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Auto Industry Update

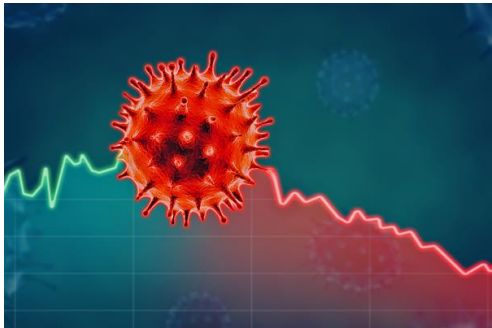
ECG Spring Congress, Thessaloniki

12 May 2023

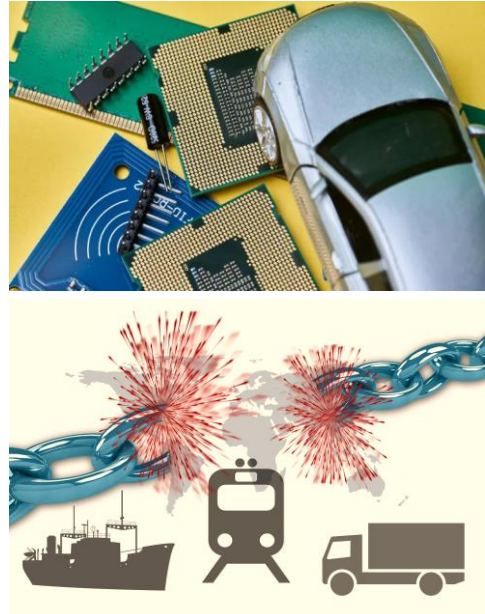
Justin Cox, Director, Global Production



A world of uncertainty!



2020



2021



2022



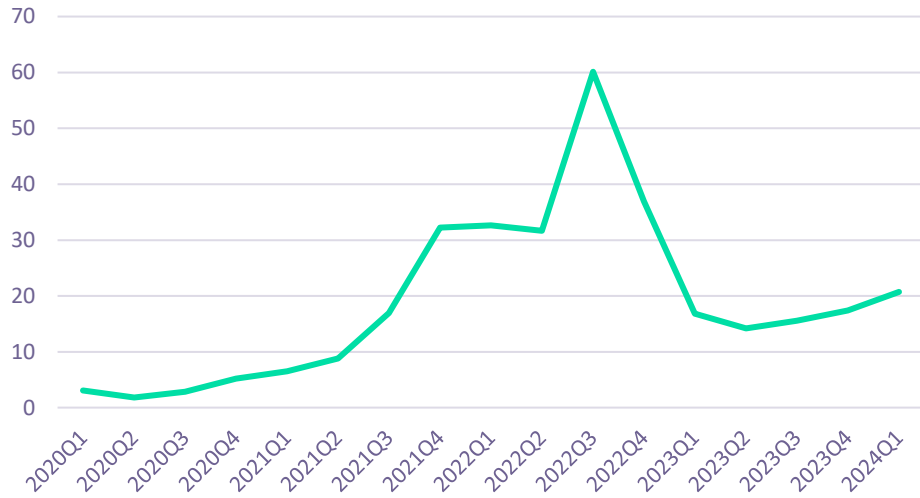
2023

Layered disruptors negatively impacted path of recovery, but has it led to demand destruction?

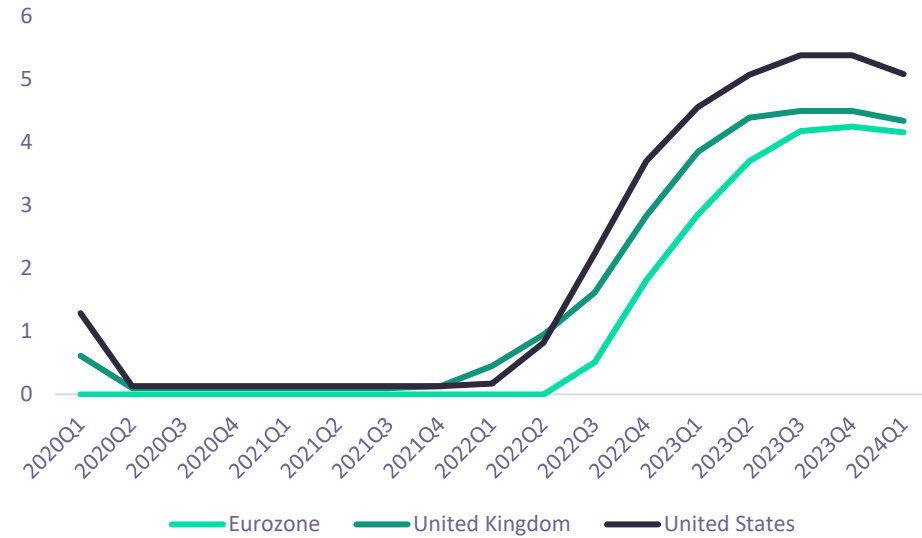
Economic Indicators



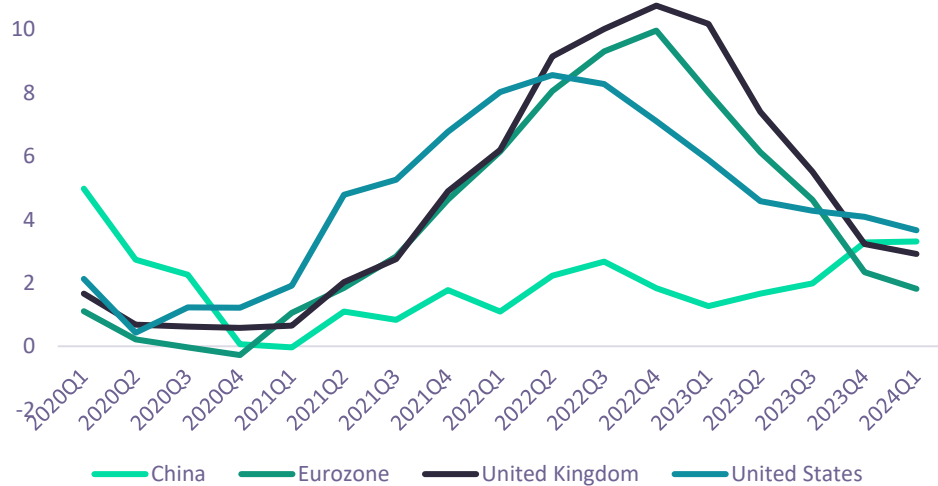
European Gas Prices (US\$/Mil.BTU)



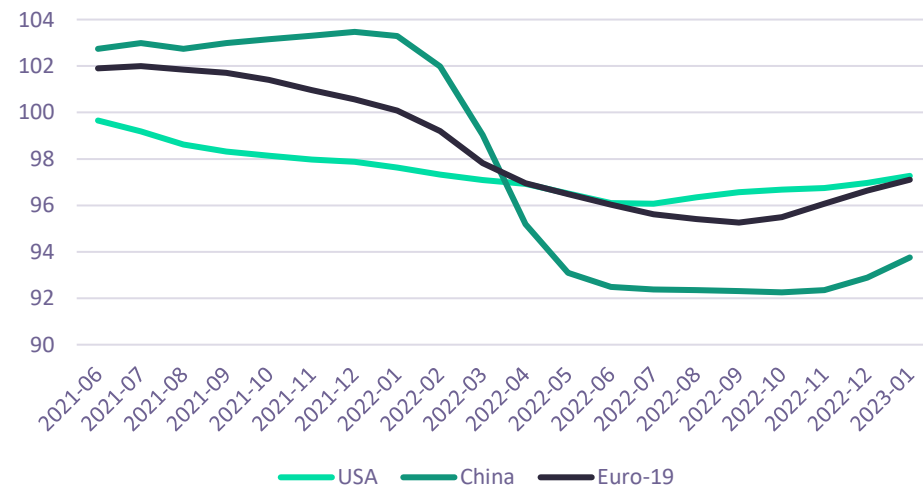
Central Bank Interest Rates (%)



Inflation (q/q%)



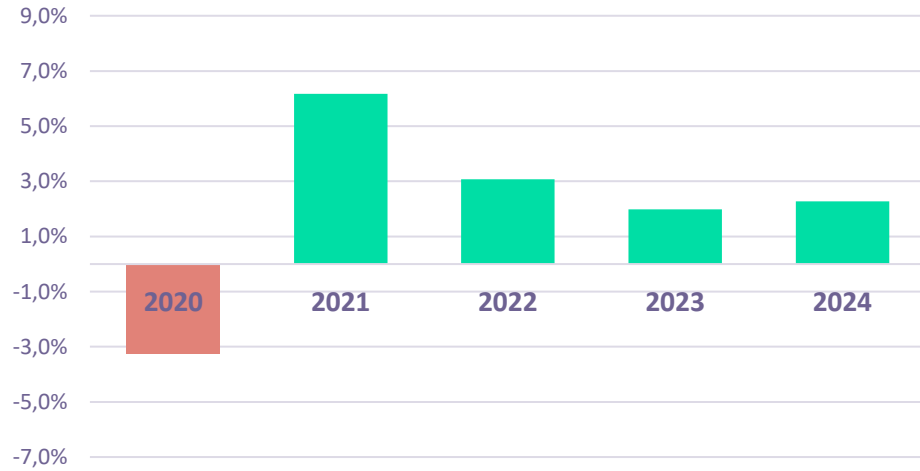
Consumer Confidence



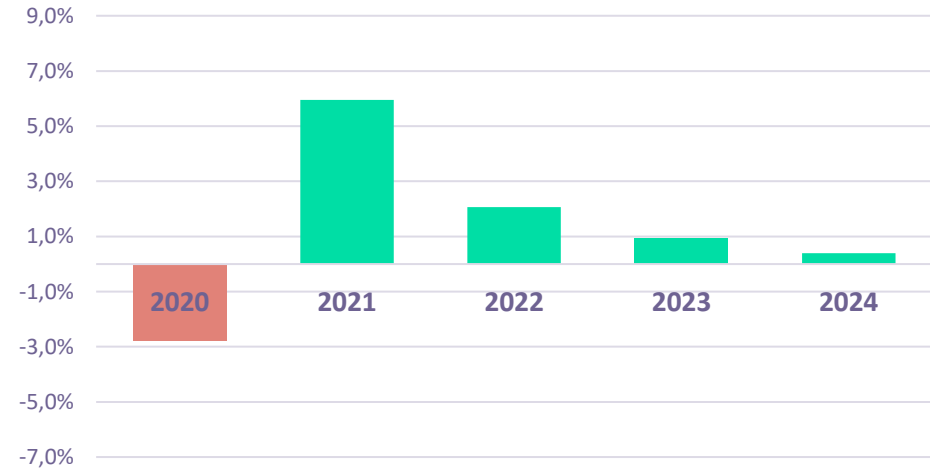
Annual GDP growth expectations improve but still high risk in Eurozone and US



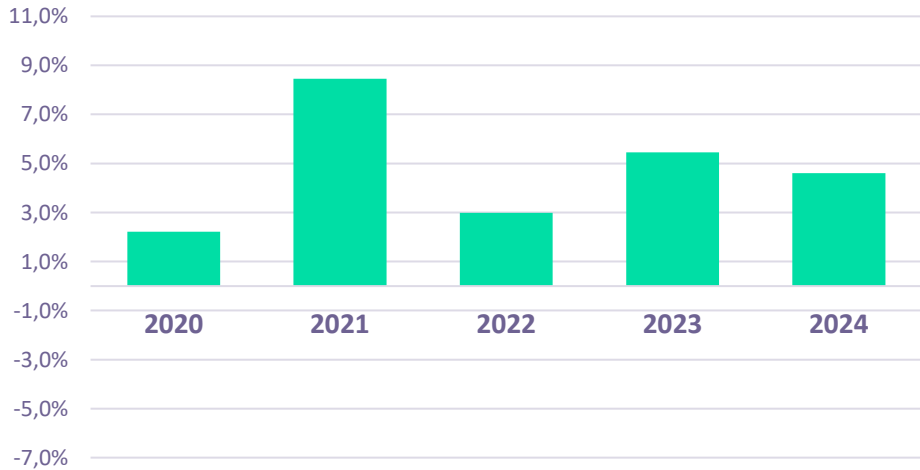
Global



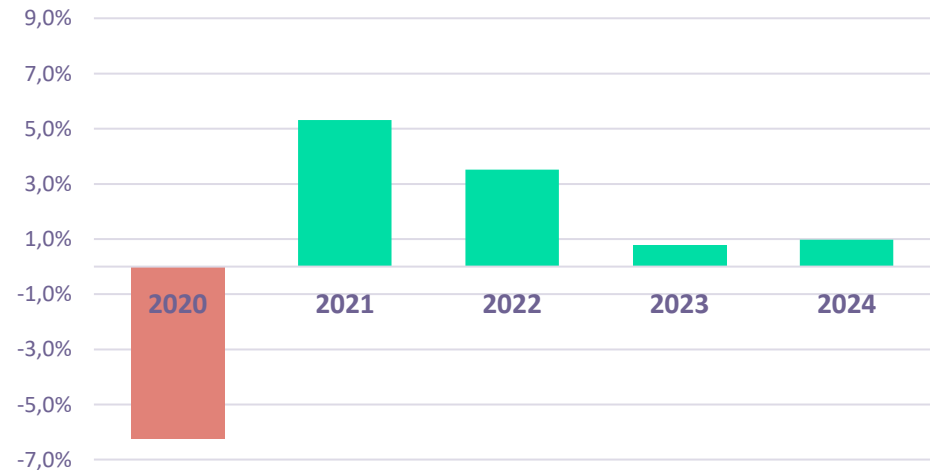
USA



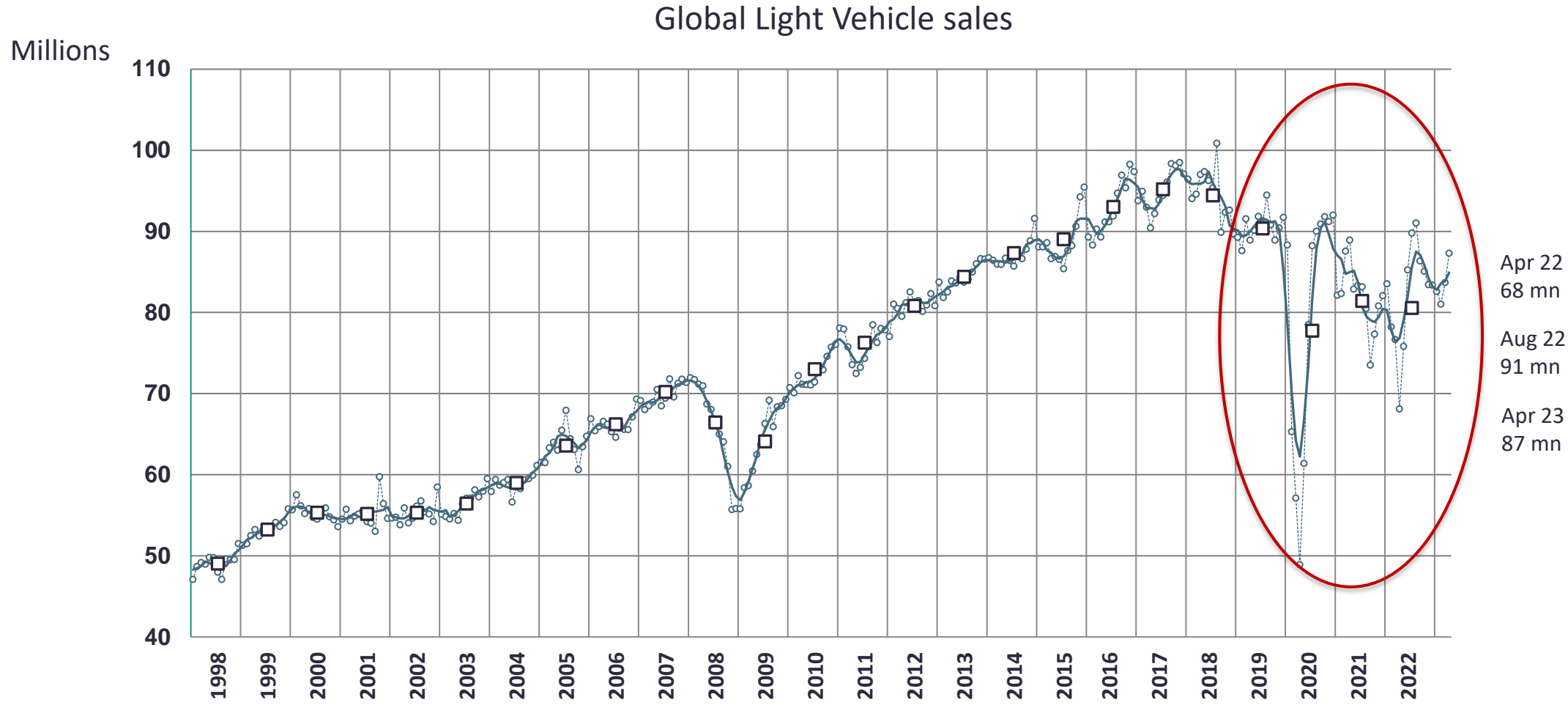
China



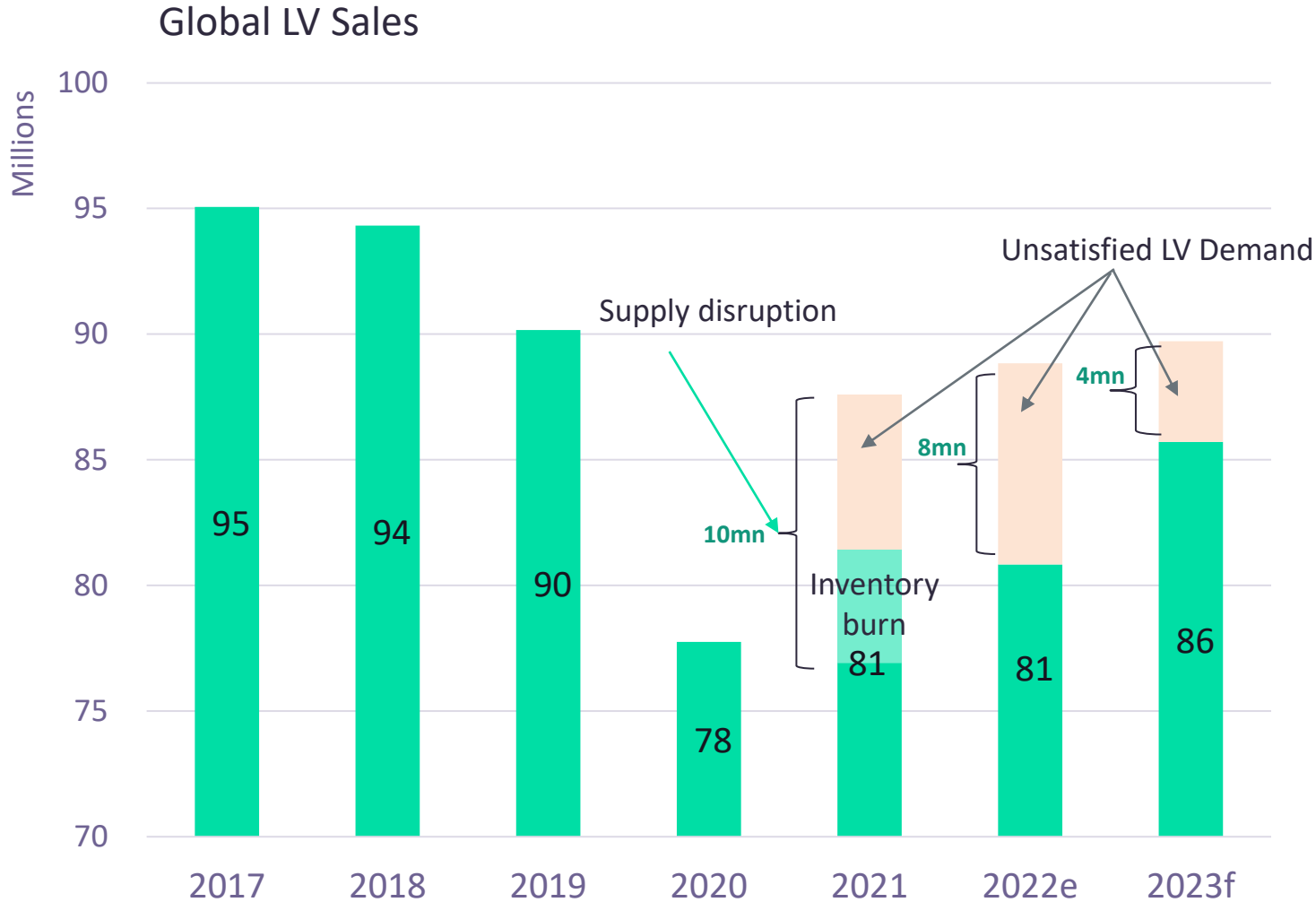
Eurozone



Global Light Vehicle recovery ebbs and flows

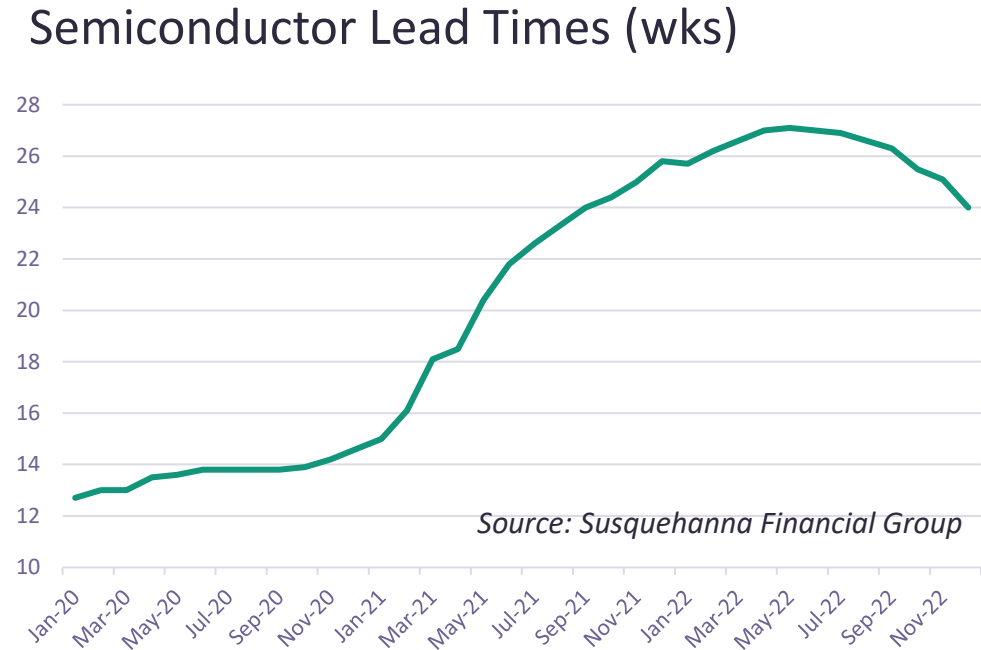
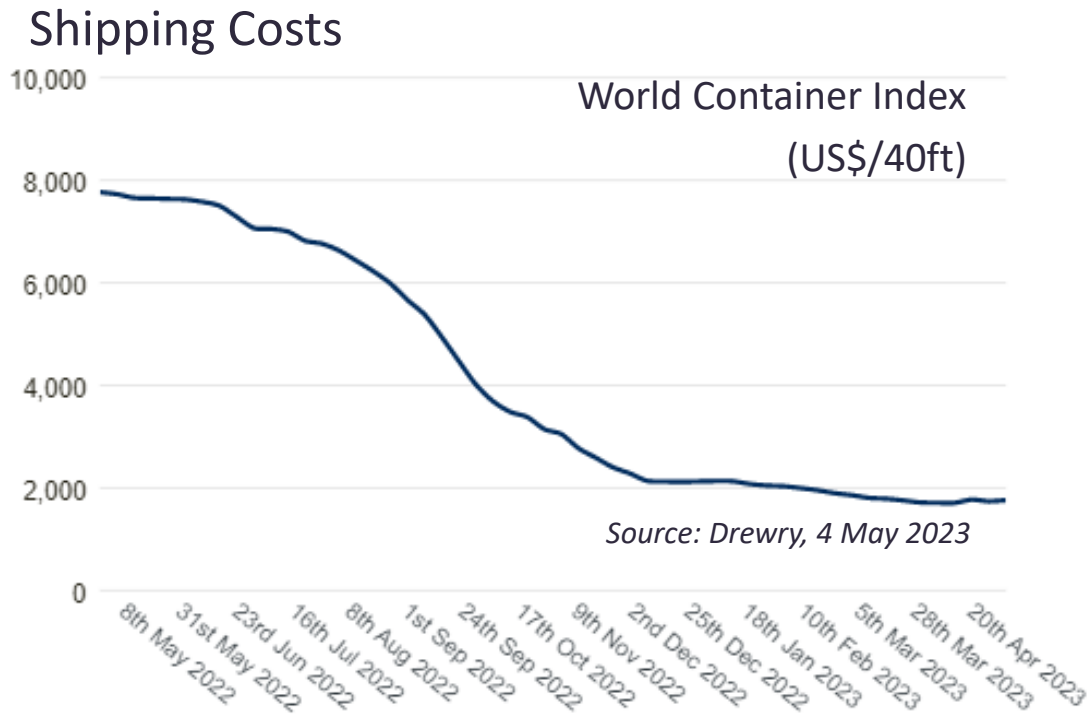


Global LV Demand: Structural gap



- Without the LV inventory cushion, 2021 global LV sales would have been closer to 2020 outturn.
- Full-year underlying LV demand is estimated to be over 8mn above 2022 sales
- Backlogs and Chinese LV market pricing support help offset economic downturn impact in 2023.
- But structural gap between demand and supply is expected to endure in 2023.
- Globally, supply-side constraints and model-mix affordability continue to leave underlying LV demand unsatisfied.

Global Disruption – Relief?



- Supply chains remain fragile but their functioning has reportedly improved since the peak of disruption in Q3 2021.
- Logistics costs have also eased from last year's peak but still remain above pre-pandemic levels.
- Semiconductors lead times remain high. However, better supply management, falling competition for chip capacity and some supply transfers from Russia have supported better chip supplies outlook for the auto industry.
- Ukraine War intensifies raw material and energy price volatility. Recent fears of economic slowdown, particularly in China, have helped push commodity prices down from peaks. Potential longer-term supply deficits sustain high prices of Lithium for EVs.

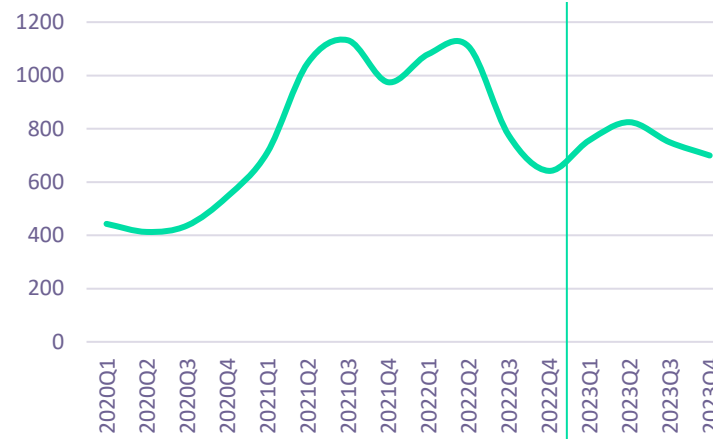
Commodities



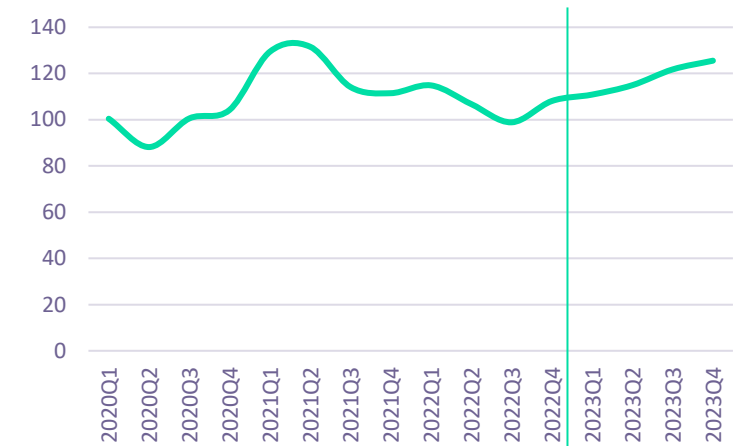
Natural Gas (Index 2005=100)



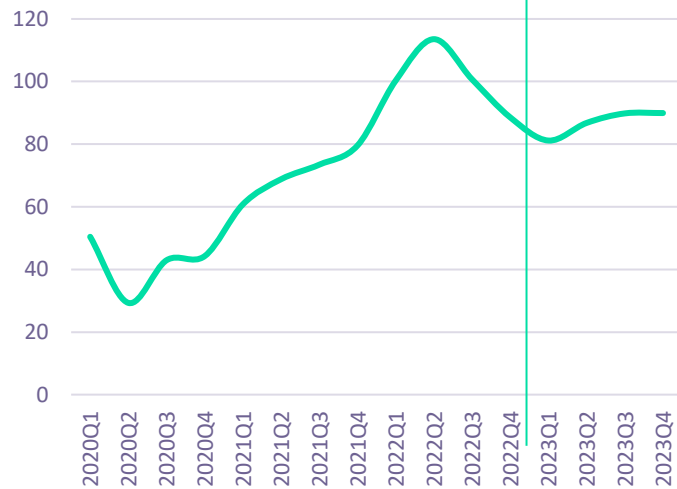
Steel HRC (Euro per ton)



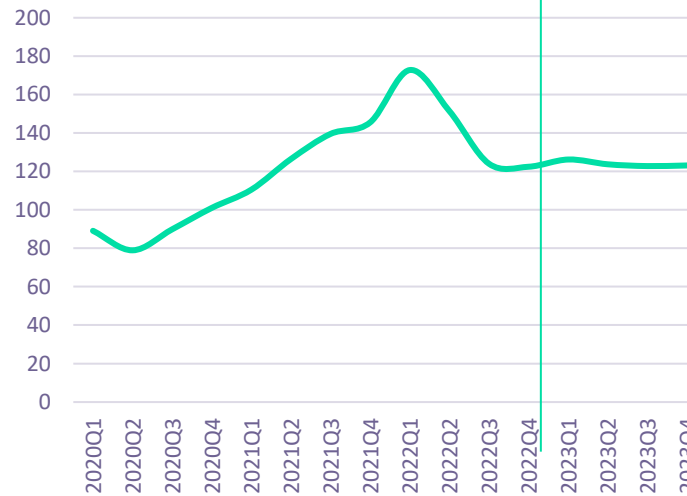
Platinum (Index 2005=100)



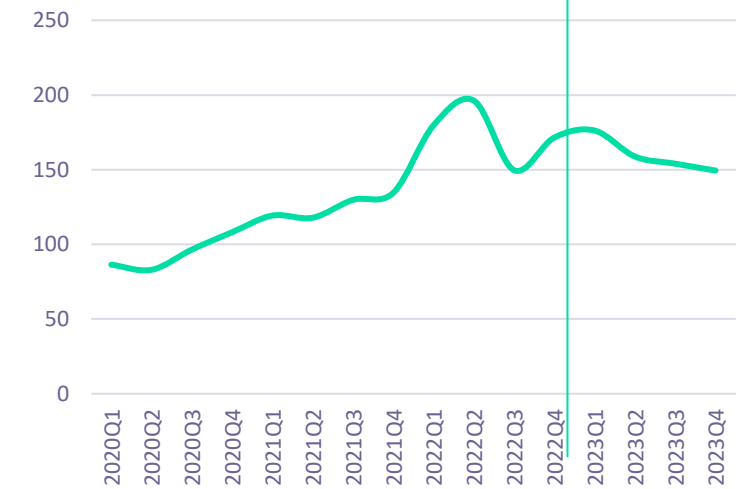
Oil (Brent US\$ per brl)



Aluminium (Index 2005=100)

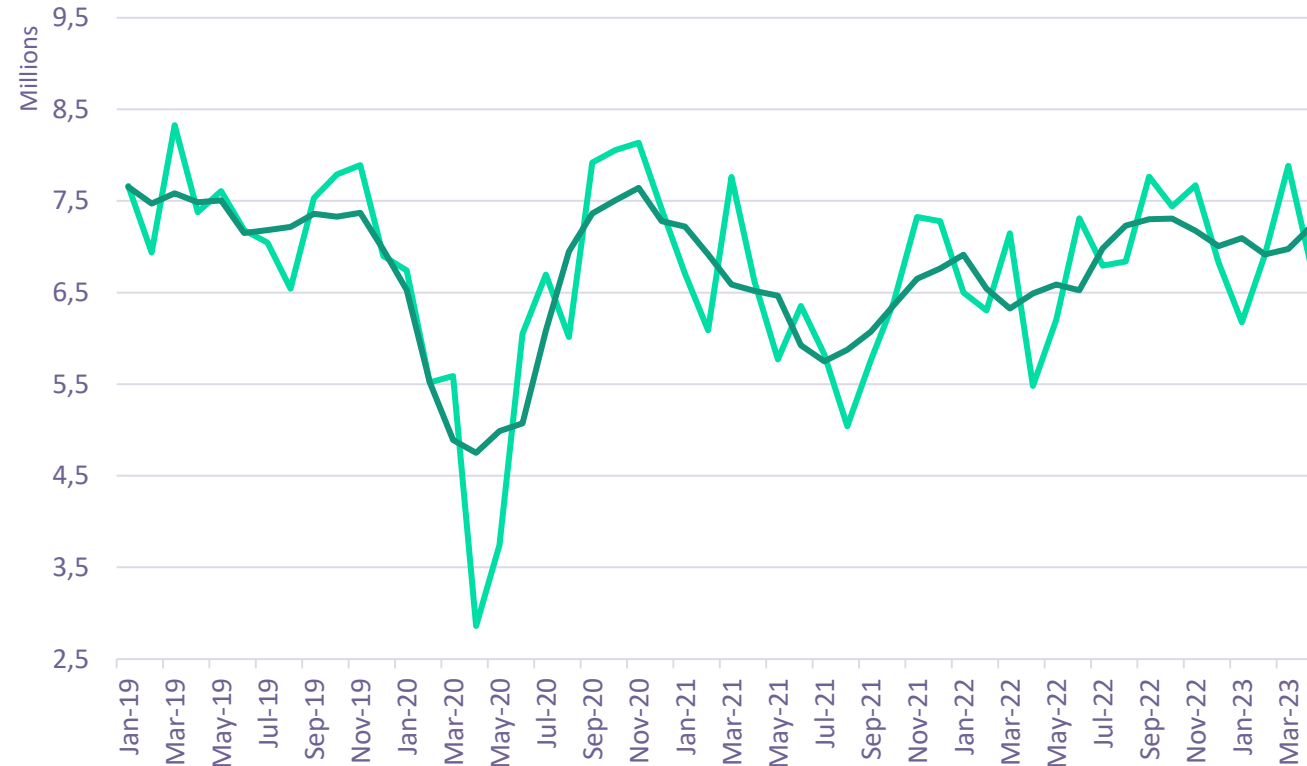


Nickel (Index 2005=100)





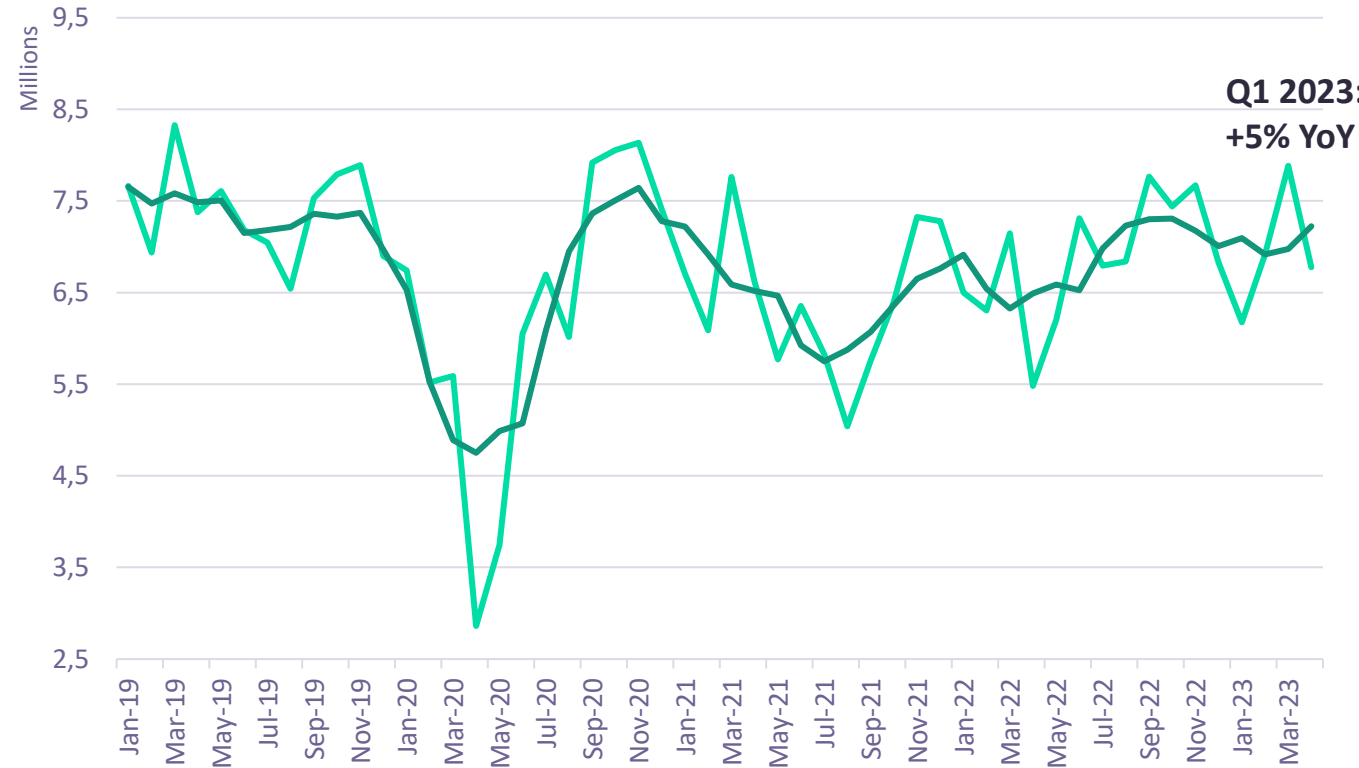
Monthly LV production with trend



- Global LV production volumes have firmed in recent months, defying the weaker macro economic backdrop.
- Q4 2022 LV output grew by over 4% YoY, and Q1 2023 is estimated to have grown by over 5% YoY.
- However, supply-side disruption still continues to hamper LV output.

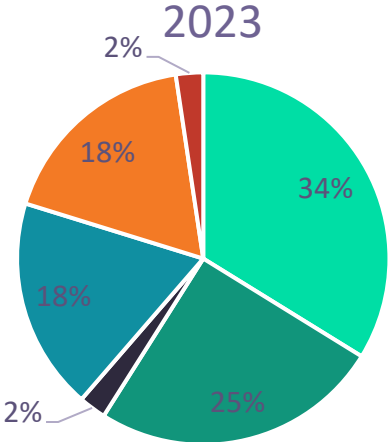
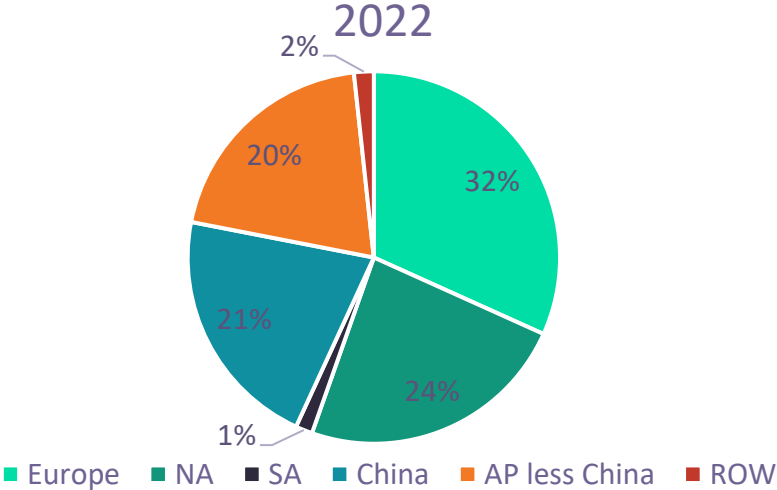
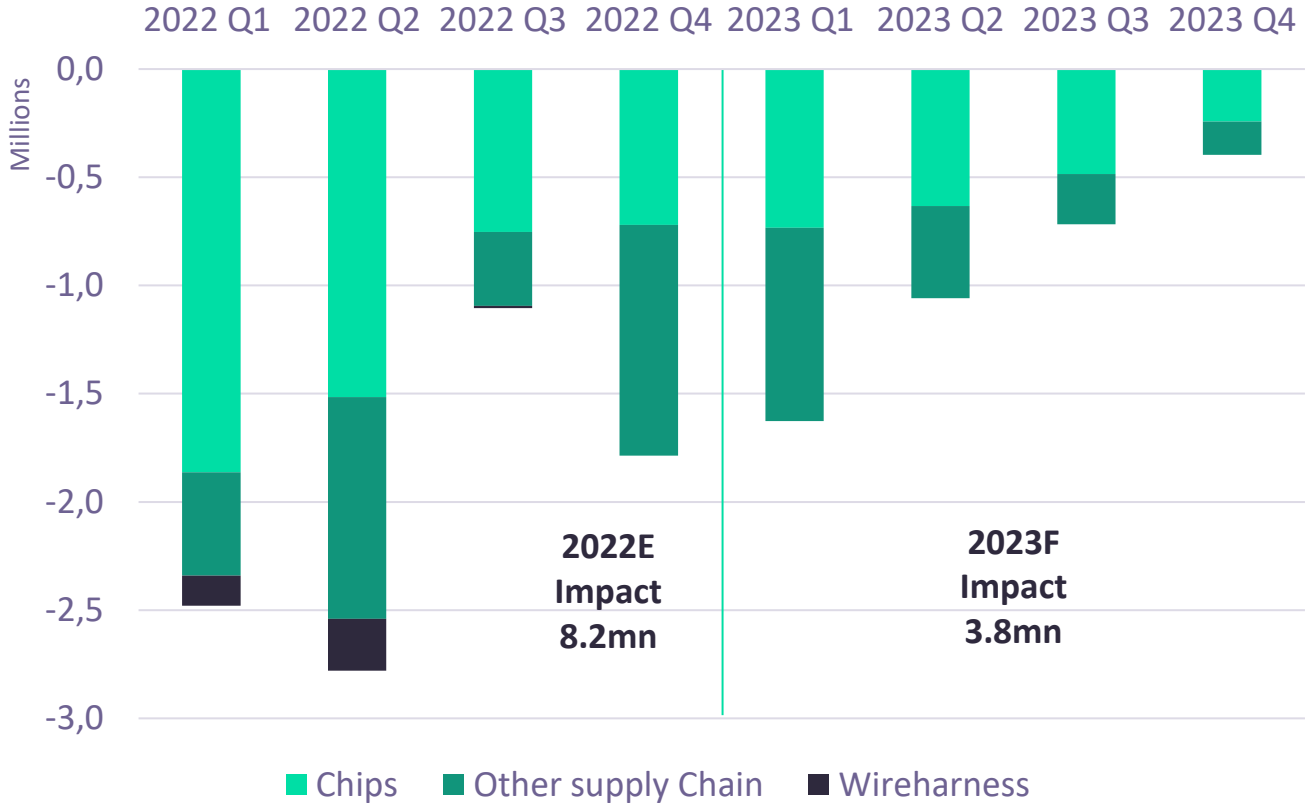


Monthly LV production with trend



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Global LV output disruption – improving picture continues

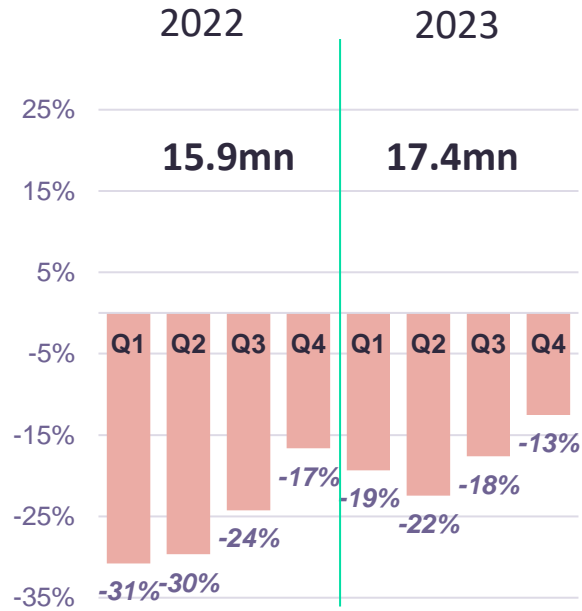


Near-Term LV Production Forecast : Key Regions

Note: all growth rates measured against 2019 volumes



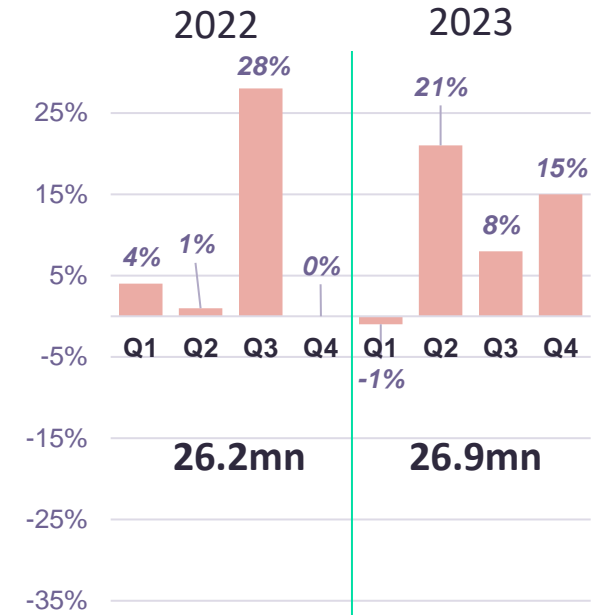
Pan Europe



North America



China



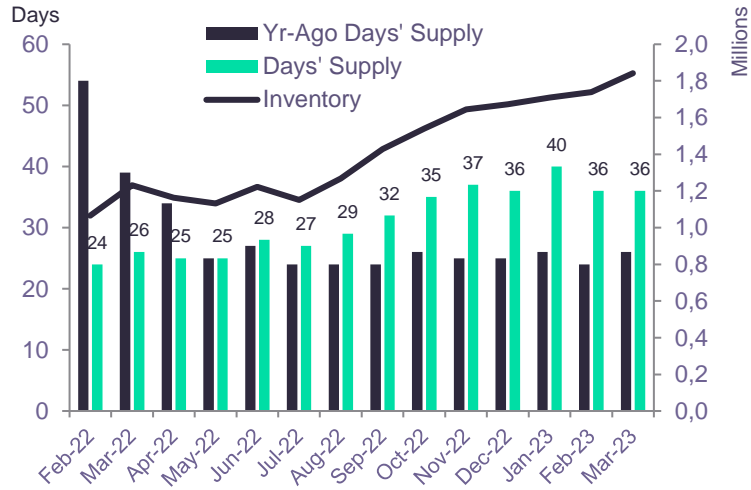
- Russia-Ukraine related component disruption. Russian output slump.
- Lingering chip shortage but improving
- Risk balanced in 2023 but 1Q is stronger than expectations
- 2023: +10% yoy

- 2023 outlook has been increased since beginning of year
- Output beginning to catch demand given pricing but incentives could have impact
- Material shortages improving.
- 2023: +7% yoy

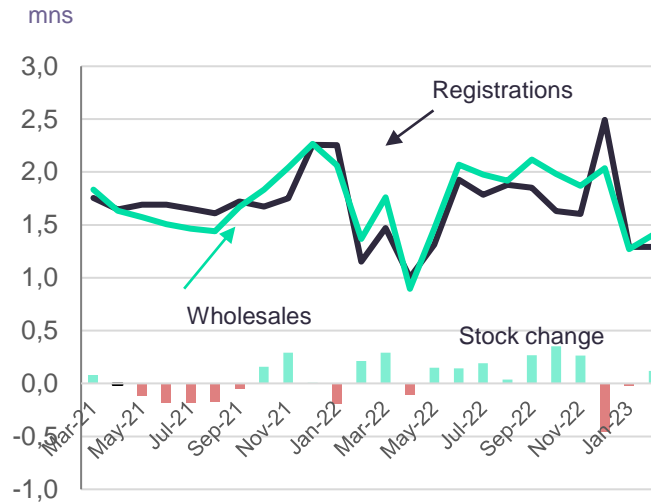
- 2022: COVID policy has shaped the outcome
- COVID impacted early Q1 but China restart and some consumers buying ahead of some expirations of incentives drove a rebound in March
- 2023: +3% yoy



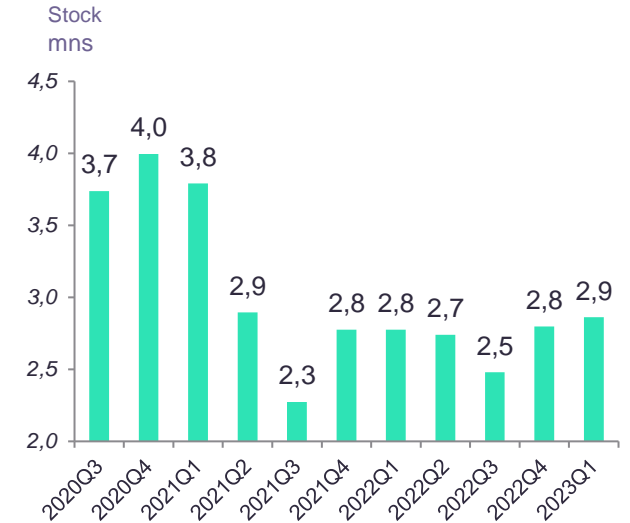
US LV Days' Supply



China : Stock Change



Europe LV Inventory

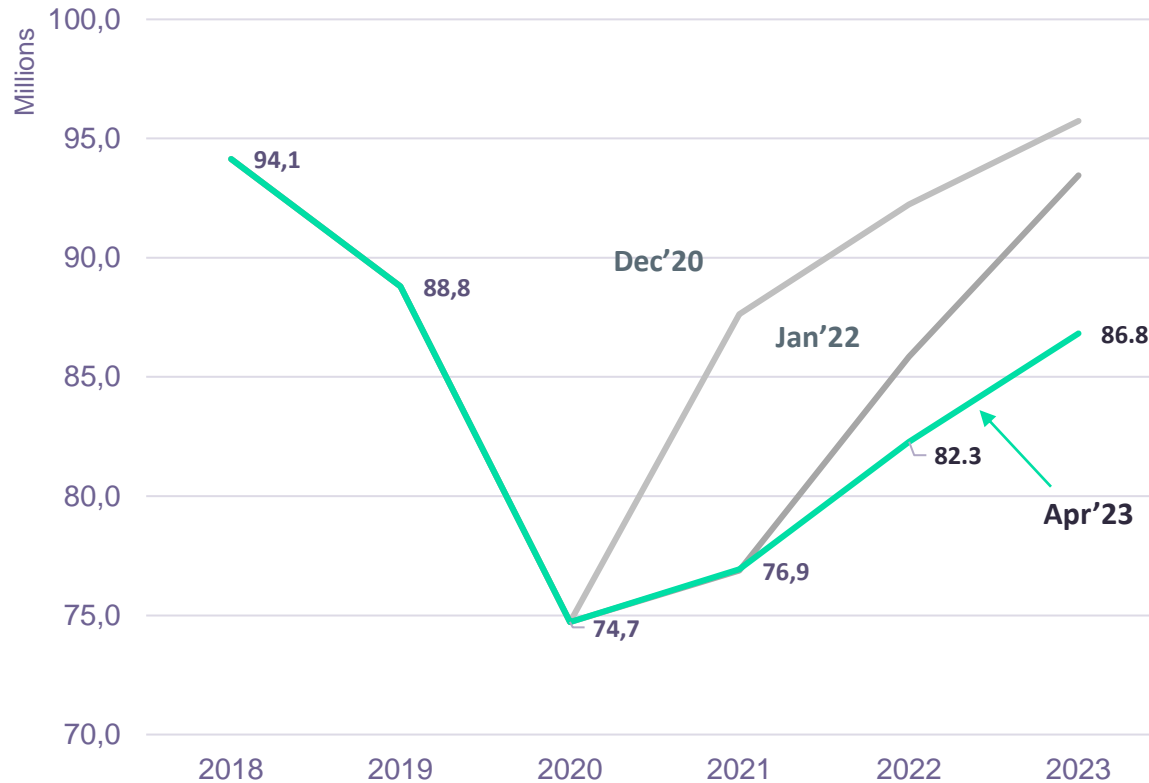


- US Light Vehicle Inventory continued to increase through Q1 marking the eight straight MoM gain due to parts supply improvement. However, “normal” days’ supply of 60-65 days’ supply are unlikely to return.
- China’s change in stock has been negative in 8 of 12 months in 2021. However, the post COVID lockdown rebound has seen signs of more sustainable stock growth. COVID surge at the end of 2022 drove stocks down, but they have started to rebound again in February.
- Europe: ‘security’ stock-built in Q4 ’20, but since then, stock levels have fallen by 25%. Some signs of improvement in Q4 2021 and through 2022 but absolute levels still well below normal.

Near-Term LV Production Forecast - Global



Forecast Evolution



- Forecast has shifted from a 'V' shape to 'U' shaped recovery
- Measured against our Jan'22 forecast, the global full-year 2022 outturn was cut by 3.6mn and the 2023 view has been cut by 6.7mn.
- Cuts to forecast reflect impacts from war, COVID, input cost pressures, weaker macro economic outlook and affordability of the available model-mix.
- Longer term, the downgraded demand environment will be reflected in associated cuts to the outlook.
- Vehicle affordability: OEM pursuit of margin over volume, cost of technological change
- Distribution strategy shift to reduce longer-run inventory requirements.
- Changes to mobility demand through altered working/commuting patterns.

OEM Medium-Term 'Score-card'



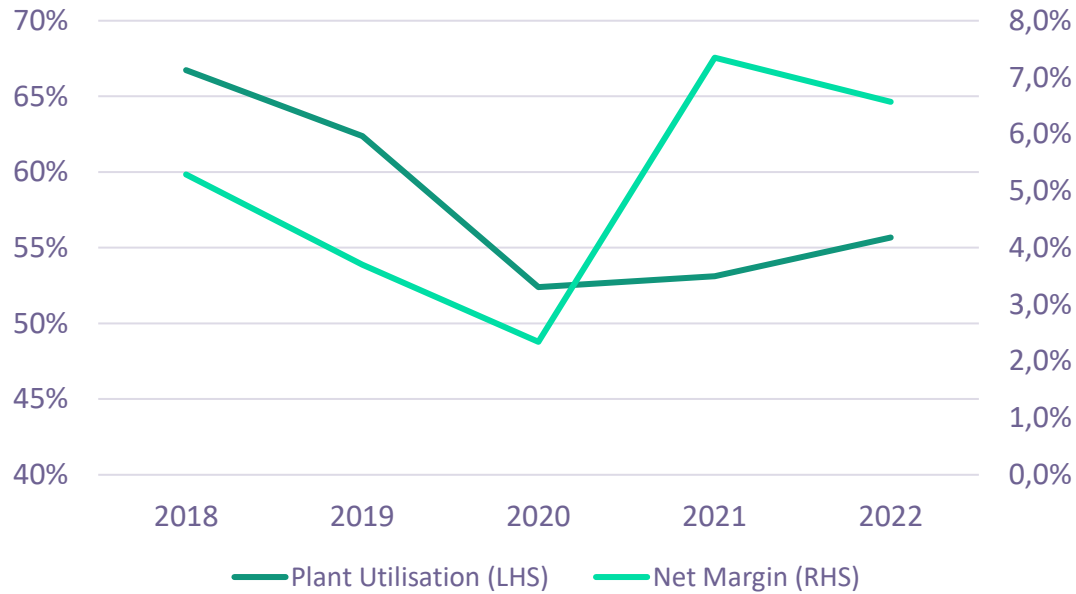
Global LV Production by Key Groups: 2019 = 100

	2020	2021	2022	2023	2024	2025	2026
<i>All Global Total</i>	84	87	93	98	101	105	108
<i>Toyota Grp</i>	87	95	100	101	102	107	108
<i>VW Grp</i>	82	77	80	80	81	86	89
<i>RNM</i>	71	72	69	75	77	81	85
<i>Hyundai Grp</i>	84	88	94	95	99	103	105
<i>Stellantis</i>	79	82	83	91	98	102	106
<i>GM</i>	83	72	83	85	86	86	84
<i>Honda</i>	85	79	76	78	81	81	82
<i>Ford</i>	75	71	78	81	80	83	83
<i>Suzuki</i>	84	96	108	104	106	107	108
<i>SAIC Grp</i>	96	111	108	102	110	112	114
<i>BMW Grp</i>	88	96	93	104	104	104	107
<i>Mercedes-Benz Grp</i>	86	83	88	96	96	97	95
<i>Geely Grp</i>	94	96	104	110	126	130	136
<i>Tesla</i>	140	254	375	489	532	593	670
<i>JLR</i>	74	71	67	77	76	87	85

Global LV Production 'Mix' Impact

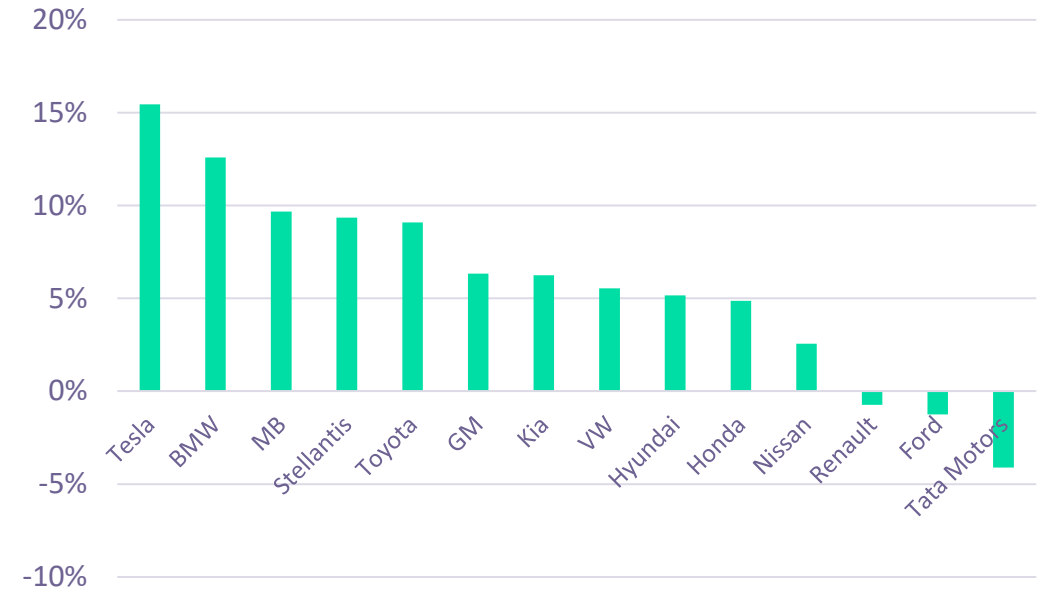


Global Utilisation & Global OEM Net Margin*



Source: LMC Automotive, Global Data, *top 25 by revenue

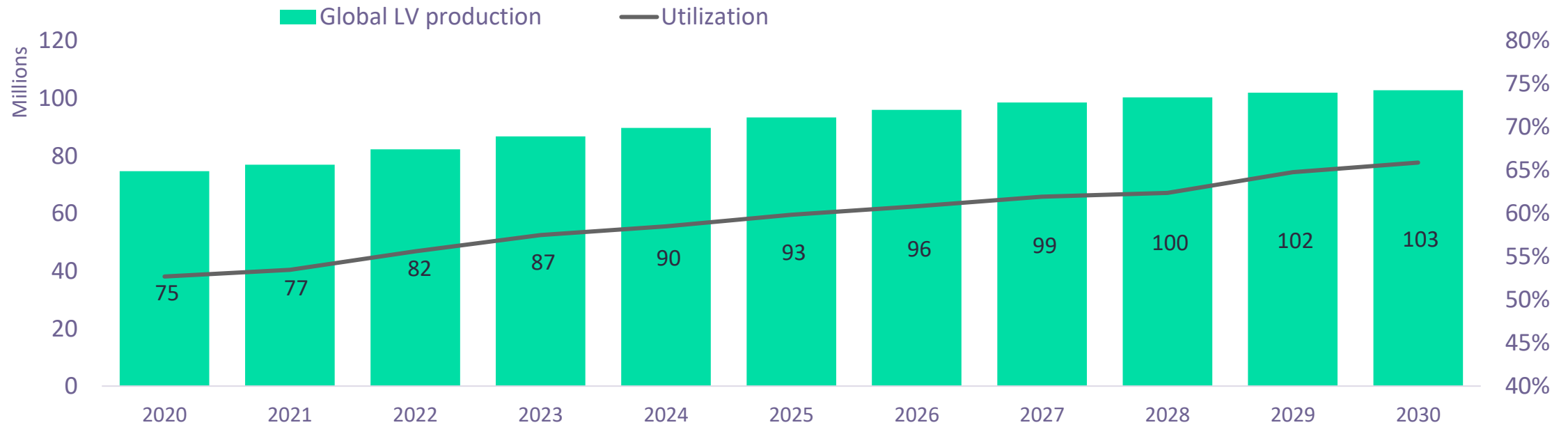
Net Margin 2022: Selected OEMs



Source: Global Data, Company reports

- Focus on higher-margin product has dramatically improved industry margins,
- While Global assembly plant utilisation has plummeted to below 55%
- Latest margin data suggests levelling off and retreat in profitability.
- Some OEMs are better placed to cut prices or reorientate towards a more affordable model-mix.

Global LV Output – Longer Term Development

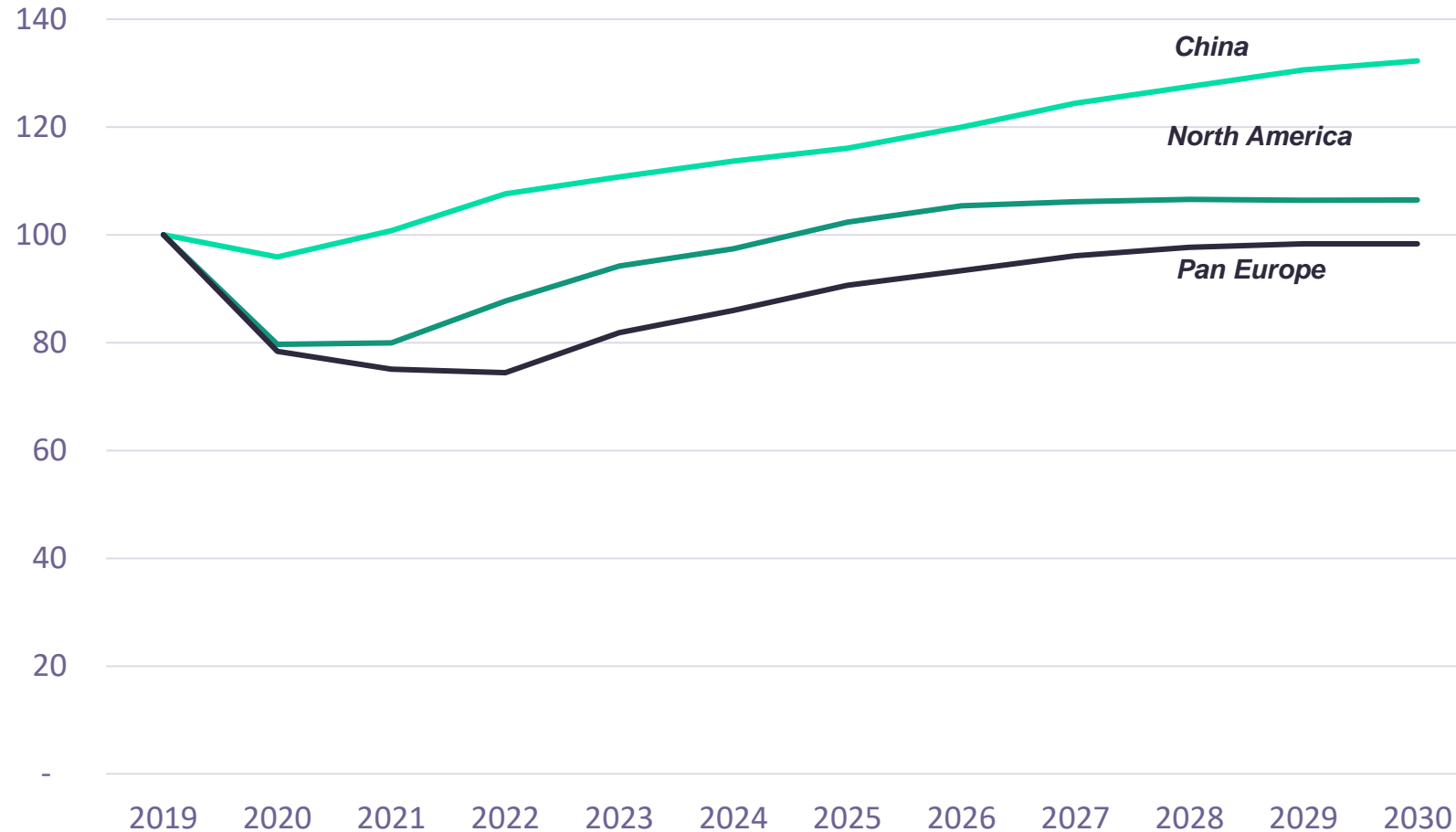


- Forecast uncertainty highest in short-term. Risks include, parts shortages, geo-political conflict, logistic issues, labour shortages and inflation.
- CAGR 22-25 of 4% slightly outpaces demand as inventory rebuild pushes volume through 93mn.
- Mid-term forecast could get boost from BEV conversion; but raw-material scarcity could undermine affordability and consumer appeal.
- Vehicle sharing could be long-term volume risk but only if significant issues solved.
- Longer-term baseline forecast downgraded by an annual average of 6.5mn units because of: macro risk skewed to the downside, longer-run risk of material shortages, elevated vehicle pricing, behavioural change – impact from hybrid working. Utilisation languishes.

Medium-Term LV Production Outlook

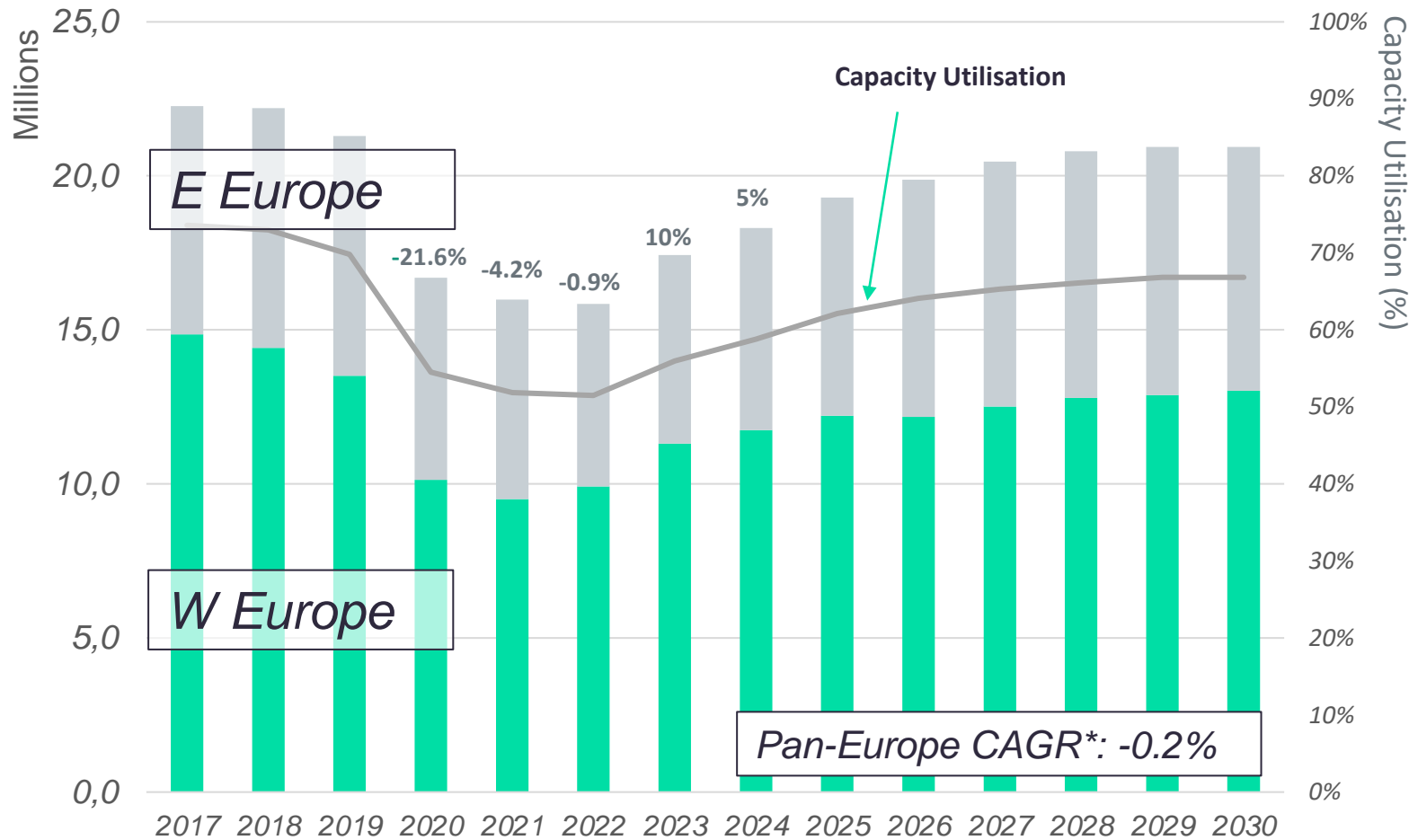


Comparative Regional LV volume performance, 100=2019



- Europe is not expected to reach pre-pandemic levels of LV output within the forecast horizon.
- Russian impact to remain an enduring drag with Central and Eastern Europe growth prospects hampered.
- Adverse trade-flows: competitive threat from Chinese imports, plus protectionist policies temper exports to N America.

Medium-Term European LV Production Outlook



CAGR 2019-2030	
W Europe	: -0.3%
E Europe	: 0.2%
Germany	: 0.9%
Spain	: -0.9%
France	: -1.2%
Poland	: 0.2%
Cz. Rep.	: -1.3%
Russia	: -2.8%

- Annual average forecast downgrade of 3.8mn through horizon since Jan '22.
- Risk of further downgrades to Russian medium-term view.
- Utilisation rates improve from very low levels, but vehicle affordability, BEV import penetration, soft exports, tough financials could increase footprint rationalisation pressure.

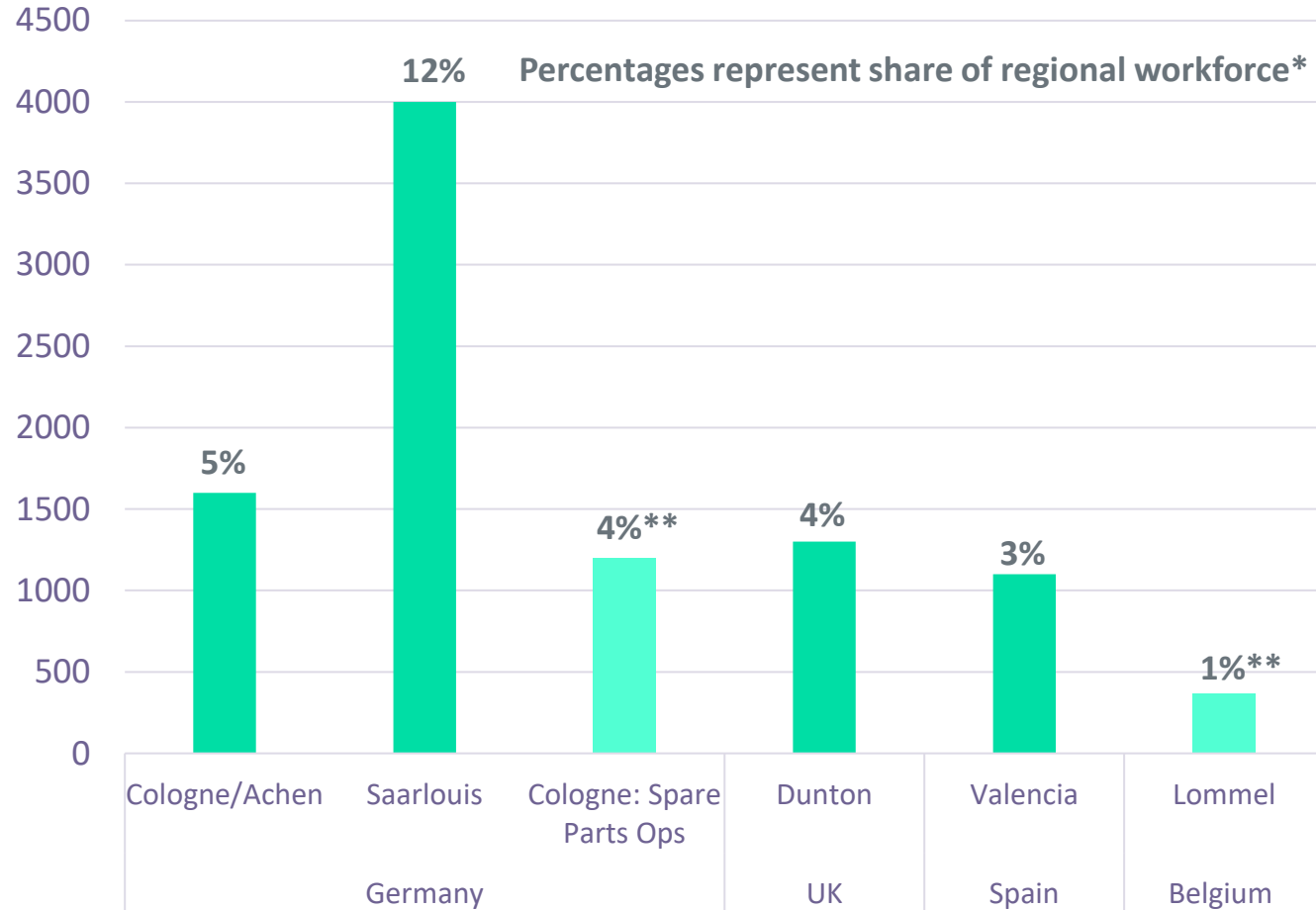
***CAGR: 2019-2030**

European LV Output – Plant Analysis



Ford: Footprint Rationalisation

Potential Job cuts



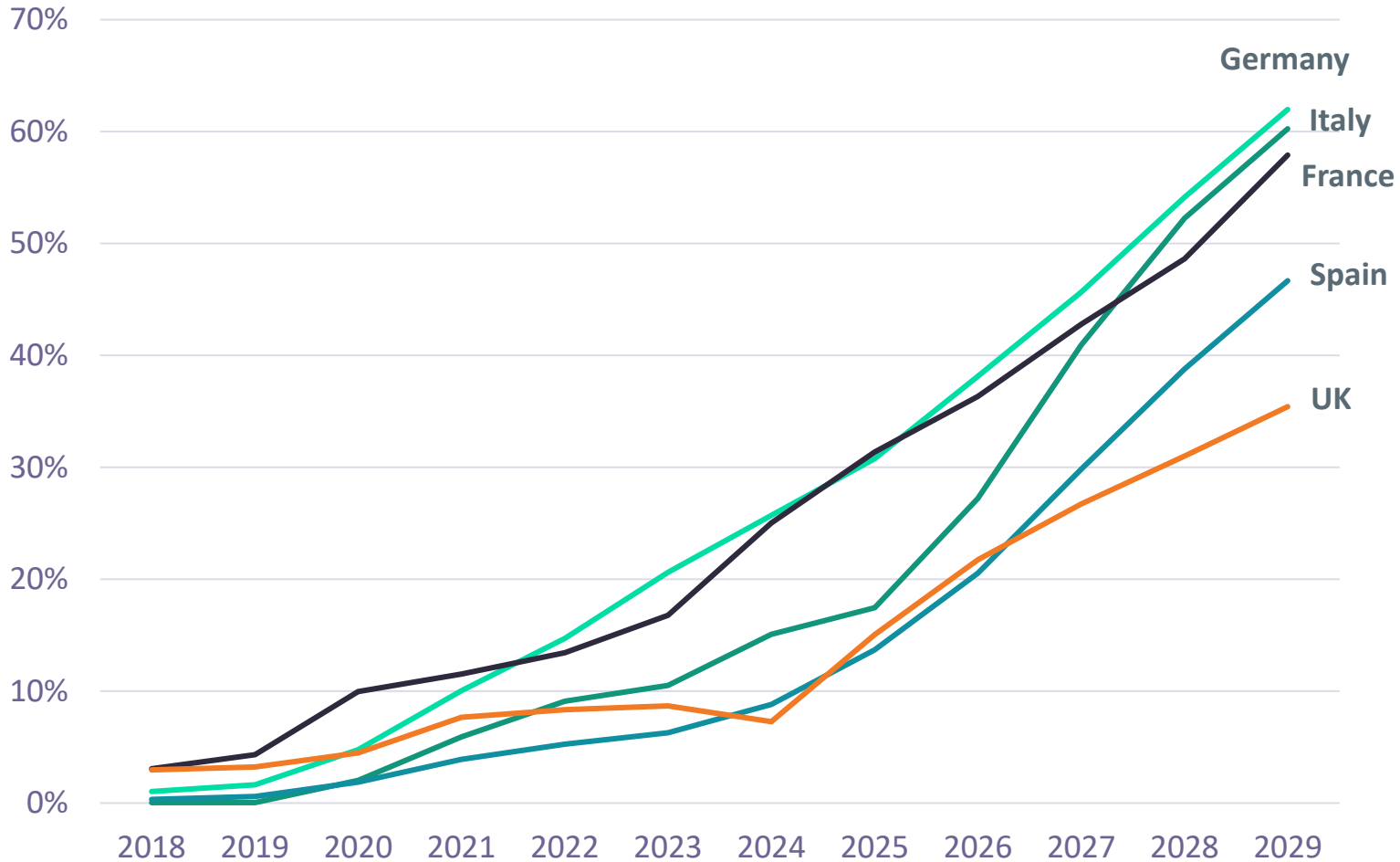
- Model rationalisation, market share loss and electrification shift is prompting Ford to 'right-size' its footprint in Europe.
- The announced plant closure at Saarlouis has the largest potential impact: 4k workers at the site plus the 'removal' of over 400k units of vehicle assembly capacity.
- Runout of the Mondeo, Galaxy and S-Max models prompt planned job cuts at Valencia.
- As complexity diminishes, engineering, development and administrative jobs are to be cut at key German and UK sites.
- Risks of cuts at spare part operations in Cologne and the Lommel proving ground in Belgium.

Source: Ford, various, *reported Ford European workforce at end 2022, **under threat

Domestic BEV Production share by country



LV BEV production as a share of total country LV production : selected countries



- France and German remain core European locations for BEV production with an early and consistent shift away from ICE-based output.
- The pace in transition to BEV grows in the second half of the decade for the other key production locations.
- UK's transition is slower as some OEMs are yet to confirm a commitment to BEV assembly in the country.

European LV Output – Plant Analysis



LMC Data Extract: Plants without planned BEV programs through to 2029

Country	Number of Assembly Plants without planned BEV programs	Aggregated Capacity
Germany	2	498,800
France	3	470,400
UK	2	361,700
Turkey	1	359,900
Spain	1	282,200
Portugal	1	240,500
Netherlands	1	224,900
Finland	1	84,700
Grand Total	12	2,523,100

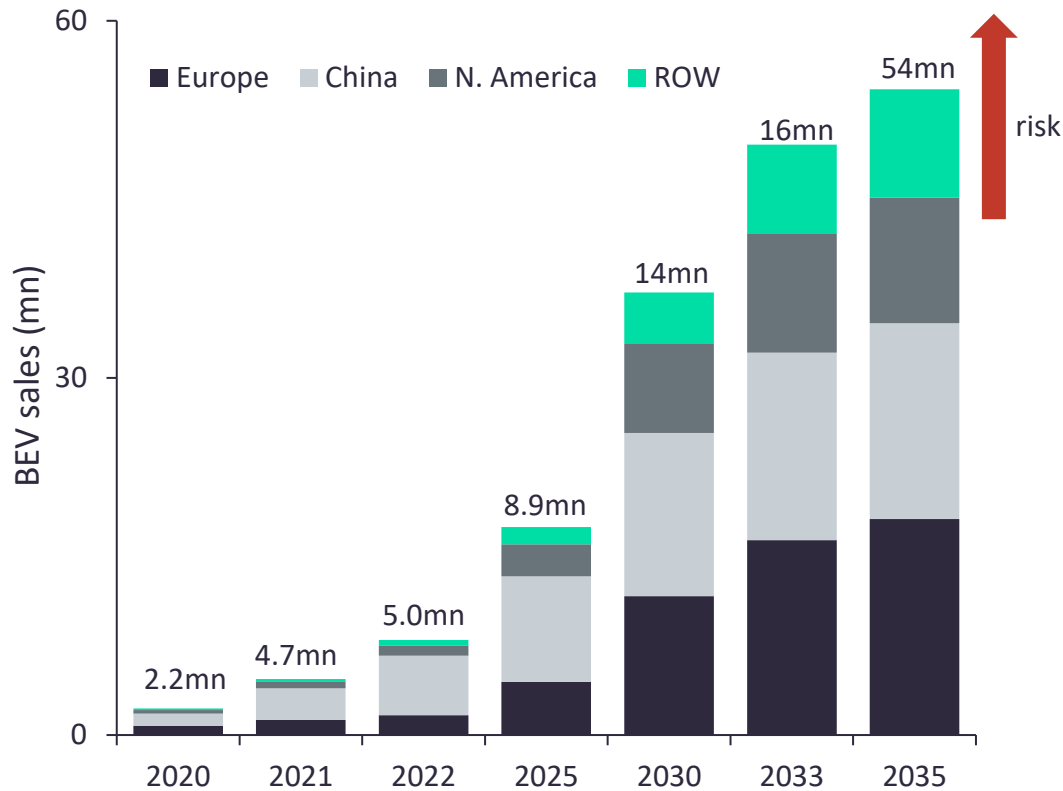
LMC Automotive, European Powertrain Database

- Model cycles will influence the delays for plant transition to BEV model production
- However, under-utilisation, technical change, price and product competition as well as ‘plateaued’ market demand is likely to spark a round of footprint rationalisation.
- Some plants are already earmarked for closure or re-purposing, such as Ford’s Saarlouis facility in Germany
- Others remain at risk without clear directional plans for BEV transition.

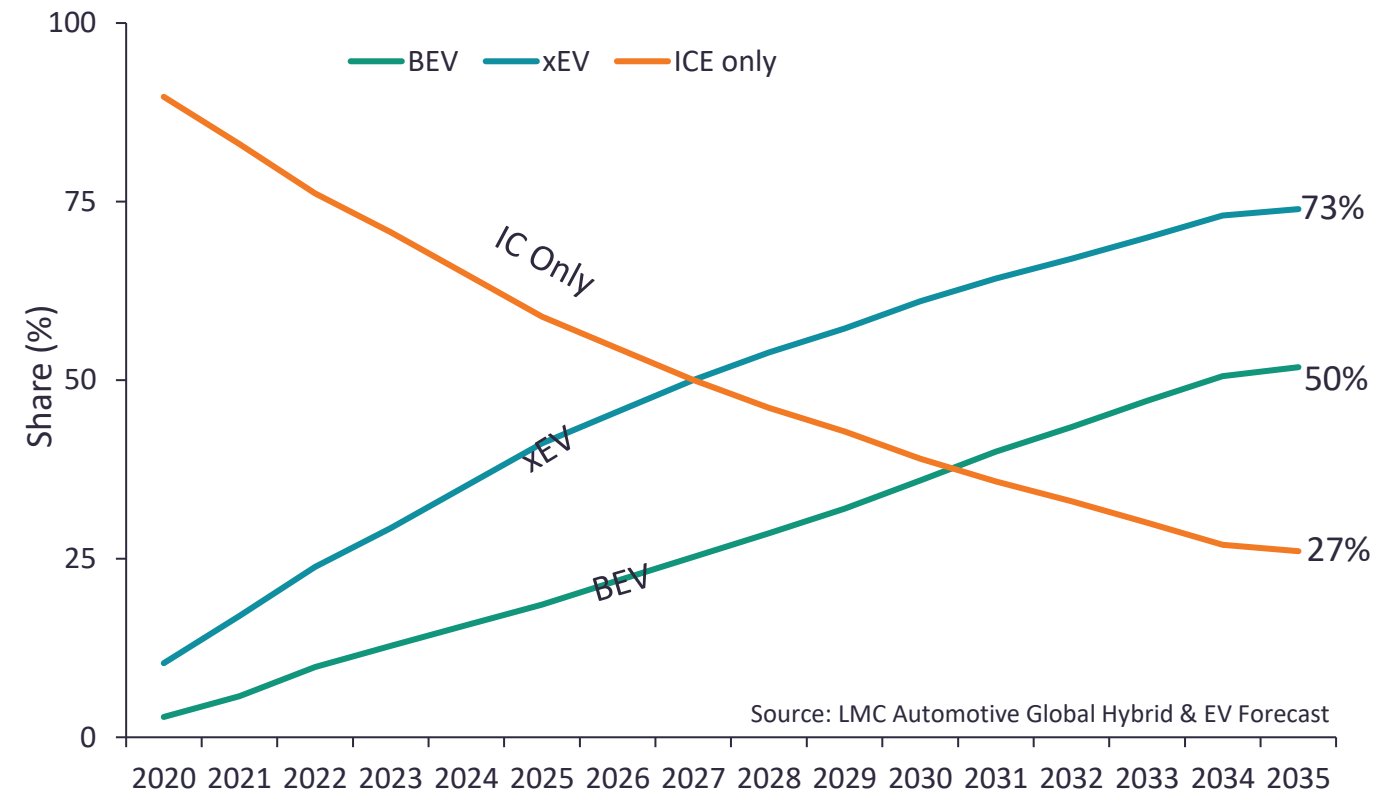
World: BEV and xEV forecast by major market



World LV BEV outlook by major region



World LV BEV, xEV and ICE trends, base case



Source: LMC Automotive Global Hybrid & EV Forecast

- Europe volumes get closer to China, driven by policy, and is expected to outsell China by 2033.
- Growth in NA is from lower base and remains behind both China and Europe throughout forecast though new policy could push volume and share high.



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