

# GLOBAL MARKET VIEW AND IRA IMPACT

May 2023

# AGENDA

- Market Vision
  - Secular Trends
  - Global Market Overview
- Inflation Reduction Act
  - Impact
  - Opportunities



**MARKET VISION:**  
**SECULAR TRENDS**

# WHAT WE ARE SEEING AND THE IMPACT ON KEY MARKETS



## SECULAR TRENDS ACCELERATING



Relative to before the pandemic, we are seeing **faster, more pronounced shifts toward...**

Consumers, policymakers and investors approaching **Sustainability** with urgency

**Productivity** becoming more critical as skilled labor shortages have become even greater

Government spending driving **demand for more - and more resilient infrastructure**



## ECONOMIC & GEOPOLITICAL UNCERTAINTY



Geopolitical risks and trade tensions continue to increase

The most complex macro environment in last 40 years leading to **market volatility**

Resilient inflation, high interest rates, mixed consumer spending signals, supply chain woes easing but remaining, labor imbalances, commodity prices coming off highs, heightened geopolitical tensions

Strong regional regulations and protectionism



## CHANGES IN END-USE MARKETS



**Most markets remain solid** in terms of underlying demand outlook and fundamentals

**Wind energy** demand remains high; favorable policy backdrop remains a catalyst for growth

Monetary policy focused on **infrastructure** spending, driving composites demand

**Automotive** outlook improved

Some **consumer** markets declining

# MAIN TRENDS BY END USE MARKET

## Markets

### Building & Construction



### Renewable Energy



### Infrastructure



### Transportation



## Key Trends

- Light-weighting, prefabrication and modular construction.
  - Sustainable construction: better insulation, higher durability, improved energy efficiency, etc
  - Urbanization to deal with more denser cities.
- 
- Decarbonization of energy production
  - Electric and Hydrogen fueled vehicles
  - Increasing demand for higher modulus
- 
- Renewal of infrastructure
  - Shorter supply chain and sustainability
  - Demand for higher reliability and resilience, driving conversions to FRP
- 
- Light-weighting to improve fuel efficiency and reduce carbon emissions
  - Sustainability (Electrification, alternative fuels, use of sustainable materials, etc)
  - Shared mobility, connectivity, autonomous driving to increase safety and increase efficiency.

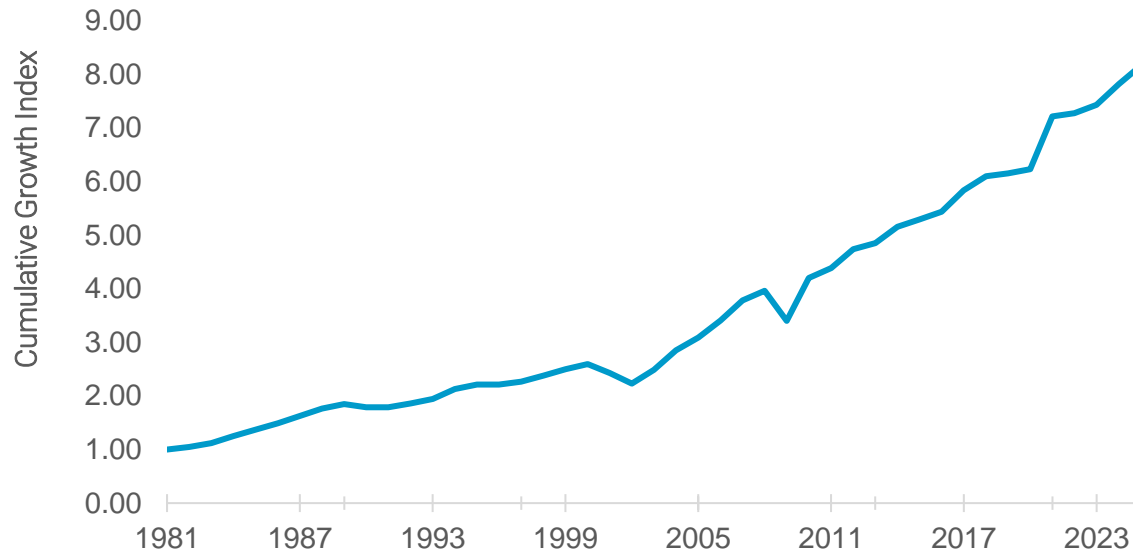


**MARKET VISION:**  
**GLOBAL OVERVIEW**

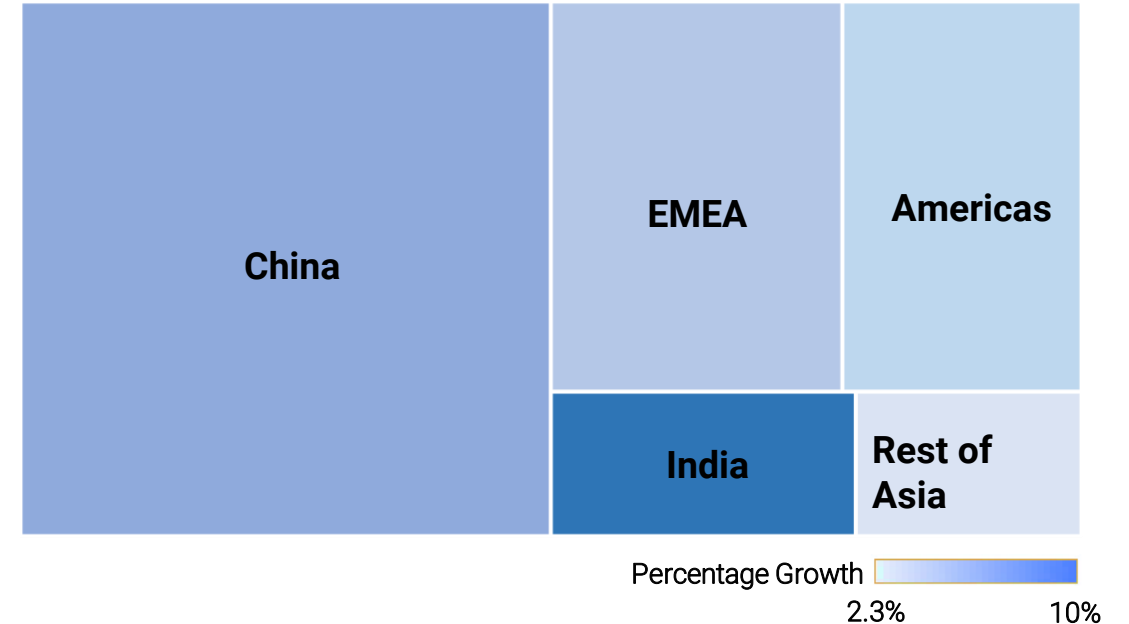
# GLASS FIBER MARKET OUTLOOK

## LONG-TERM GLASS FIBER GROWTH DRIVEN BY INDUSTRIAL PRODUCTION AND NEW APPLICATIONS

**Glass Fiber Demand**  
40+ Years Averaging 5% CAGR



**2019-2022 Demand Growth by Region**



### Megatrends

Population  
Urbanization  
Sustainability



Industrial  
Production Growth 2-3% CAGR

**x**

Material  
Substitution 1.6\*



### Implied Glass Fiber

GlassFiber growth of  
~ 4-5% per year

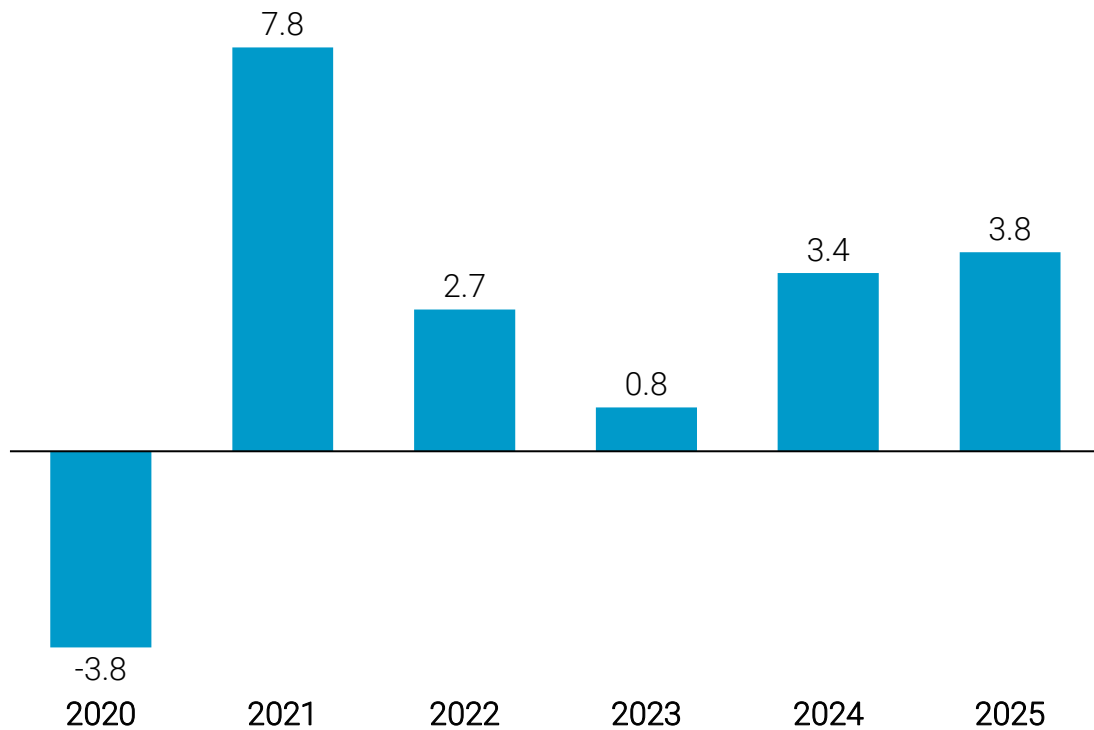
\* Multiple based on long term average

Sources: Fiber economic bureau, Glass Fiber Europe, Global Trade information Services, inc. and Owens Corning management estimates; Glass fiber market demand excludes E-glass yarns

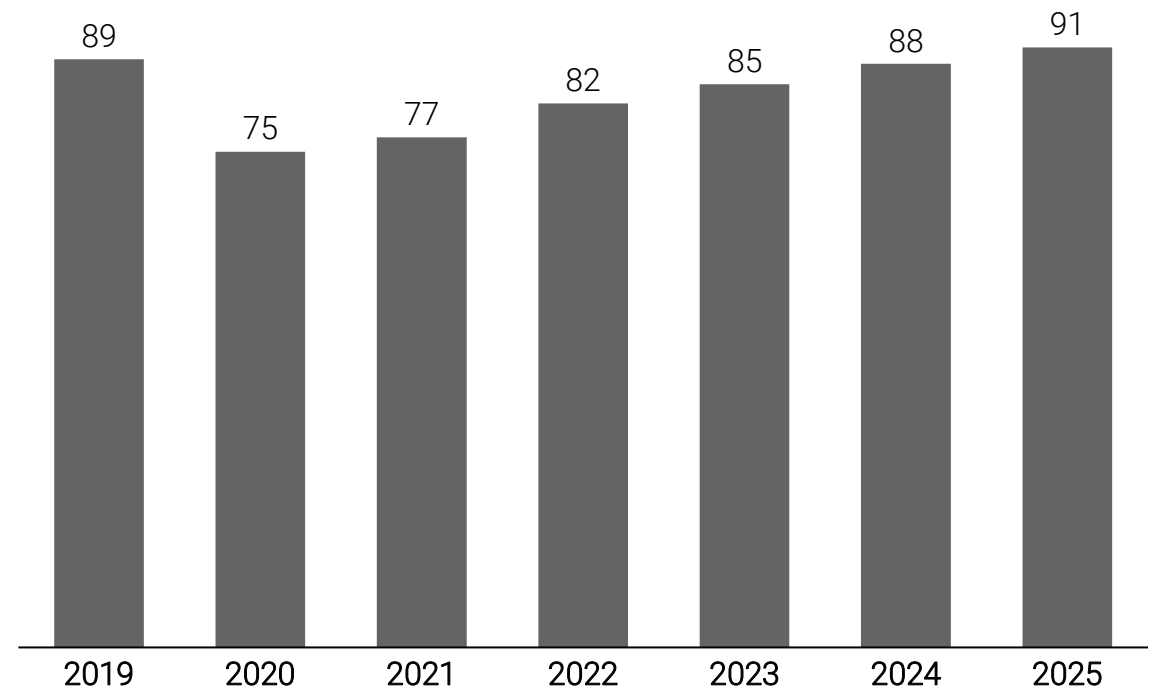
# INDUSTRY SLOW-DOWN IN 2022 AND 2023, RECOVERY IN 2024

Gradual recovery in automotive as supply disruptions fade

### Global Industrial Production (% Y/Y)

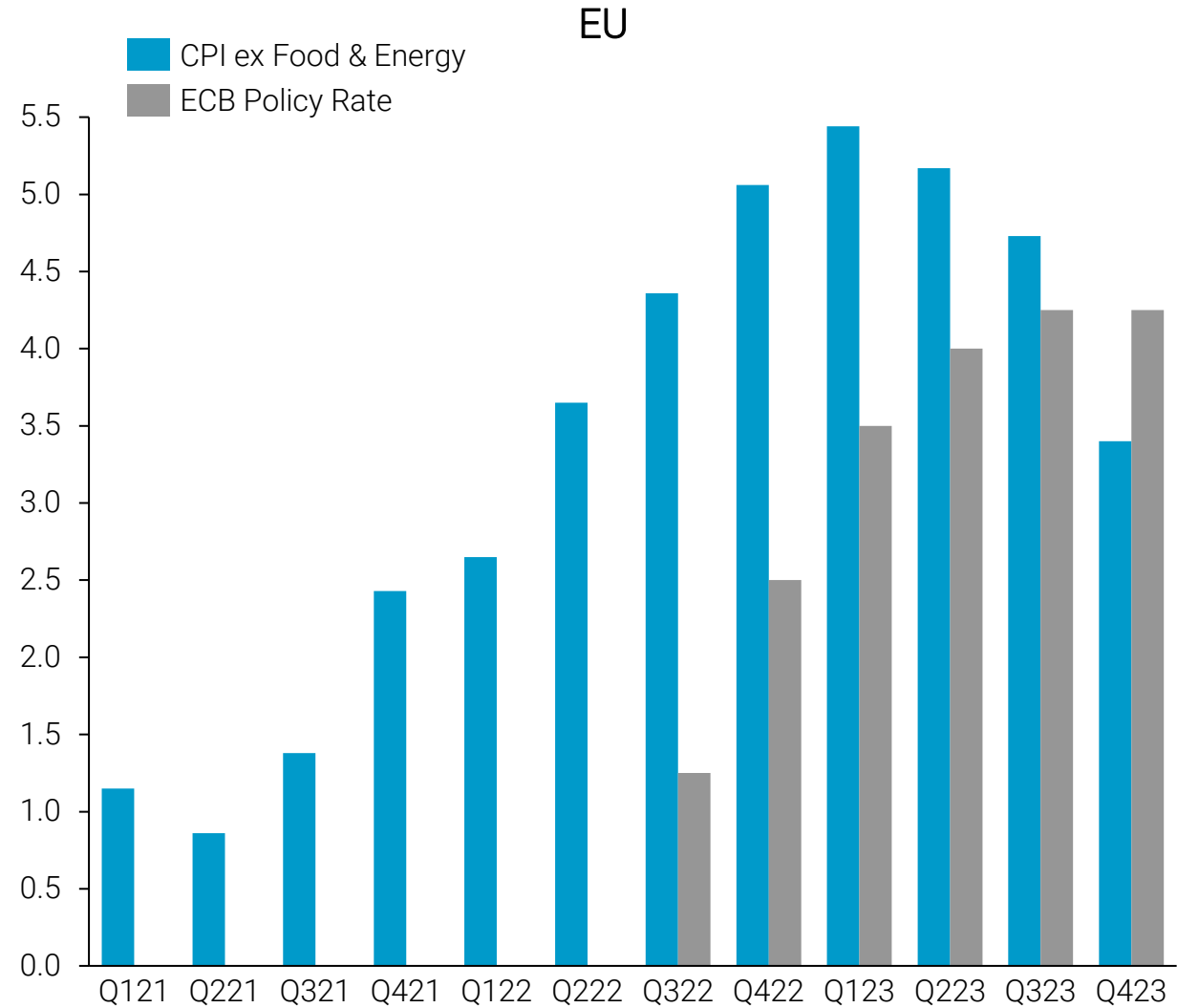
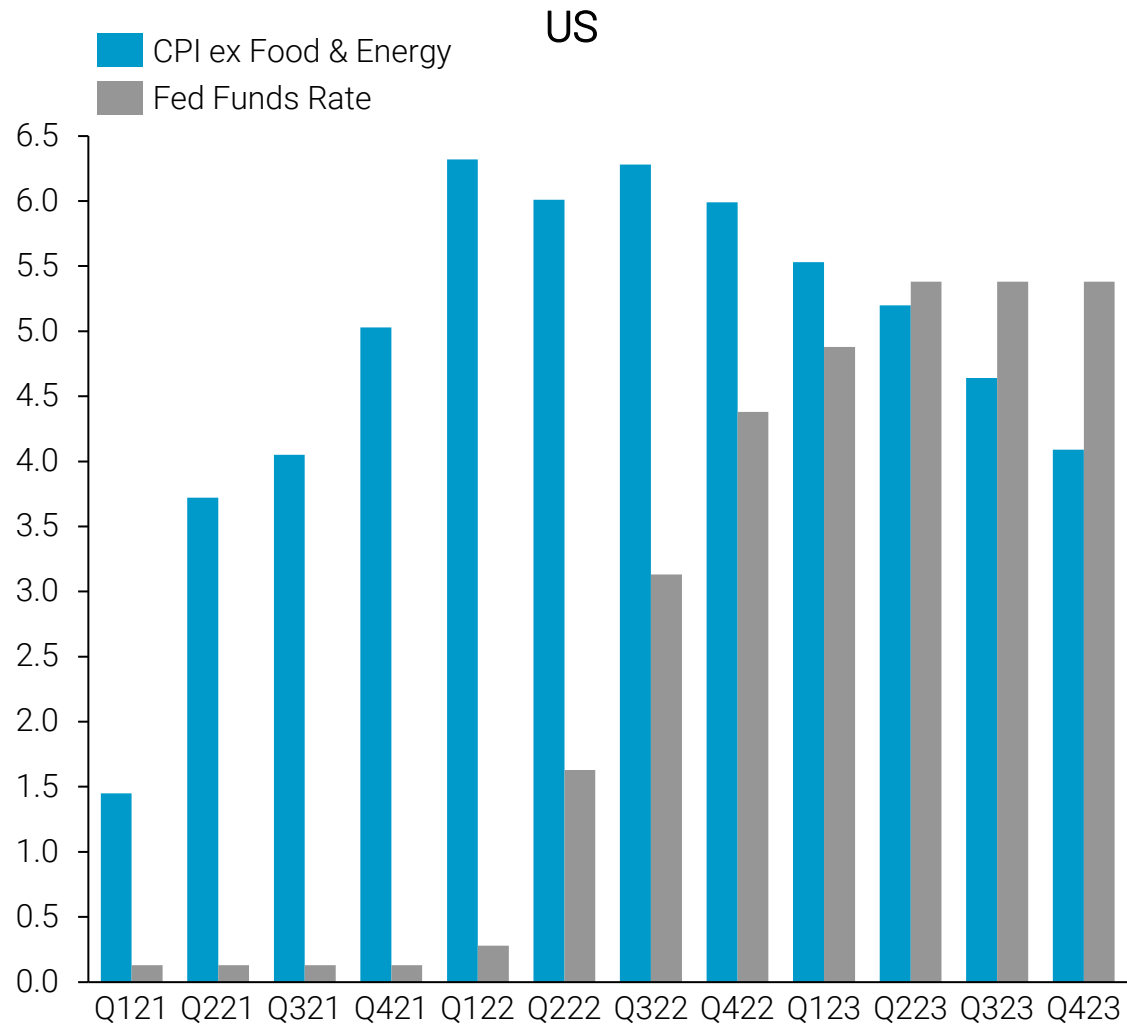


### Global Light Vehicle Production (MM Units)

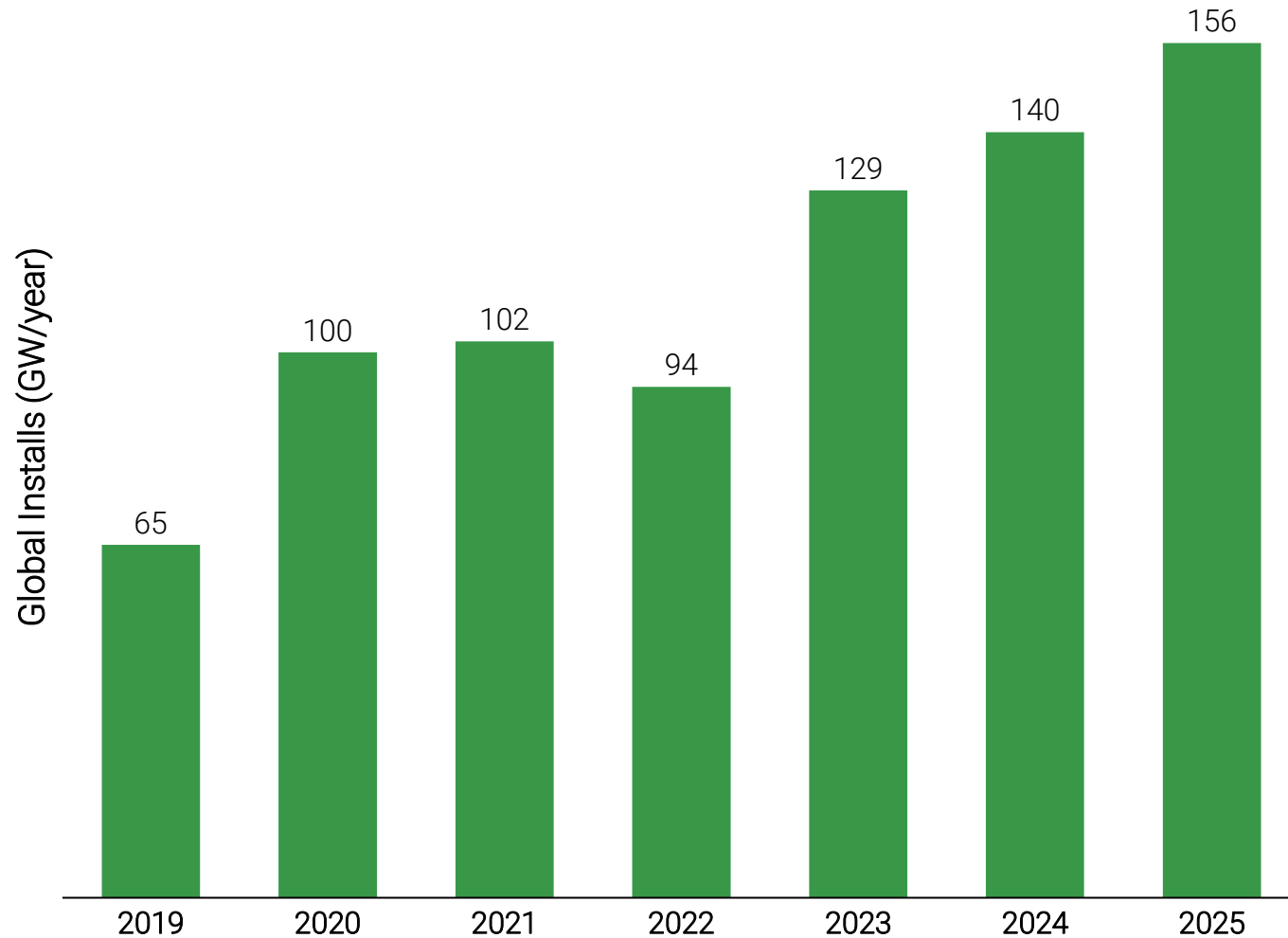




# CORE INFLATION REMAINS ABOVE THE 2% TARGET IN 2023



# STRONG NEAR-TERM WIND DEMAND AND BULLISH LONG-TERM OUTLOOK



## Global Wind Market Insight



How we power our world is evolving rapidly as clean energy takes over:

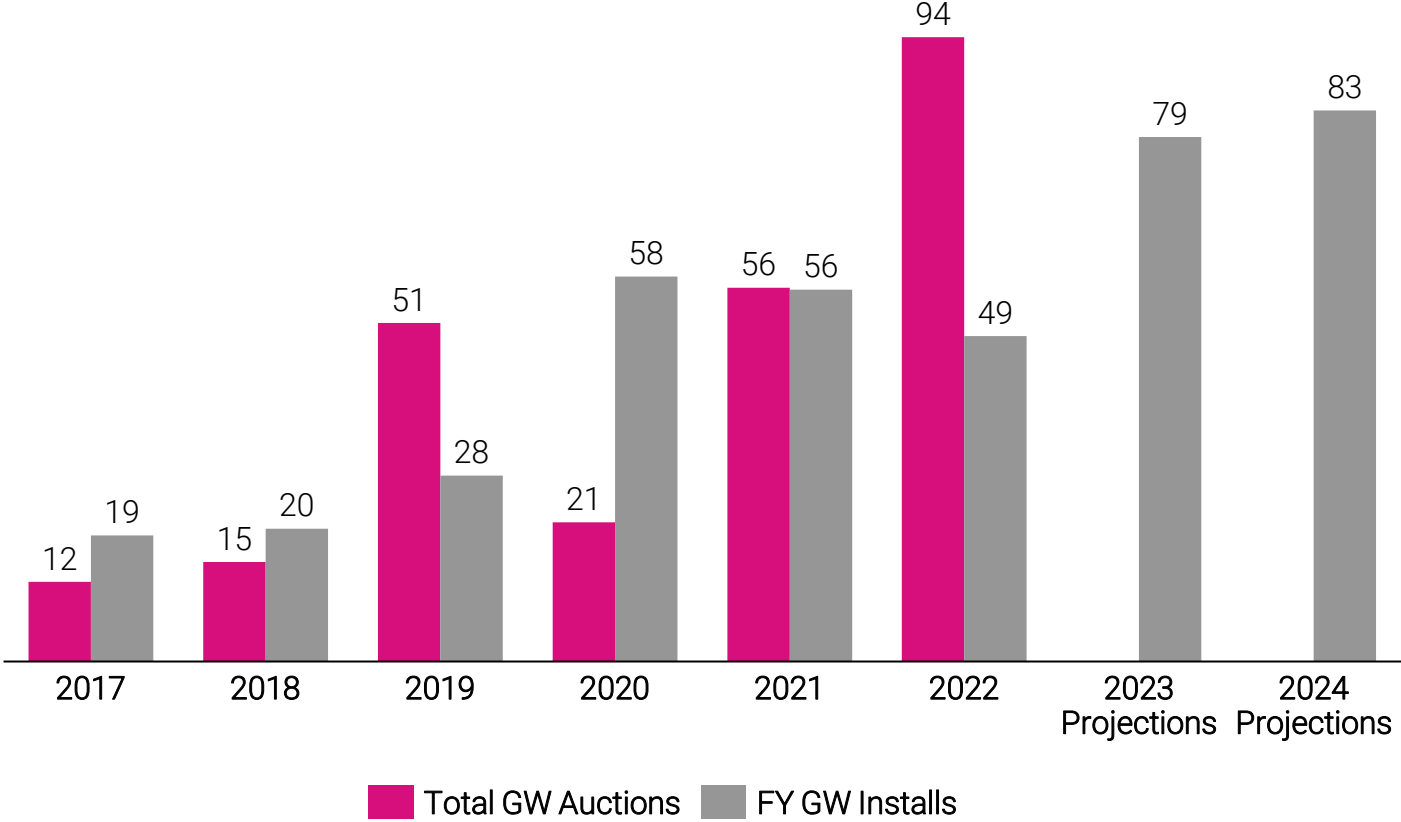
Underlying demand in wind energy is outpacing installed capacity of the material supplier base

Rising geopolitical tensions drive increased emphasis on energy independence in the EU

China, Europe and the US government agendas all create potential upside to the base case outlook

# CHINA WIND AUCTIONS ACCELERATED IN '22 RESULTING IN BIG UPSIDE IN '23

China Wind Auctions & Installs (GW/year)



China government announced RMB 100 billion stimulation for renewable energy in May 2022 and overall production & demand started to rebound in August 2022

2023 was upgraded by more than 20GW vs Q4 forecast, based on a 94GW order intake and 10GW delayed projects

Note: Turbine Installation / grid connection can take anywhere from 6-18 months after auction stage

# OUTLOOK ON GLOBAL GLASS MARKET

Global growth has remained resilient despite projected recession on horizon

Demand growth decelerates in 2H,  
most global inventories  
replenishing

Growth recovers as inflation  
falls and central banks ease  
financial conditions

2021

2022

2023

2024-  
2025

Sharp recovery & low inventory

Mild recession expected in US &  
EU, now pushed out to 2H 2023



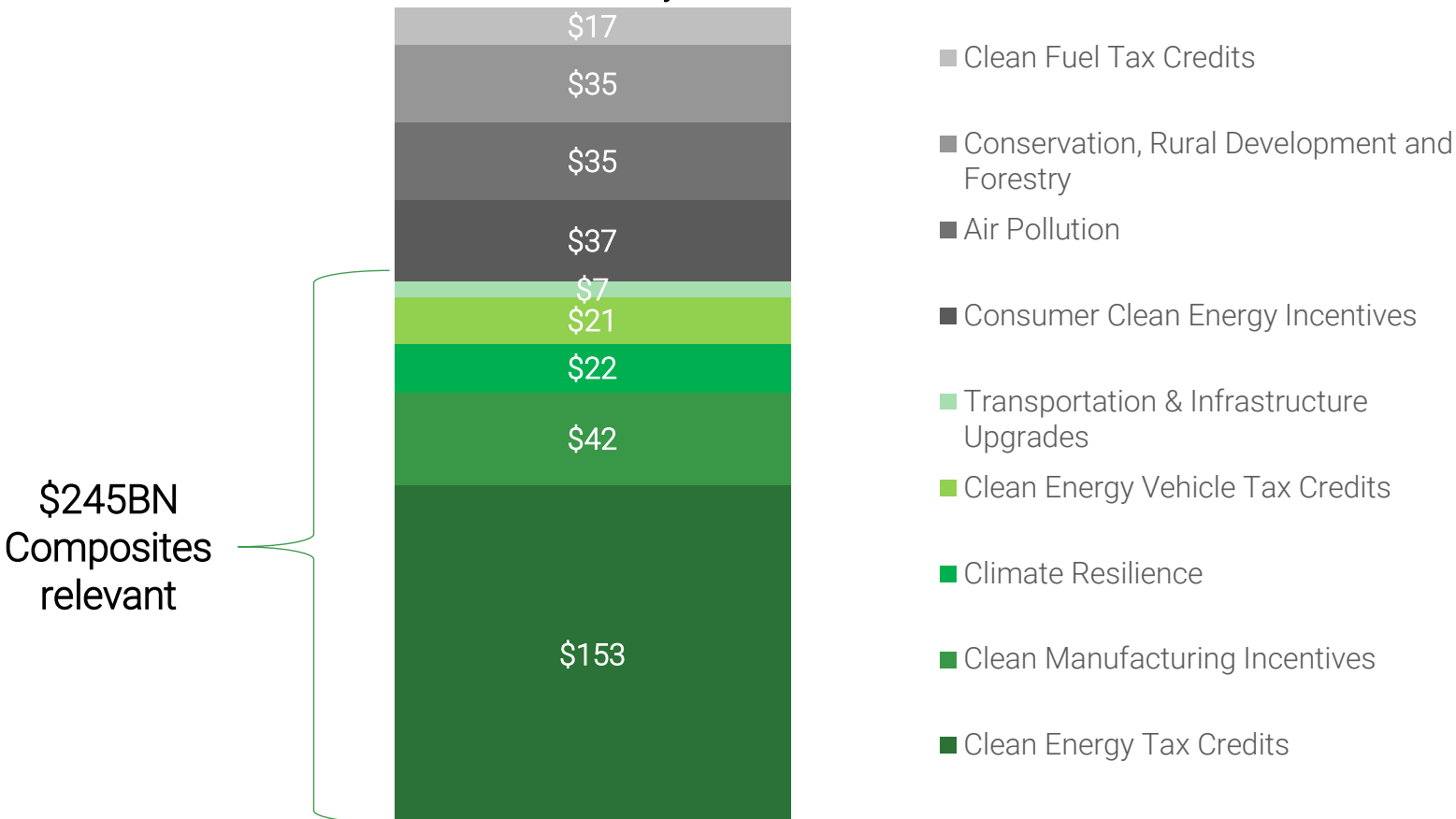
**INFLATION REDUCTION ACT**  
**IMPACT & OPPORTUNITIES**

# THE IRA WILL INVEST \$369BN INTO NEW CLEAN ENERGY AND CLIMATE PROGRAMS

## OVER 60% OF FUNDING IS RELEVANT TO THE COMPOSITES INDUSTRY

Inflation Reduction Act Climate Spending (\$BN)

\$369BN over 10 years



### Highlights:

- Estimated to reduce US GHG emissions 40% vs. 2005 by 2030, (goal is 50%)
- Projects include:
  - \$135BN to ramp up wind and solar
    - Tax credits available for producers, including utilities and non-utilities
  - \$9.7BN for **rural electric systems** to improve reliability, affordability and long-term resiliency
  - \$0.8BN to accelerate interstate transmission line siting
- Eliminates the PTC phaseout for wind projects placed in service after Dec. 31, 2021

# IIJA & IRA FUNDING TO CREATE EXPONENTIAL GROWTH FOR GREEN TECH. COMPOSITES POISED TO PLAY A KEY ROLE IN BUILDING THE NET ZERO ECONOMY



Wind demand to **double**<sup>1</sup> by second half of the decade  
Solar deployments to grow **5x by 2024**<sup>2</sup>, 10x by 2030<sup>1</sup>

Electric Vehicle sales to increase **5x by 2030**<sup>3</sup> reaching 30% of US auto sales



Total US **energy storage to double in 2023**<sup>4</sup> alone, could triple in 2024 if supply is available

Continued electrification increases need for **grid resiliency, \$75BN**<sup>5</sup> in direct funding between IIJA and IRA

\$8BN in IIJA Funding and **\$3/kg tax credit**<sup>6</sup> makes **Green Hydrogen** less expensive than Gray Hydrogen for first time

1. Wood Mackenzie energy forecasts

2. <https://pv-magazine-usa.com/2022/08/04/princeton-solar-deployment-to-increase-fivefold-under-inflation-reduction-act/>

3. <https://evadoption.com/ev-sales/ev-sales-forecasts/>

4. Catalyst Podcast: Is the Inflation Reduction Act a win for EVs and Batteries?

5. Infrastructure category breakout based on \$550B in new spending. Source: The US Bipartisan Infrastructure Law: Breaking it Down – McKinsey & Company – November 12, 2021.

6. <https://www.utilitydive.com/news/the-ira-will-accelerate-electrolyzed-hydrogens-future-heres-what-that-me/632925/#:~:text=The%20Inflation%20Reduction%20Act%20offers.and%20wage%20requirements%20are%20met.>

7. <https://www.energy.gov/eere/fuelcells/hydrogen-shot>

# MANUFACTURING TAX CREDITS AVAILABLE FOR EXPANSION, RECYCLING AND SUSTAINABILITY PROJECTS TO HELP U.S. MEET CLIMATE GOALS

## Advanced Energy Project Credit Section 48C – Up to 30% Credit<sup>1</sup>

- \$10BN total, application opens 5/31 concept papers due 7/31, apply through IRS/Treasury Department
- Earn by **establishing, expanding or re-equipping** facilities that produce or recycle the following:
  - Grid modernization equipment, wind & solar power, energy storage systems, electric vehicles
- Also available for projects that **reduce Scope 1** greenhouse gas emissions by **at least 20%**

## Advanced Manufacturing Production Credit Section 45X<sup>2</sup>

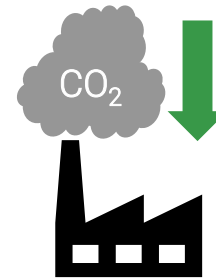
- Establishes tax credits for producing **wind and solar components**
  - Ex. blades, nacelles, towers, offshore wind platforms, fasteners, polymeric backsheets for solar
  - Tax Credit based on per watt calculation dependent on application
  - Cannot be claimed if already awarded Section 48C credit



Electric Vehicles



Grid Modernization



GHG Reduction and Recycling



Energy Storage



Wind and Solar Components



# IRA OFFERS ADDITIONAL OPPORTUNITIES TO LOWER SCOPE 2 EMISSIONS & EMBODIED CARBON

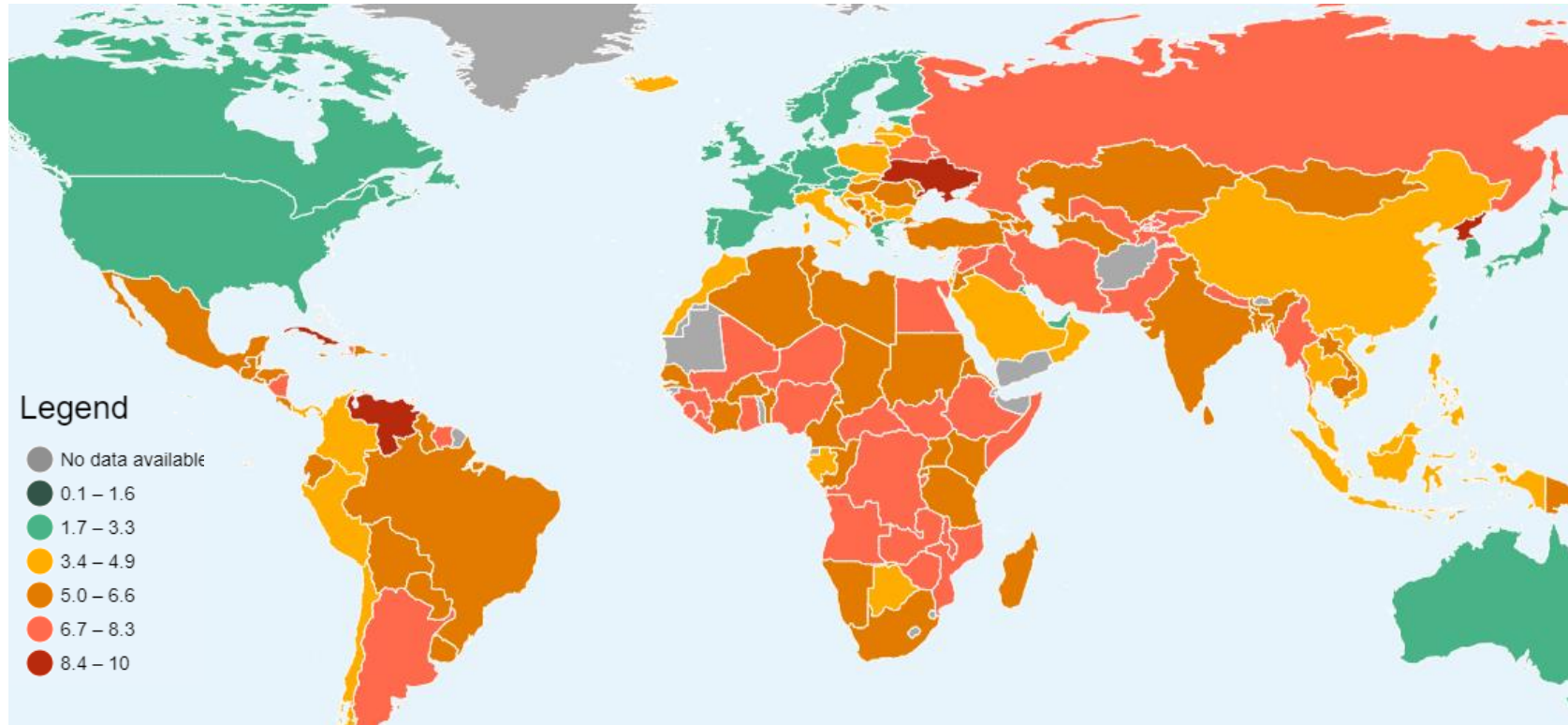
- Production Tax Credit – Section 45Y<sup>1</sup>
  - \$0.015/kWh of produced zero carbon electricity
    - Technology agnostic, requires prevailing wages
  - Available to utilities and owners/operators of electricity projects
  - Construction start date cutoff extended from 12/31/21 to 12/31/33
  - Domestic content threshold for wind, 40% pre-2025, maxes at 55% after 2028
    - +10% credit if met, -10% if not met in 2024, -15% in 2025, ineligible after 2026
    - +10% if project located in Energy Community (census zone with coal mine closed in last 20 years)
    - Up to 20% additional adder if part of low-income building project
    - +10% if 100% steel/iron used and 40% total components made in US



PTC will drive glass demand for wind while increasing access to low-cost renewables

# APPENDIX

# 2023 ECONOMIC RISKS MAP BY OXFORD ECONOMICS



Risk on a scale from 1 to 10, being 10 the highest

Factors that could impact the global economy and drive uncertainty:

1. Political instability (e.g. China-Taiwan, Russia-NATO, etc)
2. Trade tensions (e.g. China-US)
3. Fluctuations in commodity prices (e.i. oil)
4. Changes in monetary policy.
5. COVID-19: supply chain disruptions, labor shortages & consumer behavior.
6. Environmental risks: climate change, natural disasters...
7. Major cyber and terror Attacks

# NATURAL GAS PRICE LOWER AFTER VERY MILD WINTER IN THE US AND EU

## NA Natural Gas Price (USD/MMBtu)



US Natural Gas back to pre-pandemic levels

## EU Natural Gas Price (EUR/MWh)



EU Natural Gas sharp decline, but still much above 2021 levels

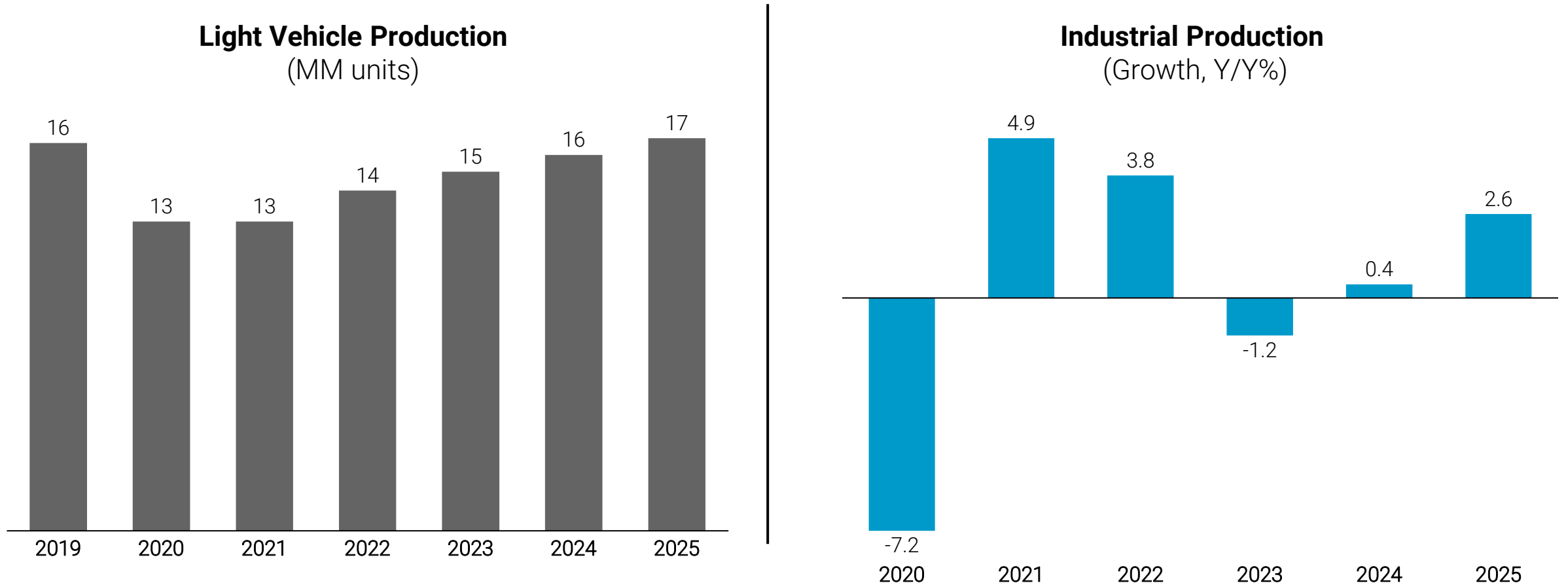


**REGIONAL FOCUS:**

**NA**

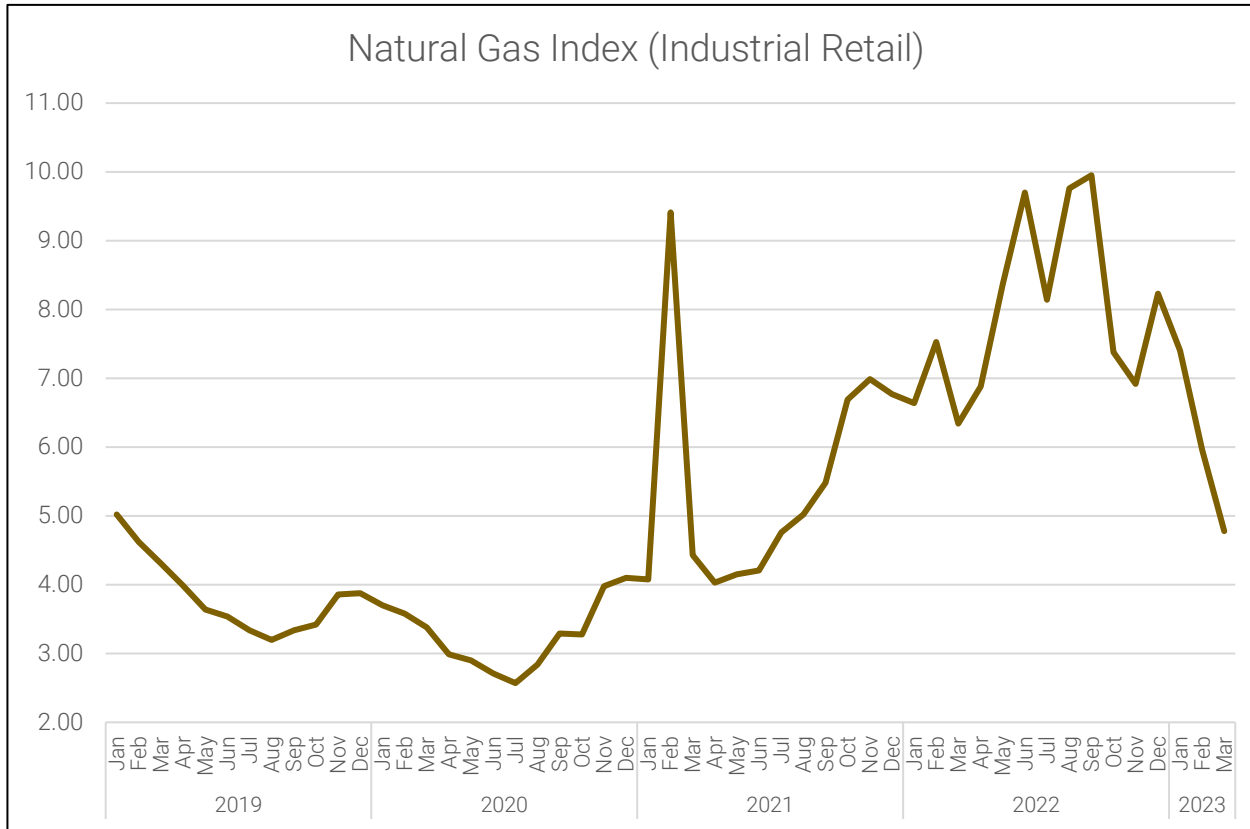
# NA INDUSTRIAL PRODUCTION EXPECTED FALL MODESTLY IN 2023

Automotive outlook hampered by chip shortages; pent-up demand has built amid supply constraints

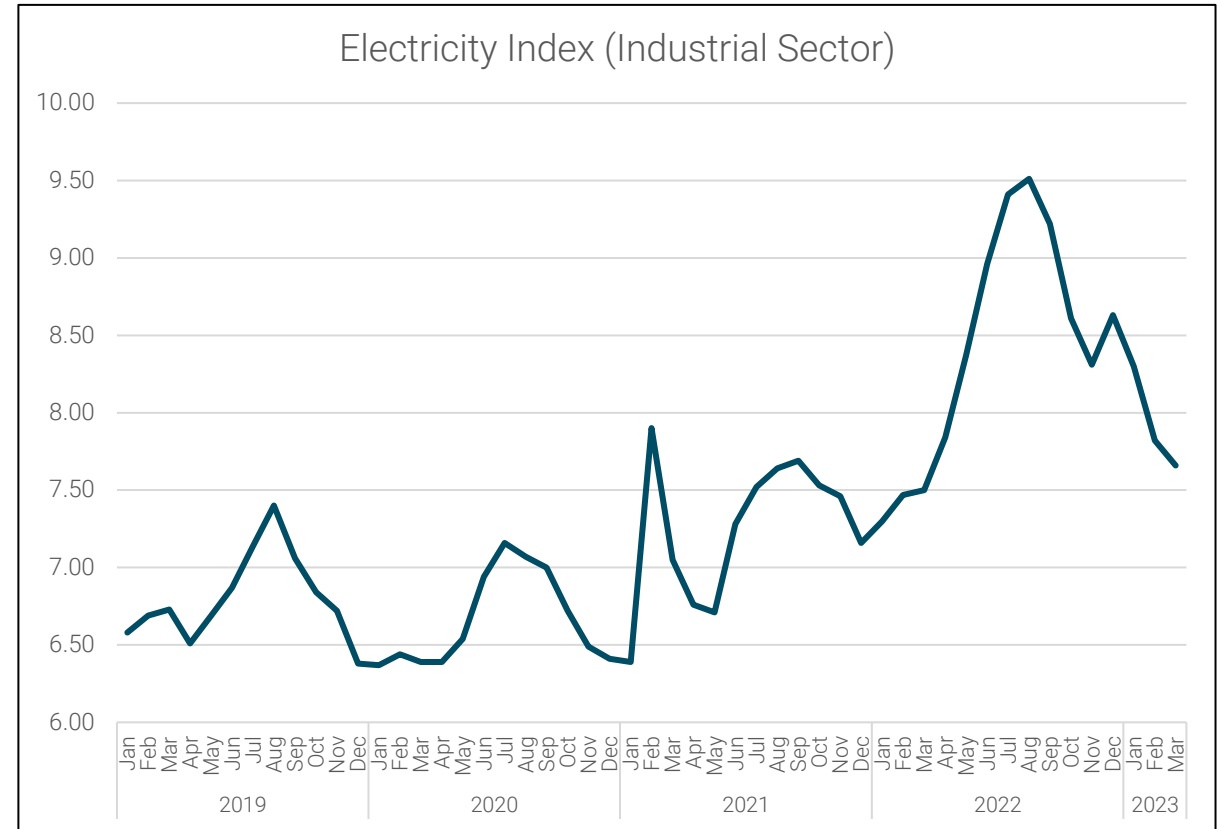


# ENERGY PRICES ARE GOING DOWN, BUT STILL HIGHER THAN PRE-PANDEMIC

**US Natural Gas Price**  
(USD/MCF)

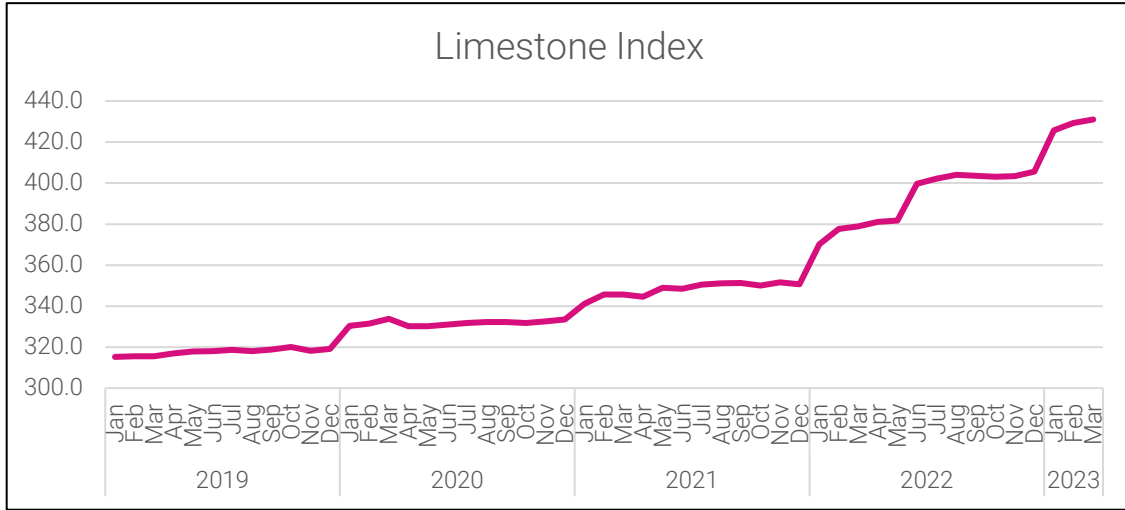


**US Electricity Price**  
(¢ / kWh)

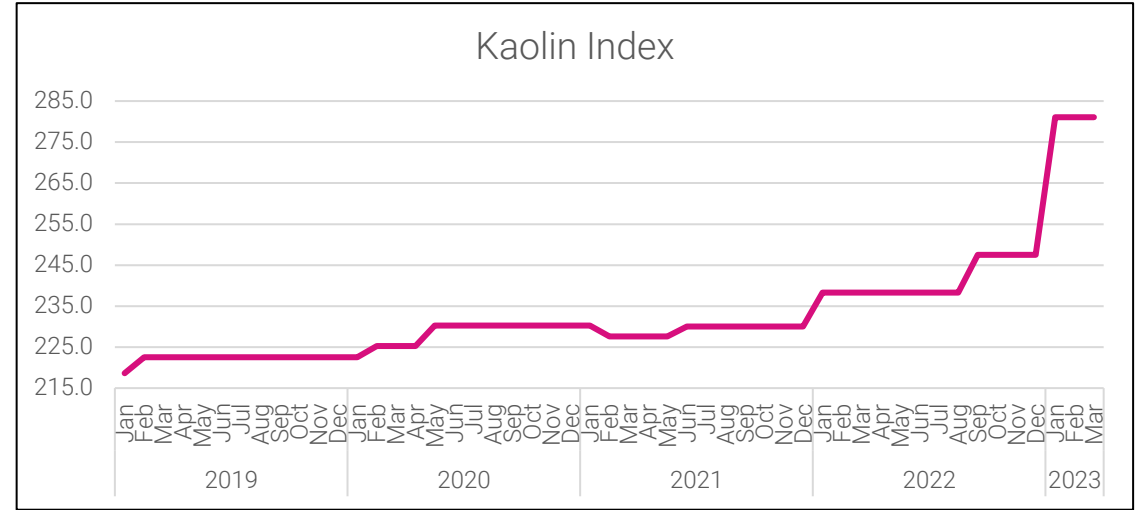


# INFLATION PRESSURE CONTINUES FOR MATERIALS AND LABOR

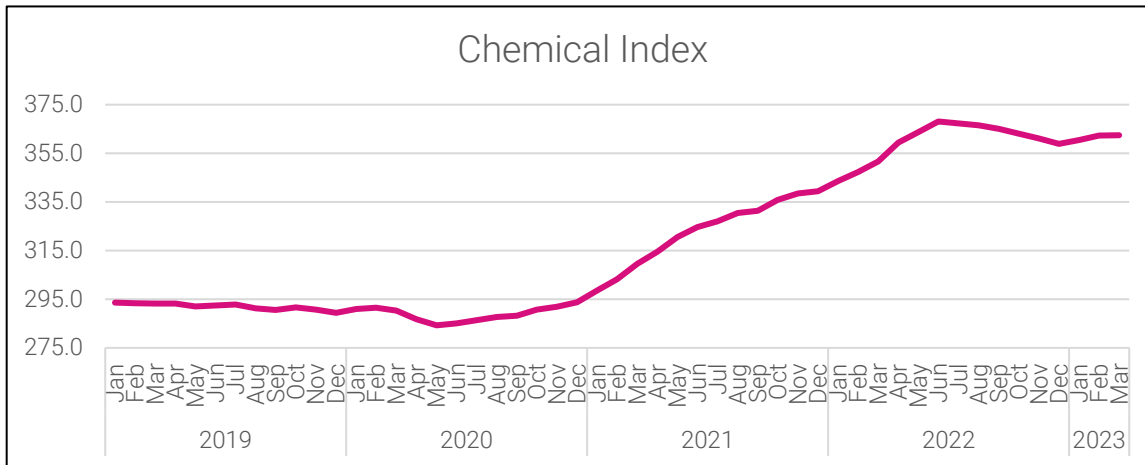
## Limestone (index)



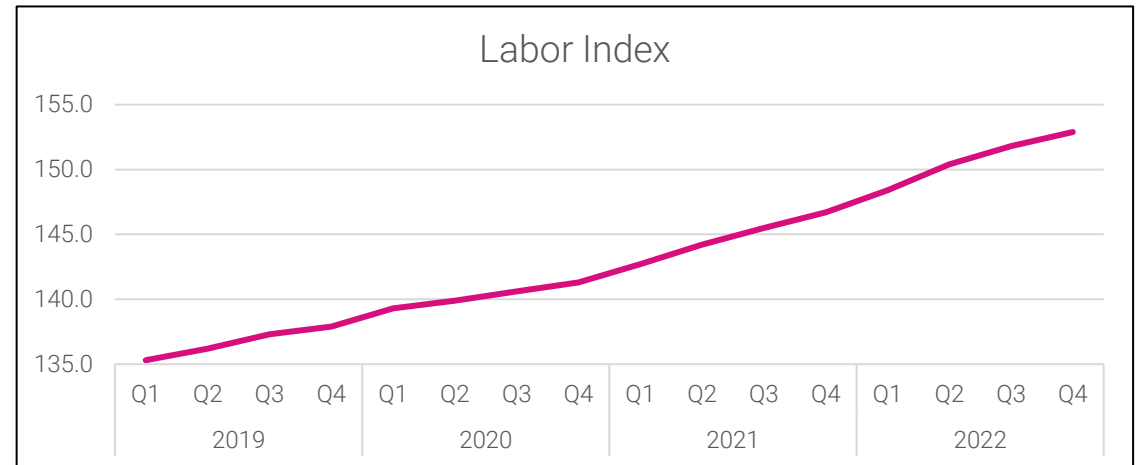
## Kaolin and Ball Clay (index)



## Chemical mfg (index)

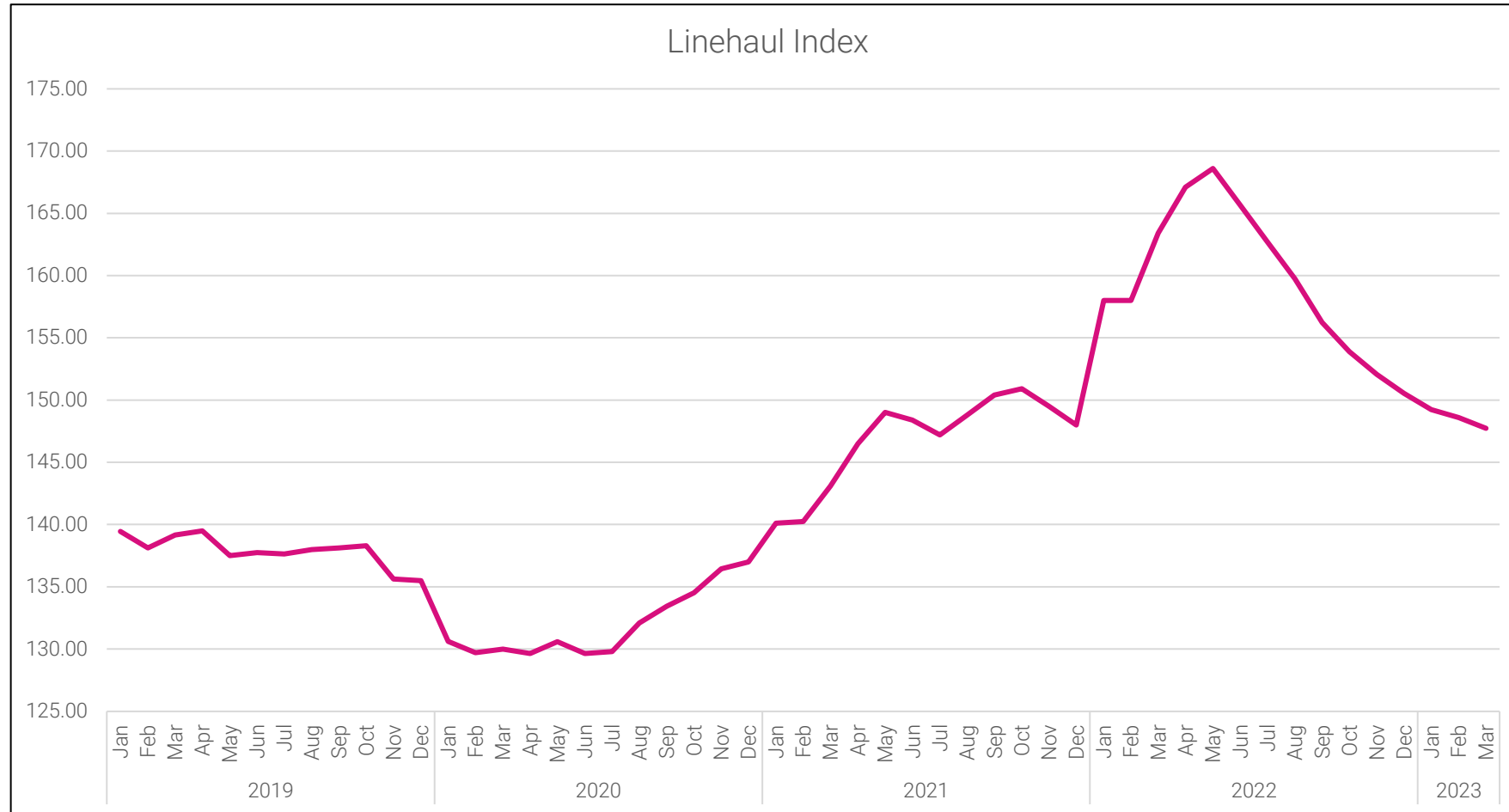


## Labor (index)





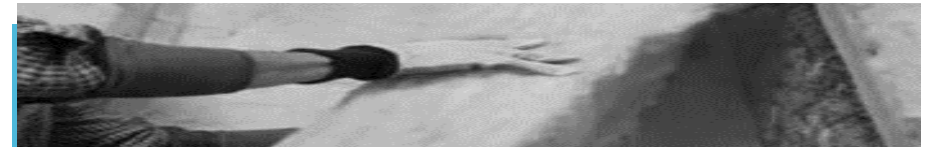
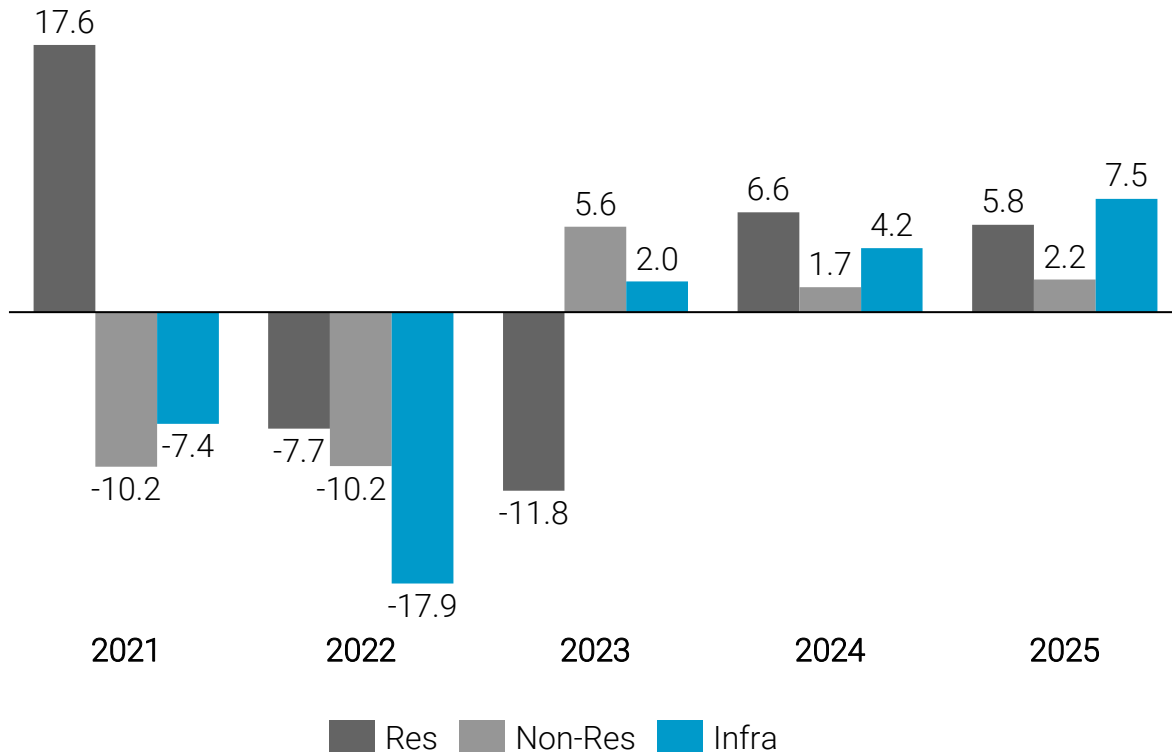
# SIGNIFICANT DECLINE IN FREIGHT, BUT STILL HIGHER THAN PRE-PANDEMIC



# U.S. RESIDENTIAL OUTLOOK SLOWING, BUT IN ABSOLUTE TERMS REMAINS SOLID

Going forward, expect to see Non-Residential pick up sequentially as its recovery has just begun in earnest

US Construction Output  
(% Y/Y)



**US Construction outlook** is above-trend with some differences by construction vertical and job type:

**Residential moderating;** interest rates hurting affordability, but structural underbuilding should put a “floor” on US Residential demand

**Continued improvements to Non-Res outlook,** early 23 census data very strong. New chip plants, anti-climate change spending, plus Boeing contract with Air India

Composites demand in **infrastructure is up 2.6%** in 2022, pointing to very strong **glass conversions**

# THE INFRASTRUCTURE INVESTMENT AND JOBS ACT BECAME LAW IN Q4 2021

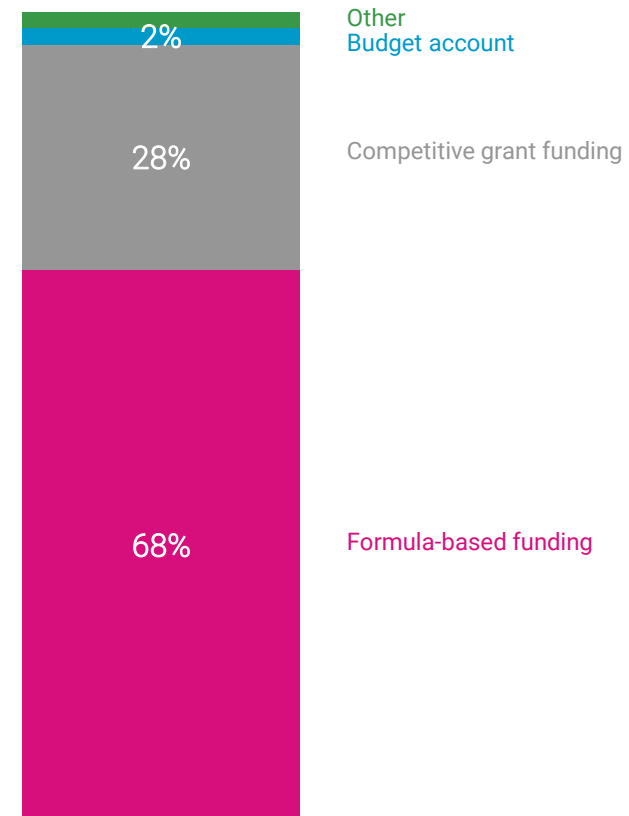
**\$550 BILLION IN NEW SPENDING OVER THE NEXT FIVE YEARS**

## Estimated Allocation of Funds:

**By Infrastructure Category, in \$B<sup>1</sup>**



**By Type, % of Total<sup>2</sup>**



<sup>1</sup>Infrastructure category breakout based on \$550B in new spending. Source: The US Bipartisan Infrastructure Law: Breaking it Down – McKinsey & Company – November 12, 2021.

<sup>2</sup>Agency breakout and funding type is a mix of new and existing funding (totaling to \$773B). Source: The Infrastructure Investment and Jobs Act – Formula and Competitive Funding by Agency – Democratic Policy & Communications Committee.

# NORTH AMERICA: END-USE MARKET OUTLOOK (MAR 2023 UPDATE)

End-Market	2020 Final	2021 Final	2022 Final	2023 (Dec 22 Outlook)	2023 Latest Update	2024 Latest Update	Source	Last Update
Non-Residential	-9%	-10.2%	-10.2%	-2.7%	5.6%	1.7%	Oxford Economics	March
Trailers, RV's, & Parts	-10.5%	11.4%	2.4%	0.0%	-0.7%	1.0%	Oxford Economics	March
Ships & Boats	-5%	13.5%	1.3%	2.3%	-1.2%	6.2%	Oxford Economics	March
Oil & Gas	-55%	65%	10%	2.5%	8%	10%	Capex & Baker Hughes	March
Light Vehicle	-20%	0.2%	9.7%	5.5%	5.5%	4.7%	IHS Markit	March
Heavy Truck	-38%	23%	16.7%	-4.8%	-4.8%	-18.4%	ACT Research Co.	March
Residential	4.5%	17.6%	-7.7%	-7.9%	-11.8%	6.6%	Oxford Economics	March
US Housing Starts MM/year	1.34	1.58	1.61	1.27	1.28	1.45	NSA	March
Infrastructure	-5%	-7.4%	-17.9%	-1.5%	2.0%	4.2%	Oxford Economics	March
US IP	-7.2%	4.9%	3.8%	-2.0%	-1.2%	0.4%	Oxford Economics	March



The economic forecasts herein represent 3rd-party forecasts and do not represent Owens Corning's views. Such forecasts are based on data available at the time the institutions release them and are subject to change. Sources: I.H.S Markit, Oxford Economics, Baker Hughes, Dodge Data & Analytics, ACT Research Co – NA class 8 production, table 14., and publicly available data. Wind is installed GW for all NA and a blend of MAKE & Bloomberg forecast



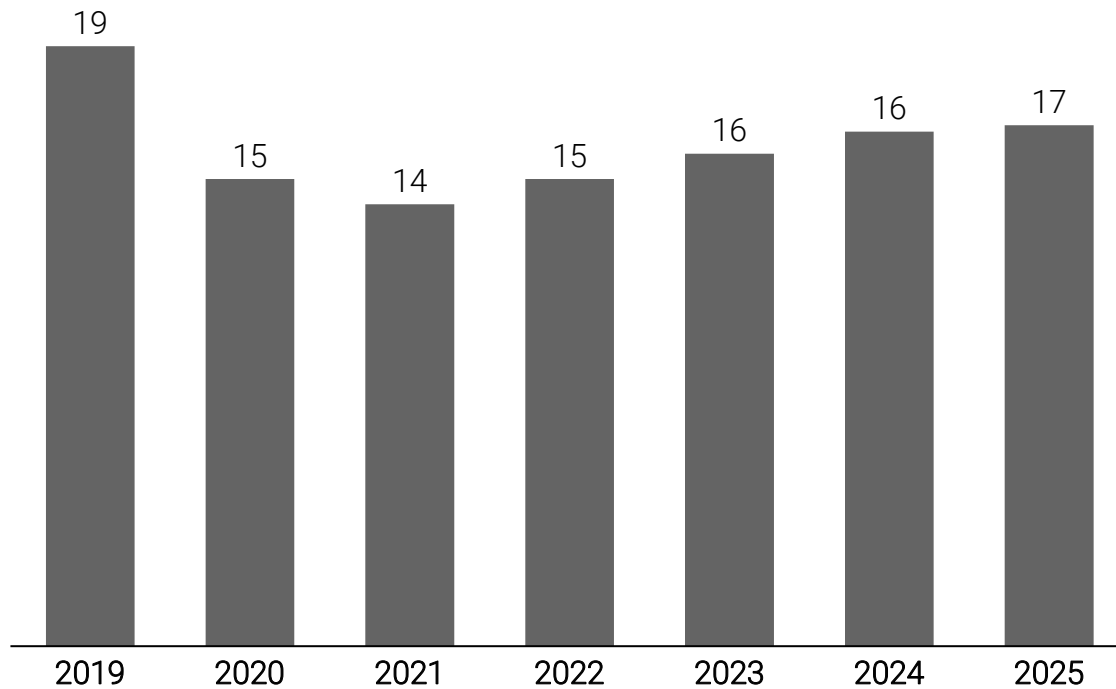
# REGIONAL FOCUS:

**EU**

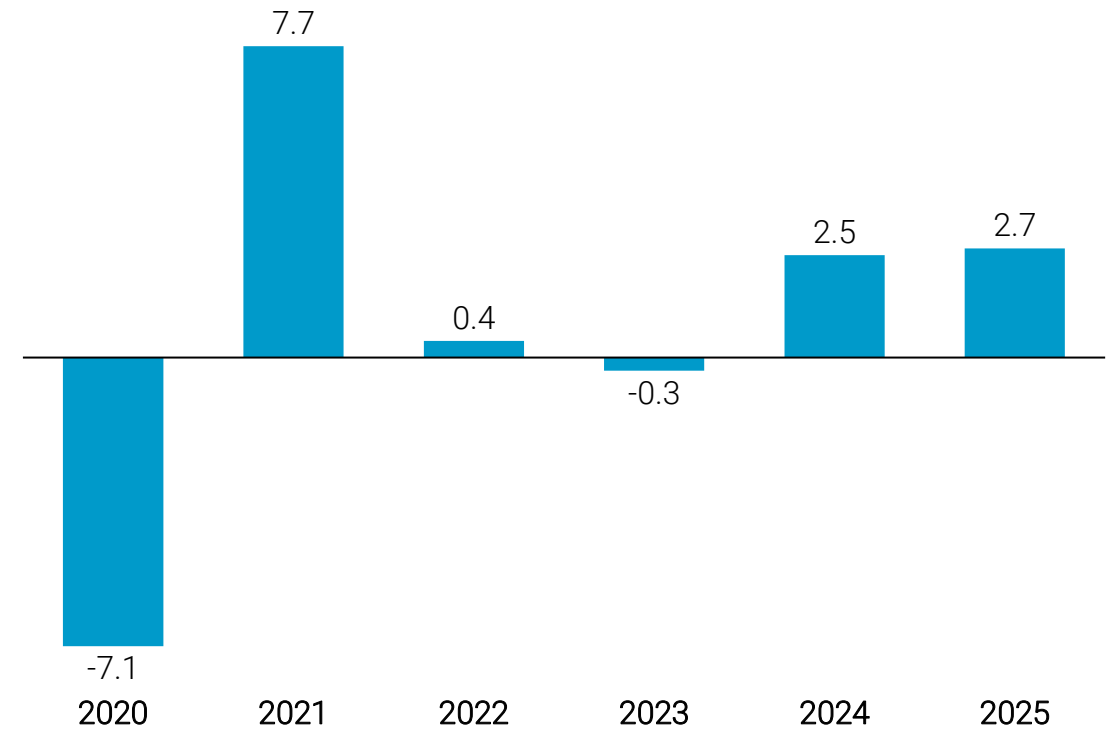
# EU INDUSTRIAL OUTLOOK IS LOW GROWTH, ANTICIPATING REBOUND IN 2024

Supply-side shortages heavily impacting the EU automotive outlook; recovery is expected to be gradual

European Light Vehicle Production (EU+UK)  
(MM Units)



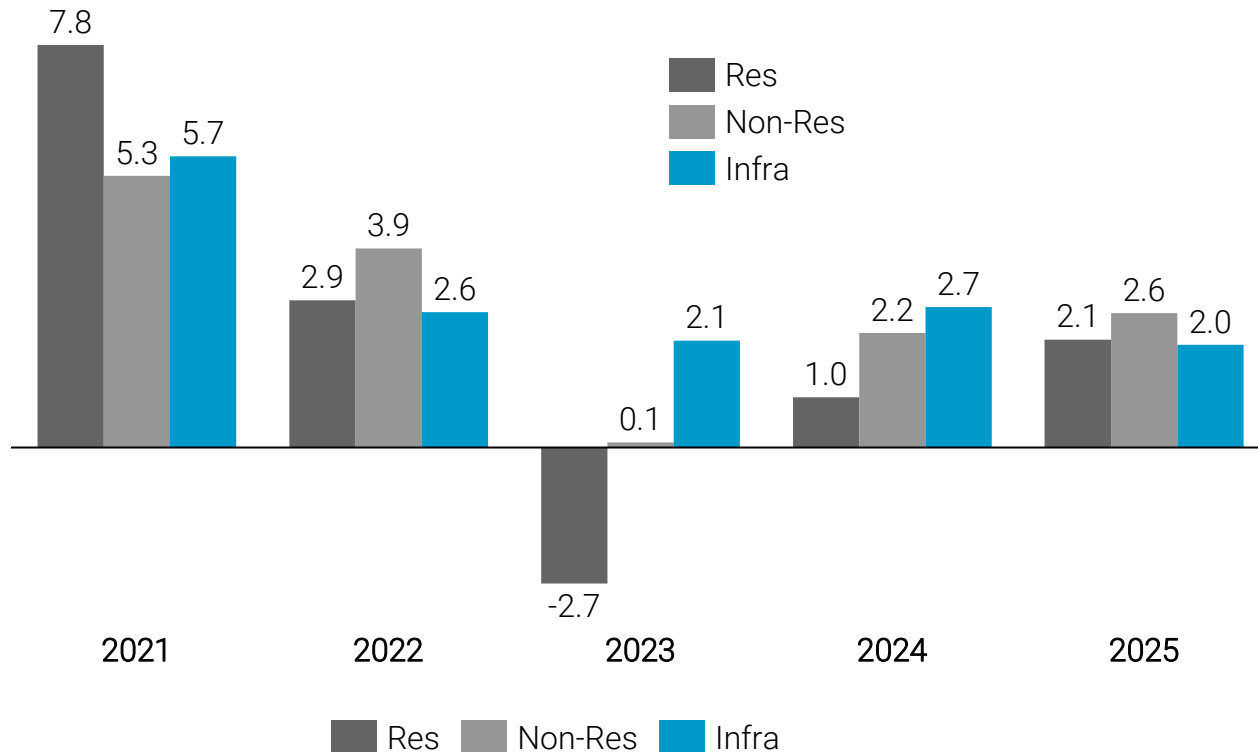
European Industrial Production (EU+UK)  
(Growth, Y/Y%)



# FAVORABLE LONG-TERM OUTLOOK IN EU BUILDING AND CONSTRUCTION

Near-term, heightened uncertainty and more moderated outlook as inflation and rates temper demand

European Construction Output (EU+UK)  
(% Y/Y)



Construction in Europe will continue to be an attractive end-market

Secular tailwind as **energy-efficiency, sustainability and the EU Renovation Wave** drive long-term growth

Near-term uncertainty and more moderated demand outlook driven by inflationary pressure, rising rates

# EU SUSTAINABILITY TRENDS: HOW TO PREPARE AS THE COMPOSITES INDUSTRY ?

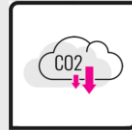
Legislation moves from Plastic Packaging to all Plastics. And from all Plastics to other materials.



## CIRCULARITY

Recyclability as a prerequisite for future markets

- Further restrictions and increasing costs on **waste to landfill**
- Circularity legislation affects our industries **Automotive & Transportation**  
**Electronics & Building & Construction.**
- Waste Framework Directive, Waste Shipment Regulation, End of Waste criteria in development



## DECARBONIZATION

Carbon footprint as differentiator

- **Energy efficiency and decarbonization:** Scope 1 and 2 GHG reductions, Industrial emissions, ETS
- **Sustainable supply chains** based on **green energy** (REPowerEU, Green Deal Industry Plan). Scope 3 reductions driven by Science based targets



## SUSTAINABILITY BY DESIGN

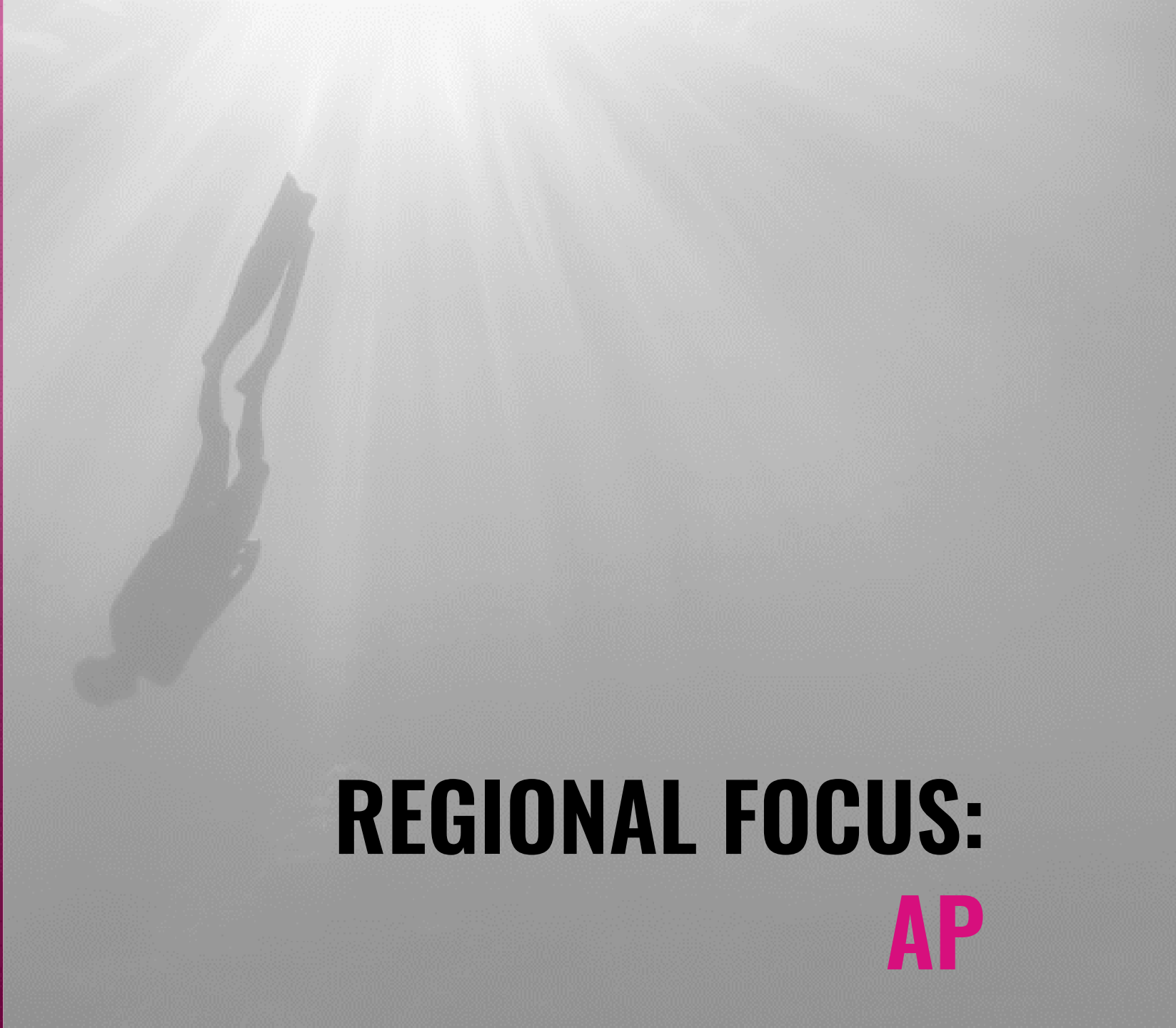
Overall shift for chemicals from risk to hazard based

- Chemical Strategy for Sustainability.
- Review of products specific legislation based on transparency requirements, **safety and sustainability by-design**
- Phase out of hazardous substances (REACH) in composite products.



**Create alliances for common solutions within the composites industry**



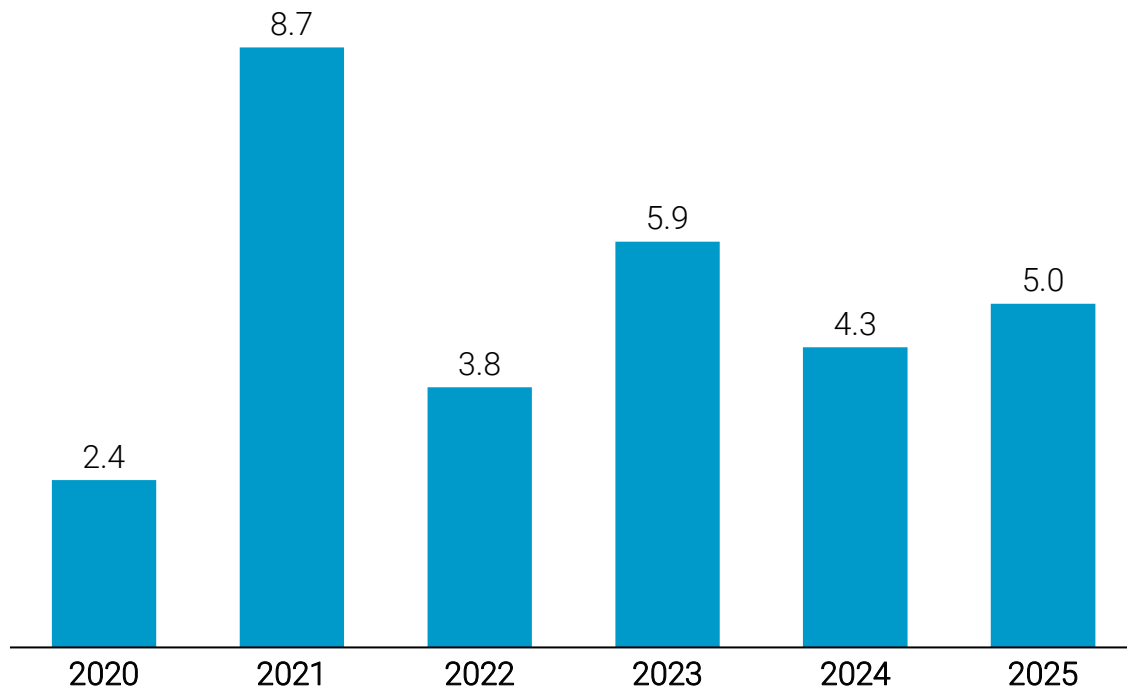


# REGIONAL FOCUS:

AP

# CHINA INDUSTRIAL OUTLOOK BOUNCES BACK IN '23 AND LEADS GLOBAL GROWTH

## China Industrial Production (% Y/Y)



## China Light Vehicle Production (MM Units)

