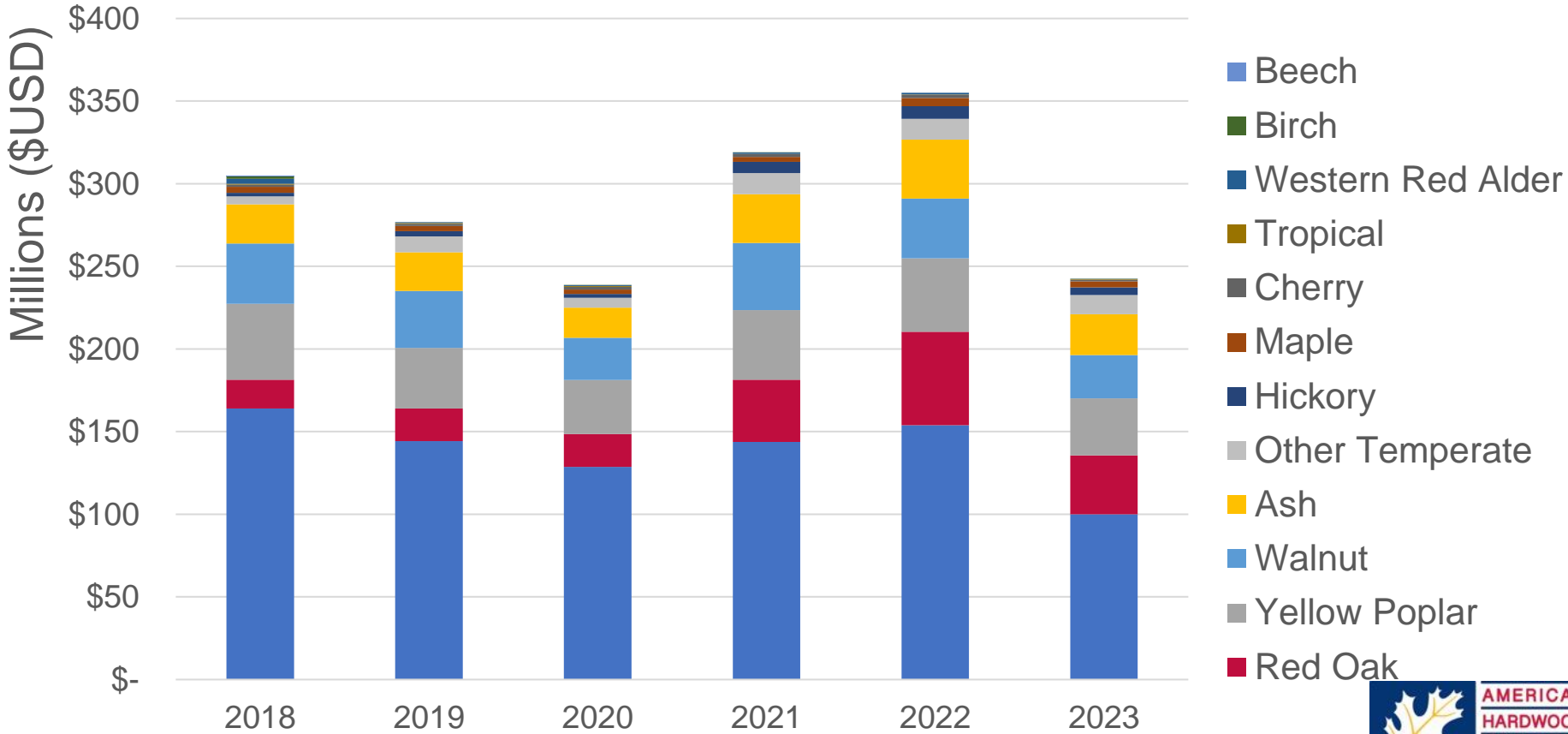
US Hardwood Lumber to Europe, 3Q 2023 in Board Feet



Source: USDA GATS, all years Jan-Sept Data



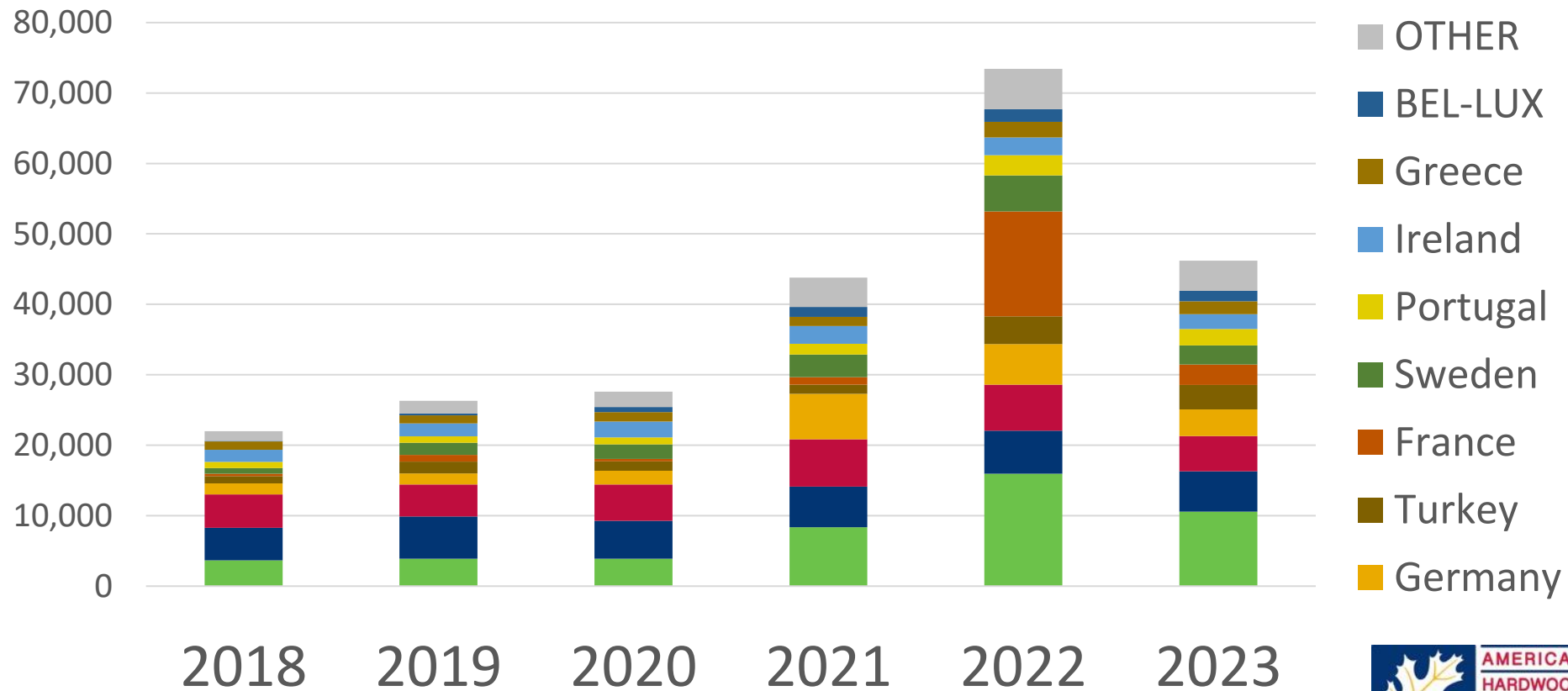
US Hardwood Lumber to Europe



Source: USDA GATS



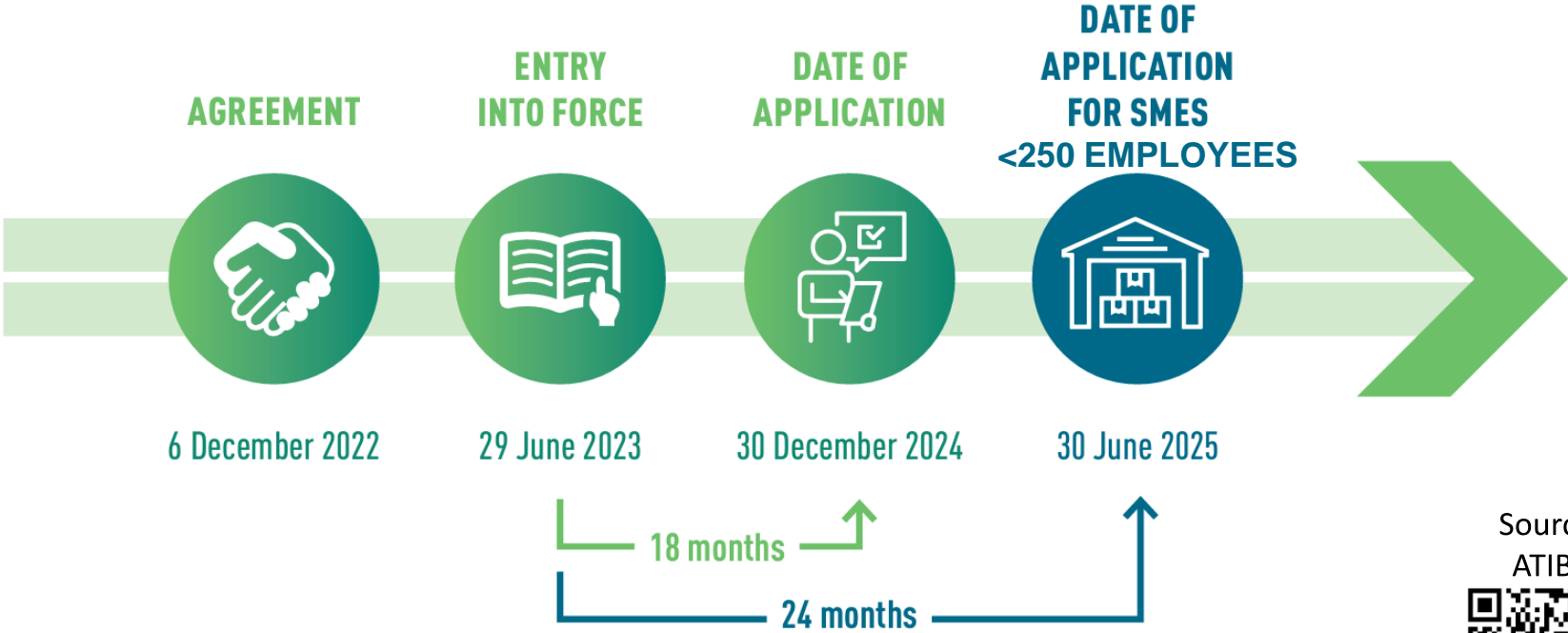
Red Oak Lumber to Europe (m3)



Source: USDA GATS



EUDR Timeline

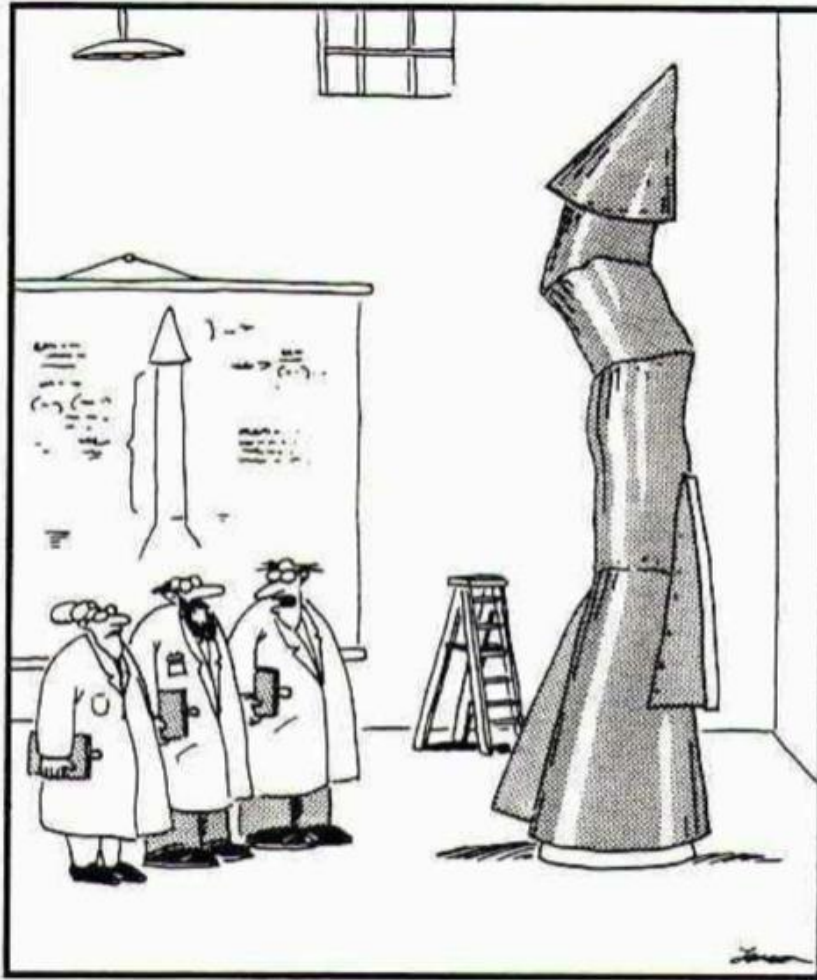


| | EUTR (Current) | EUDR (New Law) |
|--------------|--|--|
| Products | Timber | Timber, cattle, cocoa, coffee, oil palm, rubber, soya |
| Prohibitions | Illegally Harvested | Illegally harvested, contrary to social law, deforested, degraded |
| Traceability | To Country of harvest, beyond that to <u>the extent necessary to demonstrate negligible risk</u> | Geolocation of "plot of land(s)" where harvesting took place with each consignment irrespective of risk |



Pulp and Paper Markets

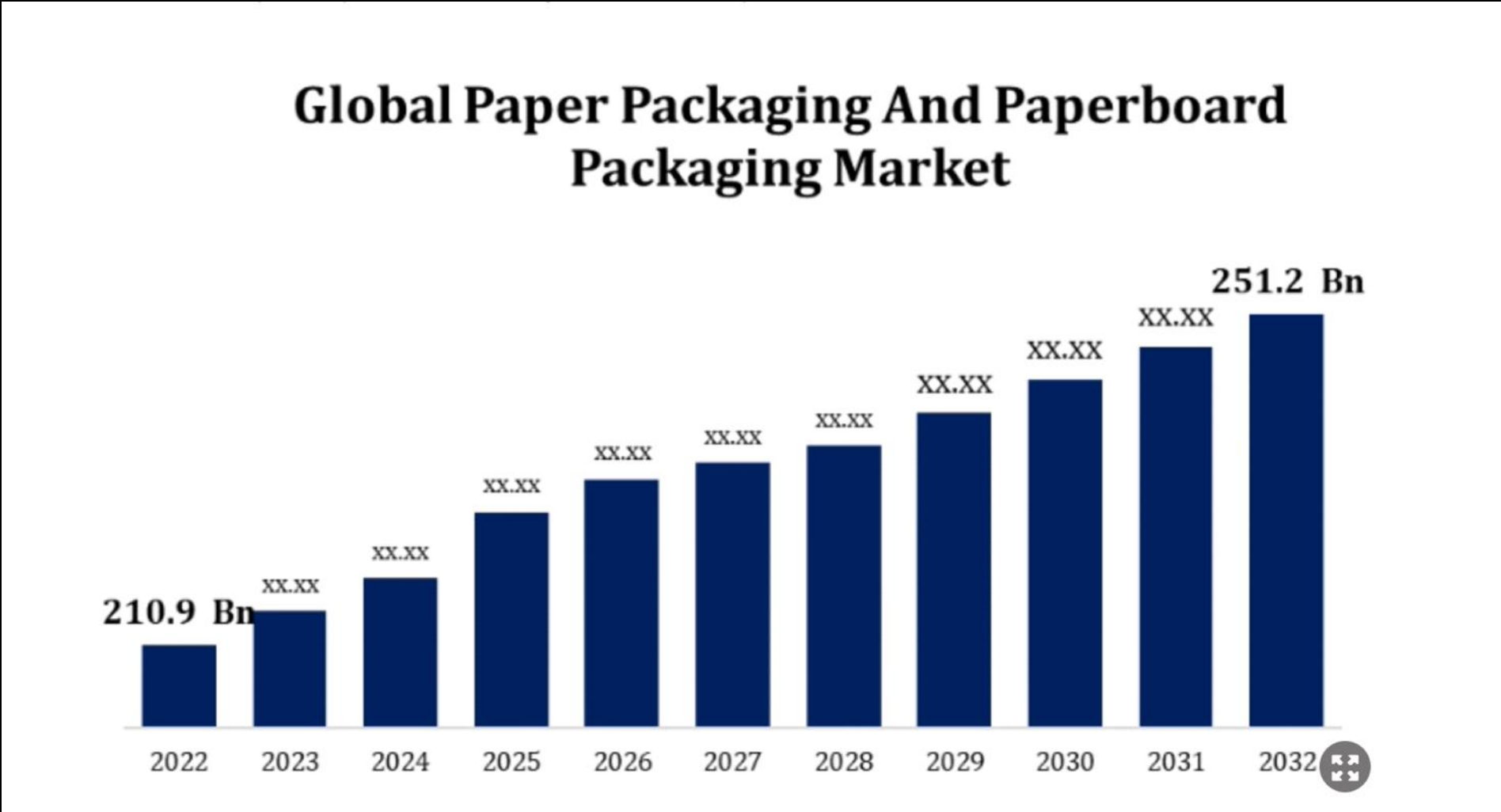
Pulp and Paper in WI



"It's time we face reality, my friends. ...
We're not exactly rocket scientists."

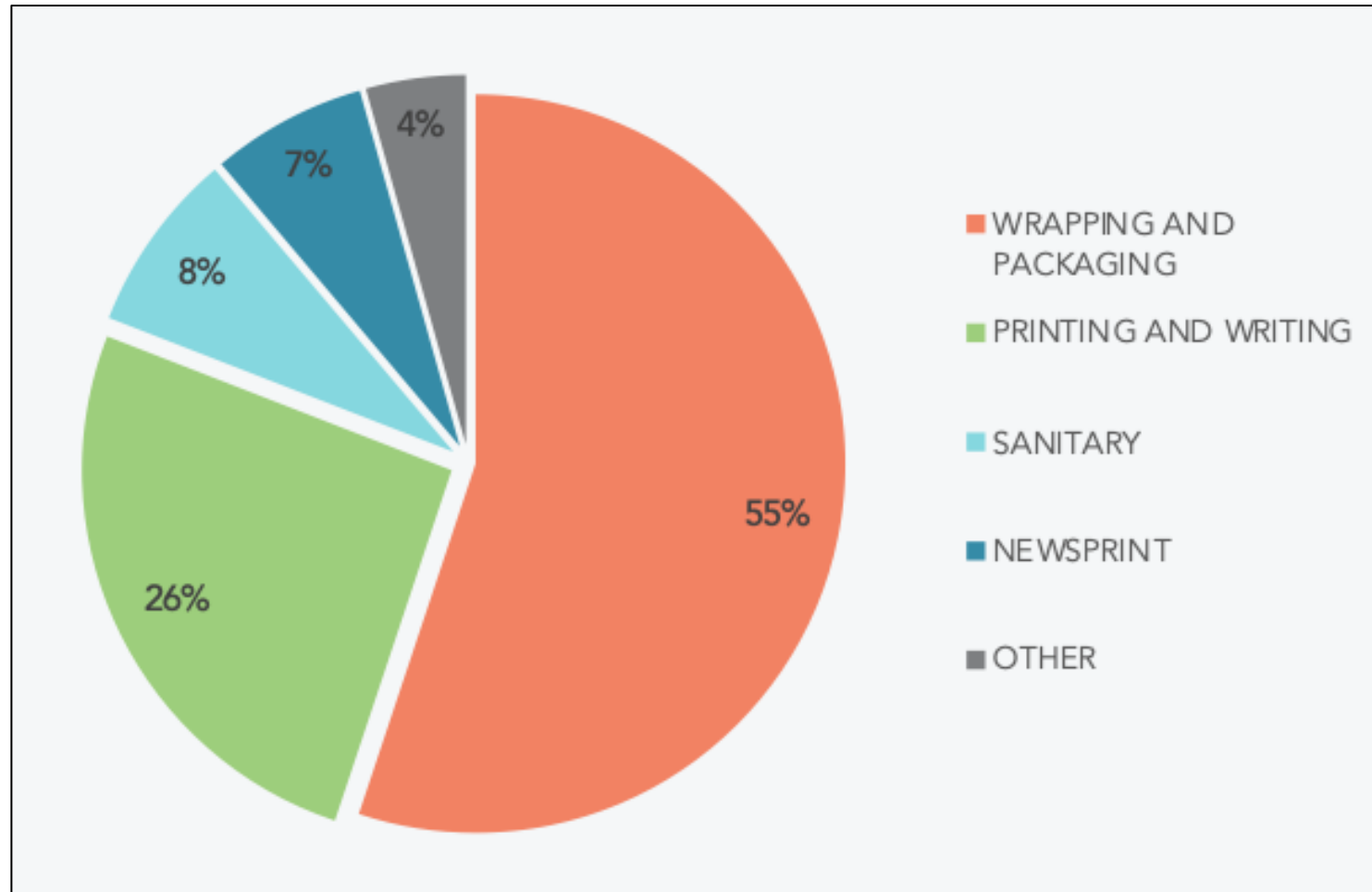
- The paper industry is complicated
- Just like softwood and hardwood markets, Paper markets are not bound by the borders of the state – It's Global!

Global Paper & Paperboard Packaging Market is estimated to be \$251.2 billion by 2032 with an average growth rate of 3.6%



Source: <https://www.globenewswire.com/>

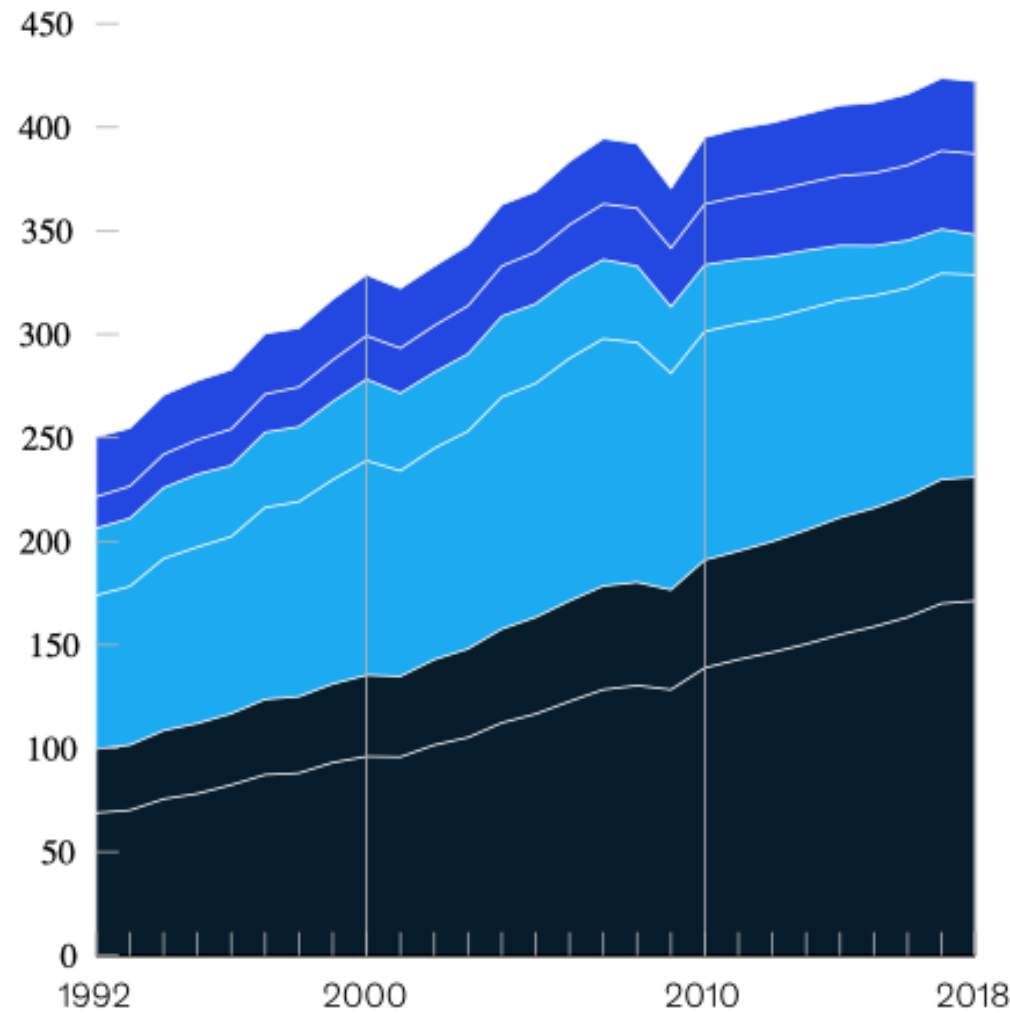
Global consumption by paper category?



(Source: EPN - State of the Global Paper Industry, 2018)

The global paper and paperboard industry continues to grow despite decline in the graphic-paper segment.

Global paper and paperboard market, million metric tons

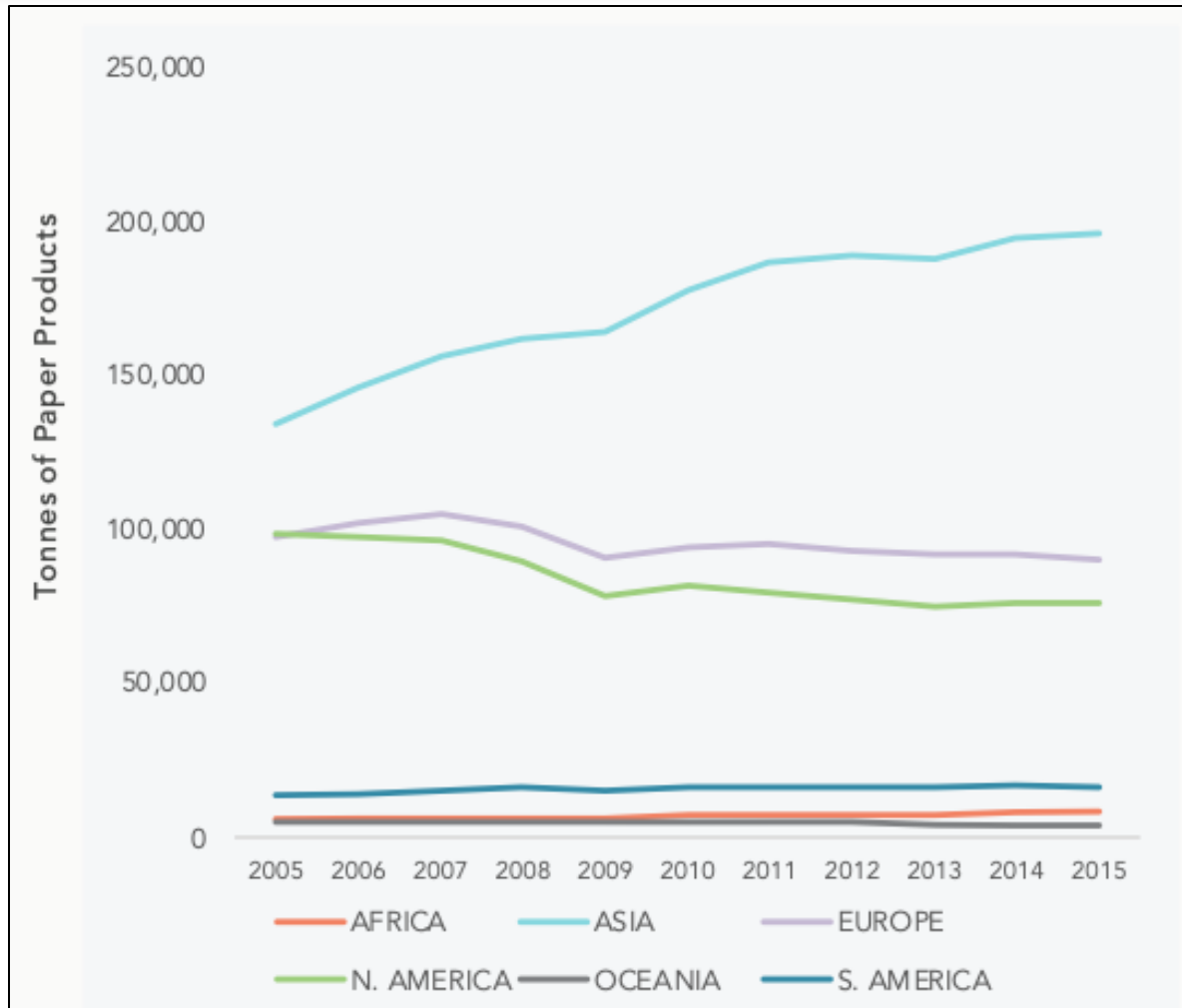


| | | CAGR, ¹ 1992–2007, % | CAGR, 2010–18, % |
|--------------------------|----------------------|---------------------------------------|------------------------|
| Other | Others | 0.6 | 1.1 |
| | Tissue | 3.9 | 3.6 |
| Graphic paper | Newsprint | 1.1 | -6.1 |
| | Printing and writing | 3.2 | -1.5 |
| Packaging | Carton-board | 3.3 | 1.7 |
| | Container-board | 4.3 | 2.7 |
| Average per annum | | 3.0 | 1.0 |

¹Compound annual growth rate.

Source: Resource Information Systems Inc (RISI), Feb 2019

Paper Consumption by Region



Avg: 55kg/yr
NA: 215kg/yr
Europe: 147kg/yr
China: 76kg/yr
India: 9kg/yr

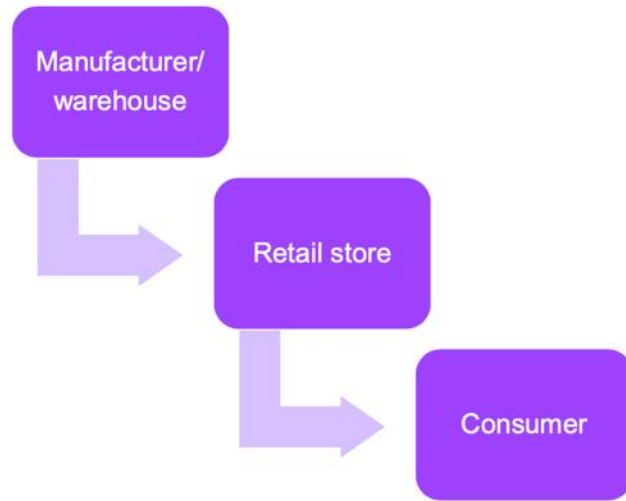
(Source: EPN - State of the Global Paper Industry, 2018)



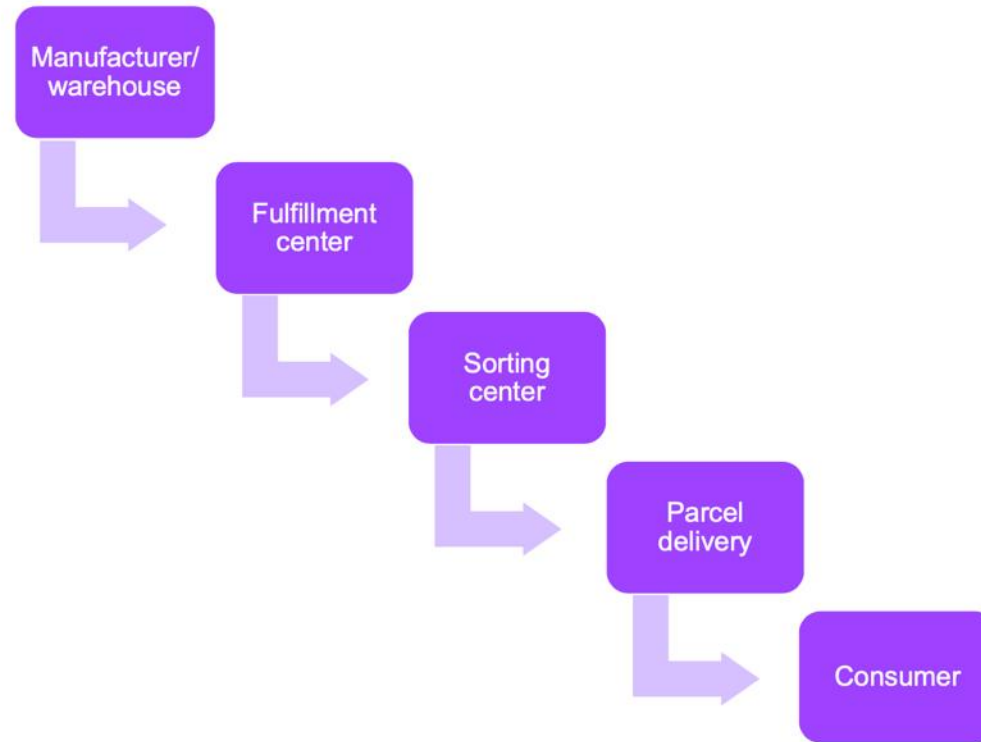
E-commerce retail uses seven times more corrugated per dollar than traditional retail



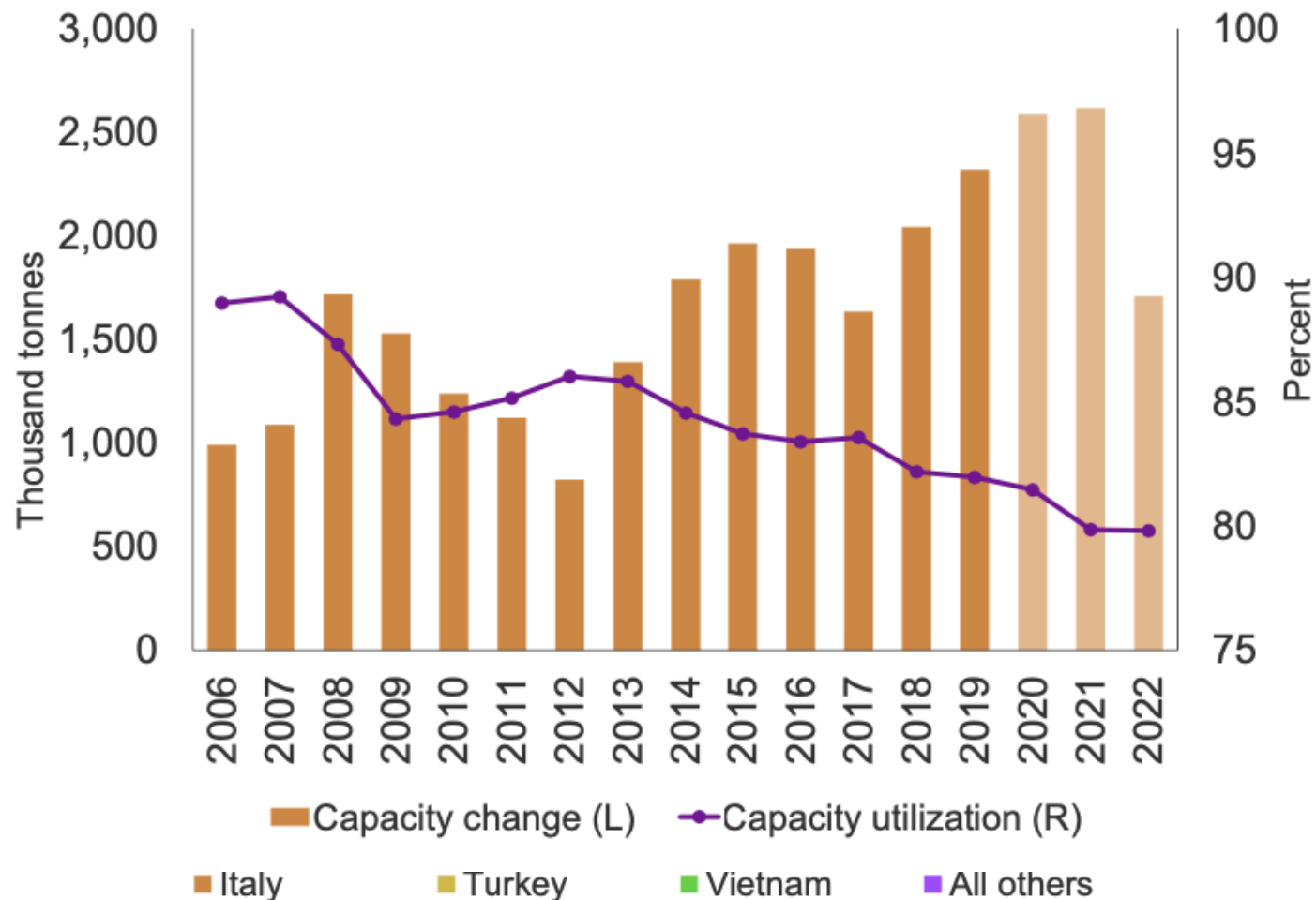
BRICK-AND-MORTAR LOGISTICS



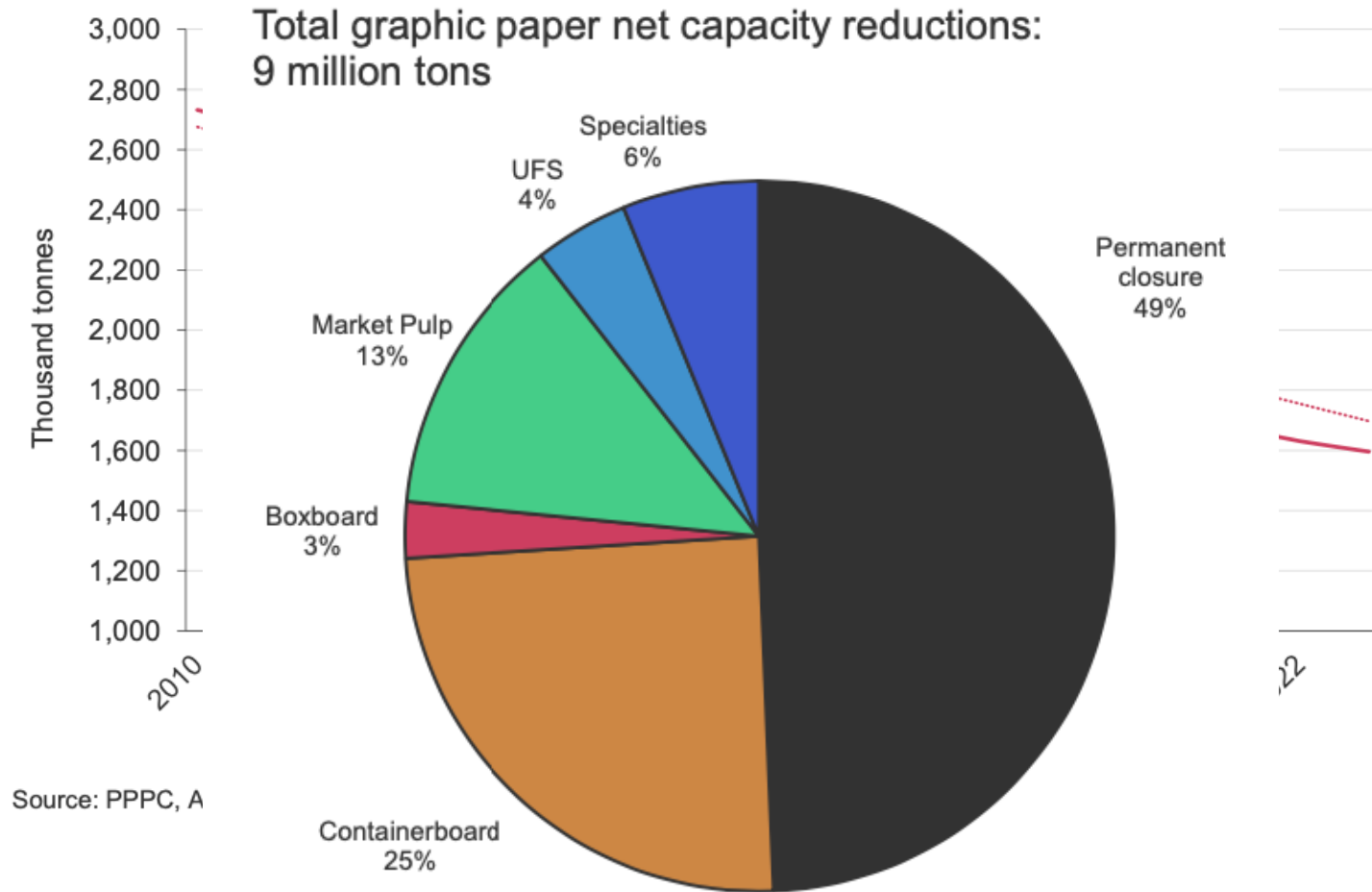
E-COMMERCE LOGISTICS



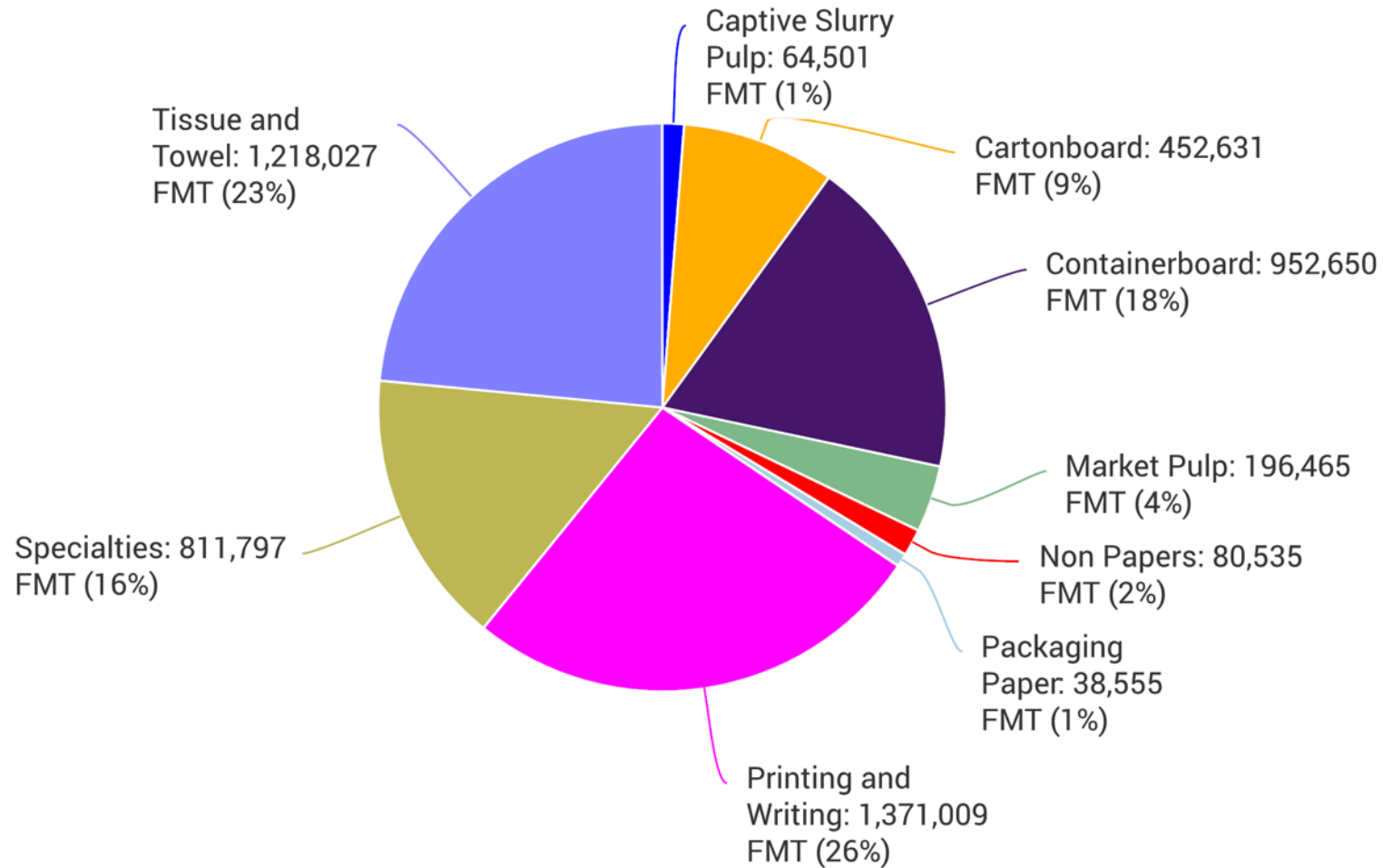
Tissue Growth & Capacity



Writing Paper



Diversity of pulp & paper production in WI



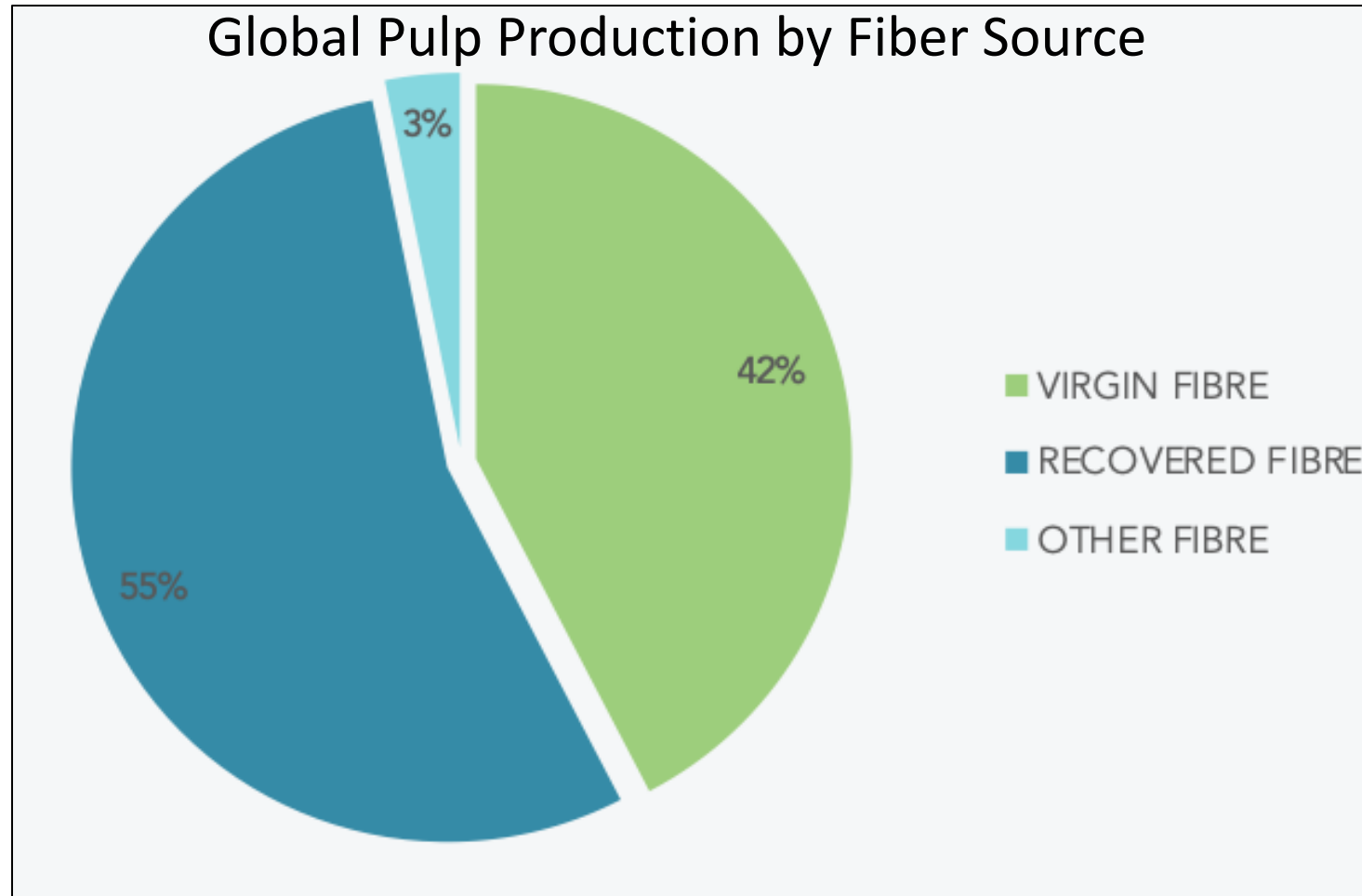
(Source: Wisconsin Institute of Sustainable Technology, 2019)

Specialty Papers in Wisconsin



(Source: Wisconsin Paper Council - www.wipaper.org)

Where does recycled fiber fit?



(Source: EPN - State of the Global Paper Industry, 2018)

Future for Pulp & Paper

- Be vigilant and watch for the declining market segments.
- Build upon our strengths - specialty and packaging:
 - Market pulp
 - Food packaging & virgin fiber

Closing Remarks

- Healthy forests depend upon a healthy forest industry!
- We live and operate in a global marketplace.
- Domestic markets driving hardwood and softwood lumber.
- Expanding pulpwood options is an important goal for Wisconsin.

Wood Markets Update

Questions?

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