



Automotive Market Outlook

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Leveraging Analysis, Relationships and Insight Into Unique Engagements

Market Sizing

"Will Thailand be the new China?"
"Will there be a market for low cost LIDARs in North America?"

Market Intelligence

"My sales department told me we have 80% market share on OEM X but I'm missing 200,000 units on this account."

Portfolio Management

"How can I benefit from the emergence of the connected car and new mobility trends?"

"How is the fuel mix changing in Europe after the VW affair? Does it make sense to invest in SCR systems?"

Should I include shock absorbers in my aftermarket portfolio?

Competitor Benchmark

"I have a vague idea of my competitors' production network, I have enough problems looking after my own."

Customer Targeting

"It is difficult to prioritize RFQs based on OEMs' sourcing strategy. We end up dedicating an equal amount of resources to each RFQ, we're always busy."

Risk Assessment & Mitigation

Should I invest in new moulds based on these promising RFQ volumes from the OEM

"We are not sure whether we should open a new plant in China, the market seems rather volatile right now. What could be the upside?"

Resource Allocation

"In which regions will I need to hire application engineers to best serve my clients?" / "where could I be running low on capacity"

Unparalleled combination of industry-leading SMEs, ongoing forecasts and analysis integrated into critical client engagement. Structured to drive actionable insight amidst our shifting automotive environment.

Agenda

- ***Five Key Forces***
- *Global Market Dynamics*
- *North American Outlook*
- *Impact on Suppliers*



An Industry of Many Vectors

There are Known ... Knowns

- Segment mix and OEM customer mix requires new approaches and engagement dynamics
- The pace of new engine and transmission design has declined precipitously
- New players will enter both the OEM and supplier ecosphere – altering the landscape

There are Known ... Unknowns

- Electrified propulsion will increase in all regions – There is uncertainty as to how it will exactly play out
- The industry value equation will alter as secular forces (EV and AV) further penetrate – new pools will emerge
- Virtually every OEM is envisioning how to be efficiently competitive in an ACES environment – Not all will win

There are Unknown ... Unknowns

- Extraneous events which were never contemplated will impact our industry
- As we progress down the ACES path, new partnerships/affiliations not anticipated will emerge
- New technologies and innovations will steer the course of our industry

5 Forces

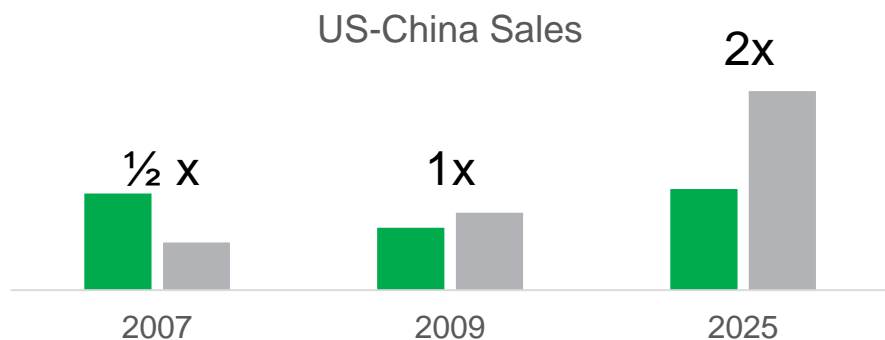
- Impact of China
- Electrification
- ADAS
- New vs. Old Co.
- Value Shift

Every enterprise will need to focus on new revenue streams, mitigating risk and engaging in new partnerships

1. Growing Influence of China

Beyond Volume, Technology w/Scale

Sales market will grow ½ x to 2x the US in 18 yrs

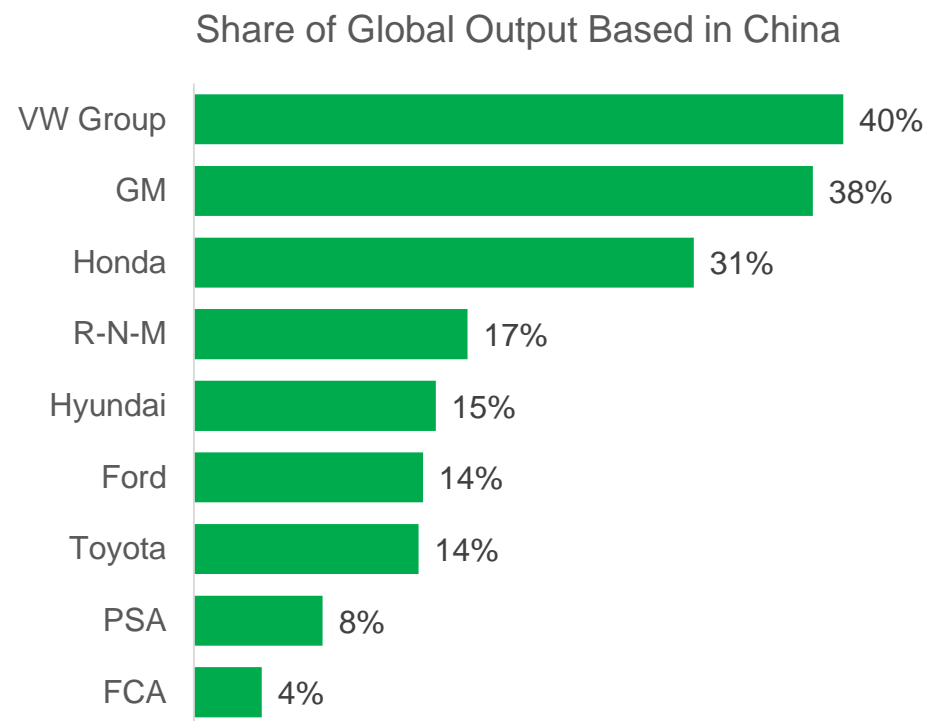


China is no longer a production outpost

Share of Western OEM production from a global platform

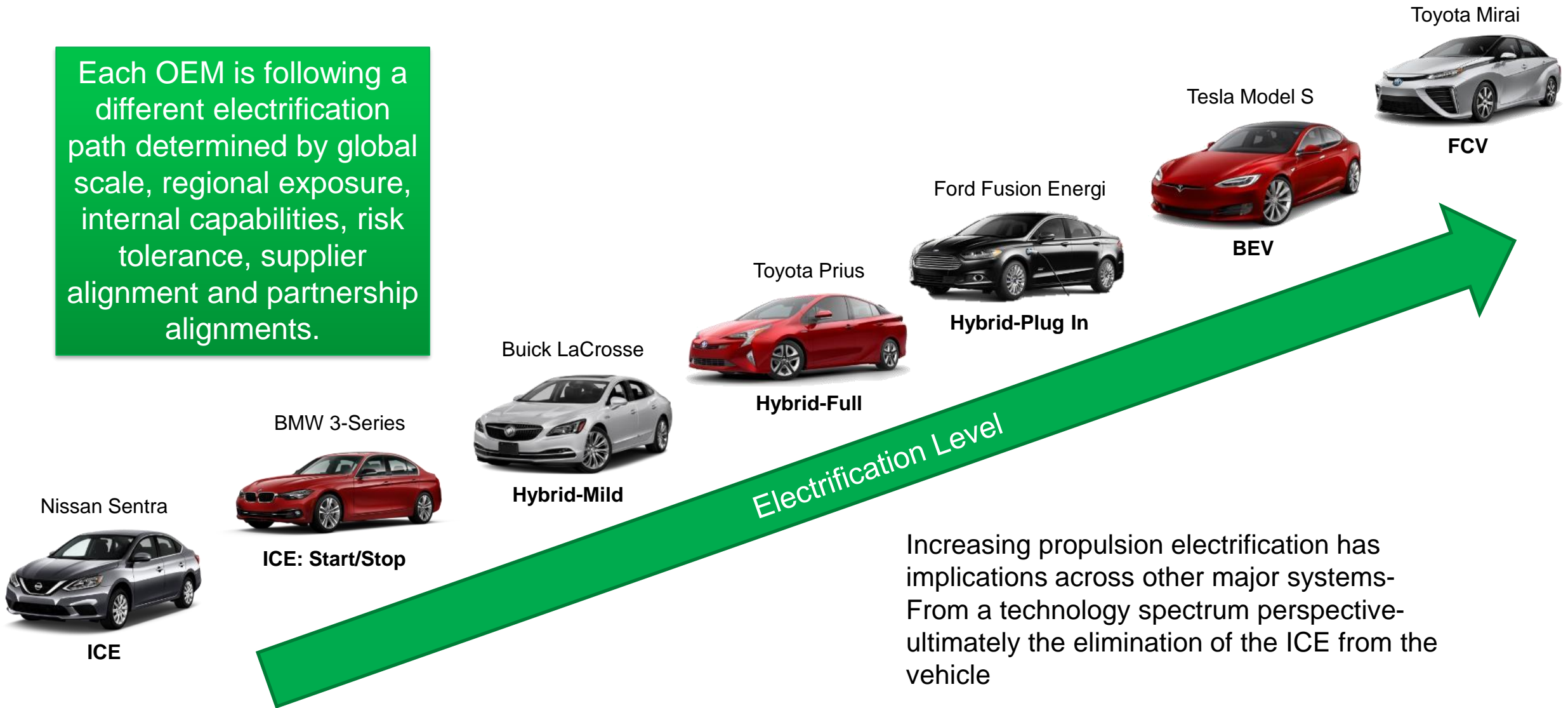


Dependency on China volume also dictates global propulsion and platform strategies



Propulsion System Design – No Single Strategy

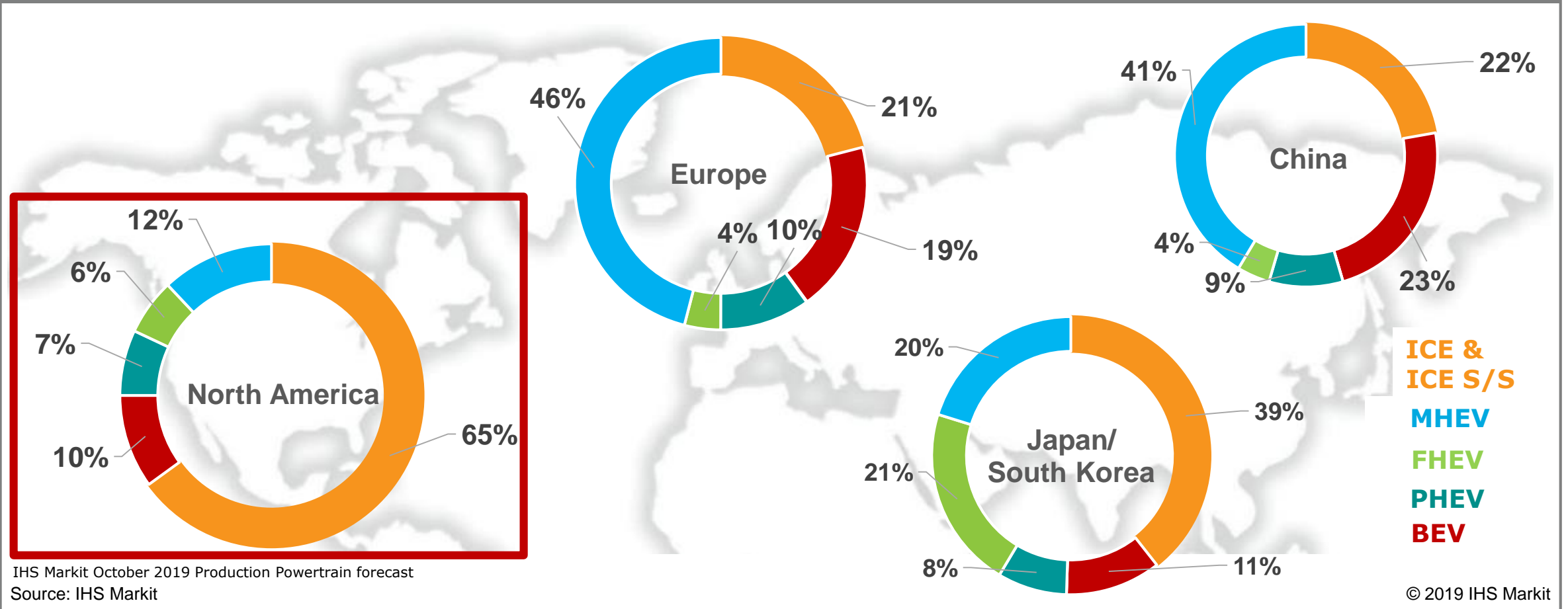
Each OEM is following a different electrification path determined by global scale, regional exposure, internal capabilities, risk tolerance, supplier alignment and partnership alignments.



Increasing propulsion electrification has implications across other major systems- From a technology spectrum perspective- ultimately the elimination of the ICE from the vehicle

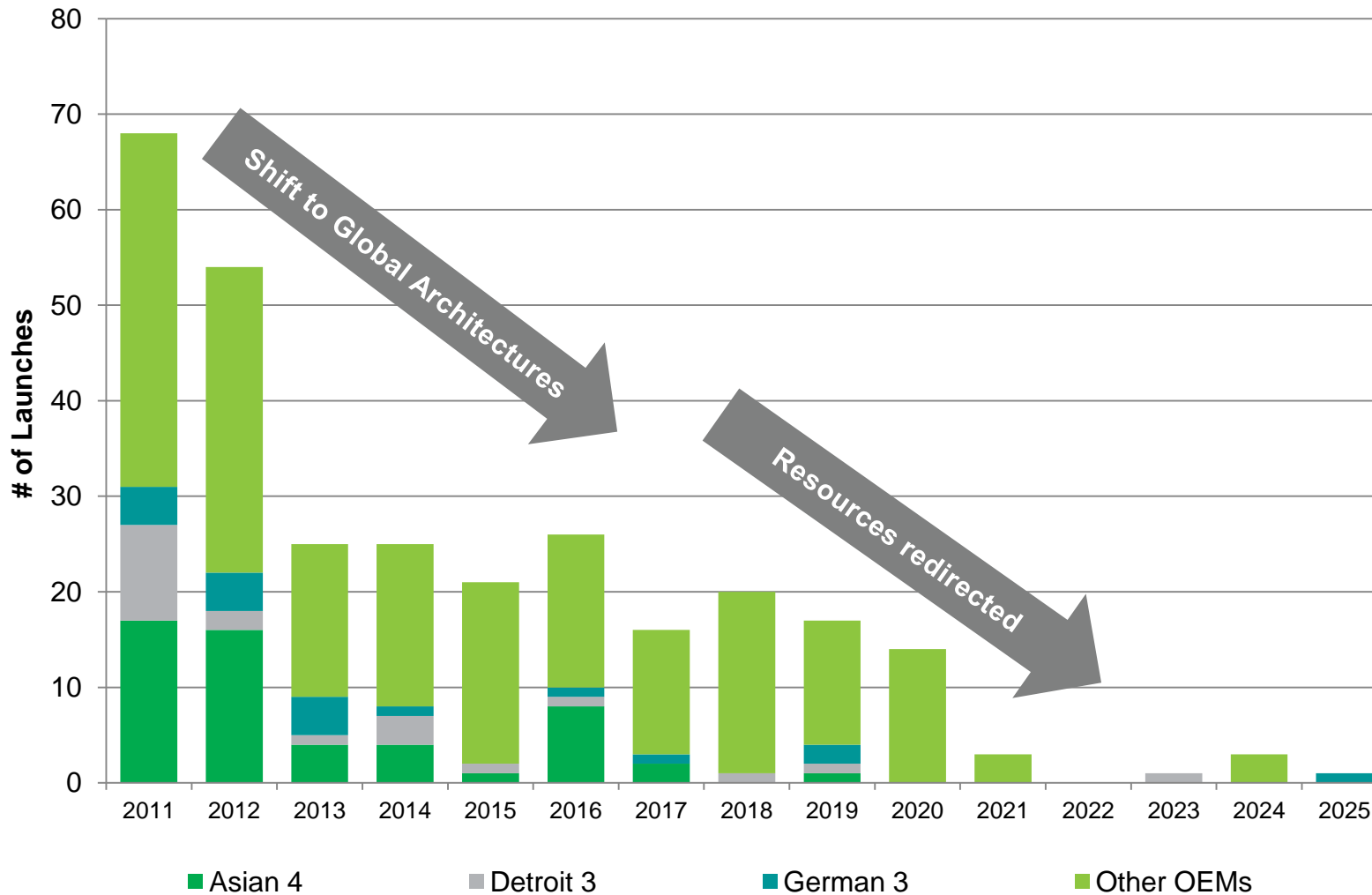
2. Global Propulsion Design Islands

2030 Snapshot, and one region is truly alone



Global Engine Launches

Decline in New Engine Families post 2020



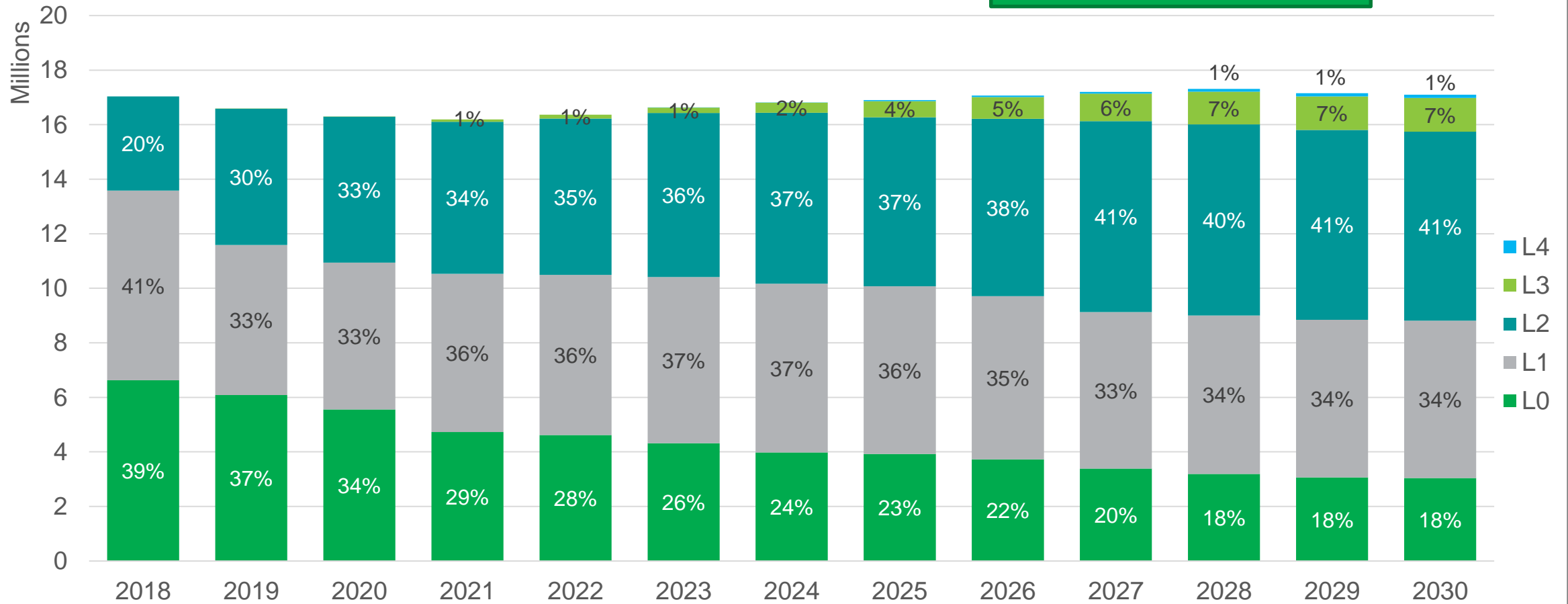
Importance of Electrified Propulsion to Suppliers

- Engines still in production with new technologies and improvements continuing. Transmissions following the same fate.
- Ability for resourcing of major components may wait until required by technology shifts – procurement and engineering are refocused.
- Traditional suppliers in the powertrain space will find it difficult to alter their trajectory without critical new technologies or shifting course.

3. Evolution of Automation by SAE Levels

Competition in adoption of Level 2 and 3 will be the critical battleground.

North America Autonomous Technology outlook



4. New co. versus old co.

Substantial capital and resource diversion emerges

- Investment in electrification, shared mobility, and autonomous driving enables the formation of new entities and business models, such as:
 - Reduced reliance on fixed assets
 - Ease of integration of partnerships and alliances
 - Differing valuation structures (read 'the street') and capital/resource deployment
 - New channel strategies and technology cadence
- More traditional automotive entities evolve:
 - Under continued pressure to improve efficiency and cost containment
 - Capital allocation under intense scrutiny due to timelines and alternatives
 - Potential separation of skill sets and talent attraction



Emergence of new co. impacts suppliers

- Capital, resources, and attention slowly shift toward new business models.
- In the continued battle to drive value and differentiation, innovation takes center stage.
- Transition will be difficult for many and impossible for others.

5. Secular Forces – Significantly Impacting the Vehicle/Supplier Ecosystem

Conventional

Some conventional platforms can implement batteries, but cannot change the overall architecture to form a battery driven vehicle assembly.



Multi-Energy

Initially designed to support both BEV and conventional powertrain vehicles. Structure is more flexible than conventional platform.



Battery Electric

Platform is designed only for pure BEV applications. Skateboard style architecture allows for more battery capacity and more interior space with the same vehicle size.



Industry Dynamics - Summary

- Market complexity has increased exponentially within the expanding automotive ecosystem. Changing dynamics driven by electrification, autonomy and 'new mobility' creates new opportunities and challenges.
- China's impact cannot be underestimated – regulatory, scale, pace of adoption and emergence of new players on the global scene.
- OEMs are busy reinventing themselves to be more flexible, less capital reliant, partnership/affiliation-focused and reevaluating the value characteristics within the organization.
- Platforms and architectures being designed today are dual-mode – offering challenges in packaging, efficiency, customer delight and cost with a view on reducing stranded capital.
- Pace of both EV and AV adoption will vary by region though economies of scale and a global marketplace will even the playing field over time.

Suppliers will continue to struggle with the 'Bridge' – Adoption & profitability of EV and AV technologies juxtaposed to the leading R&D required.

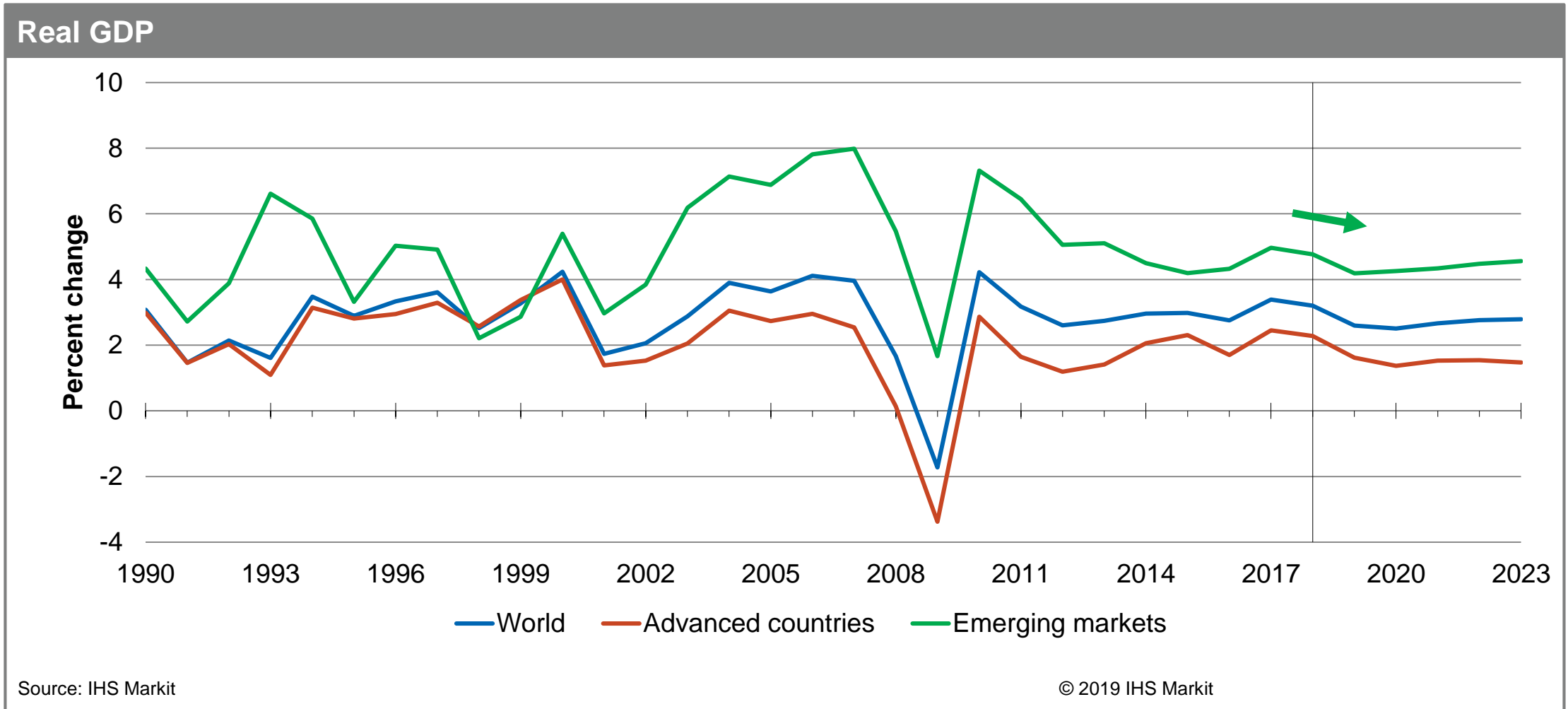


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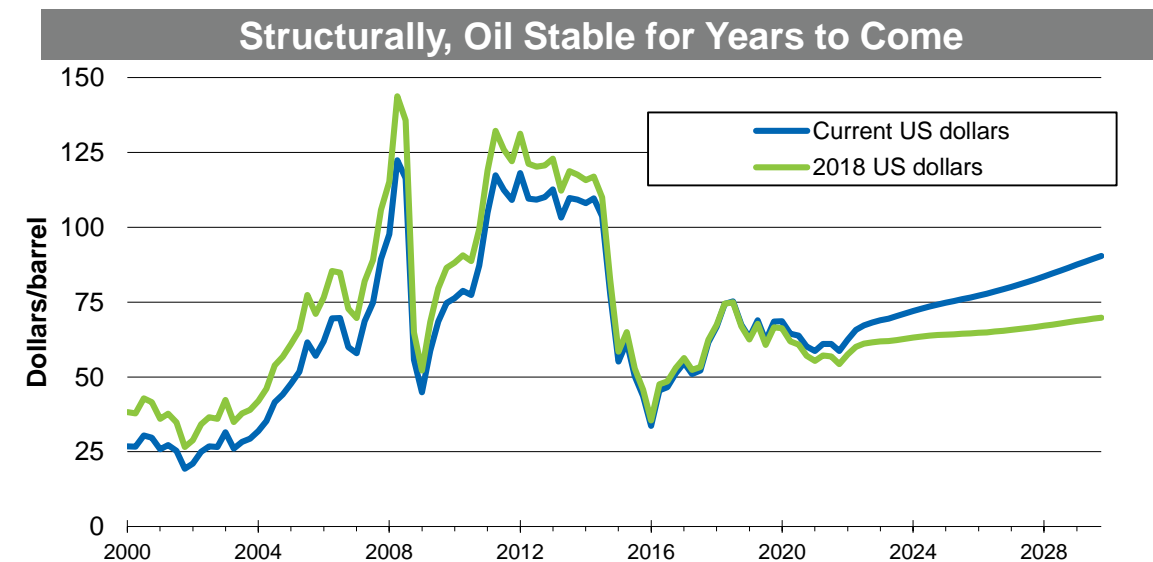
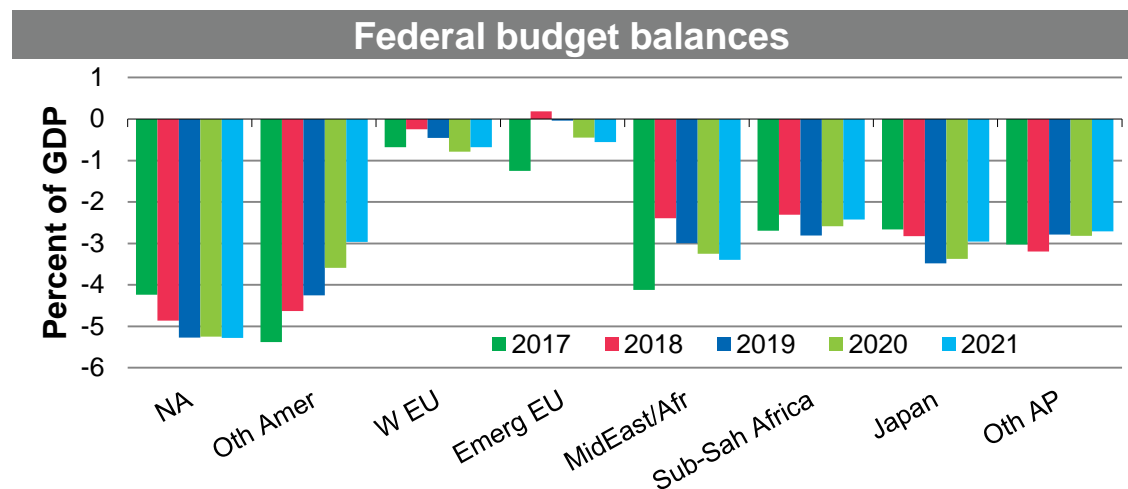
- *Five Key Forces*
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Economic growth is slowing in advanced countries and emerging markets

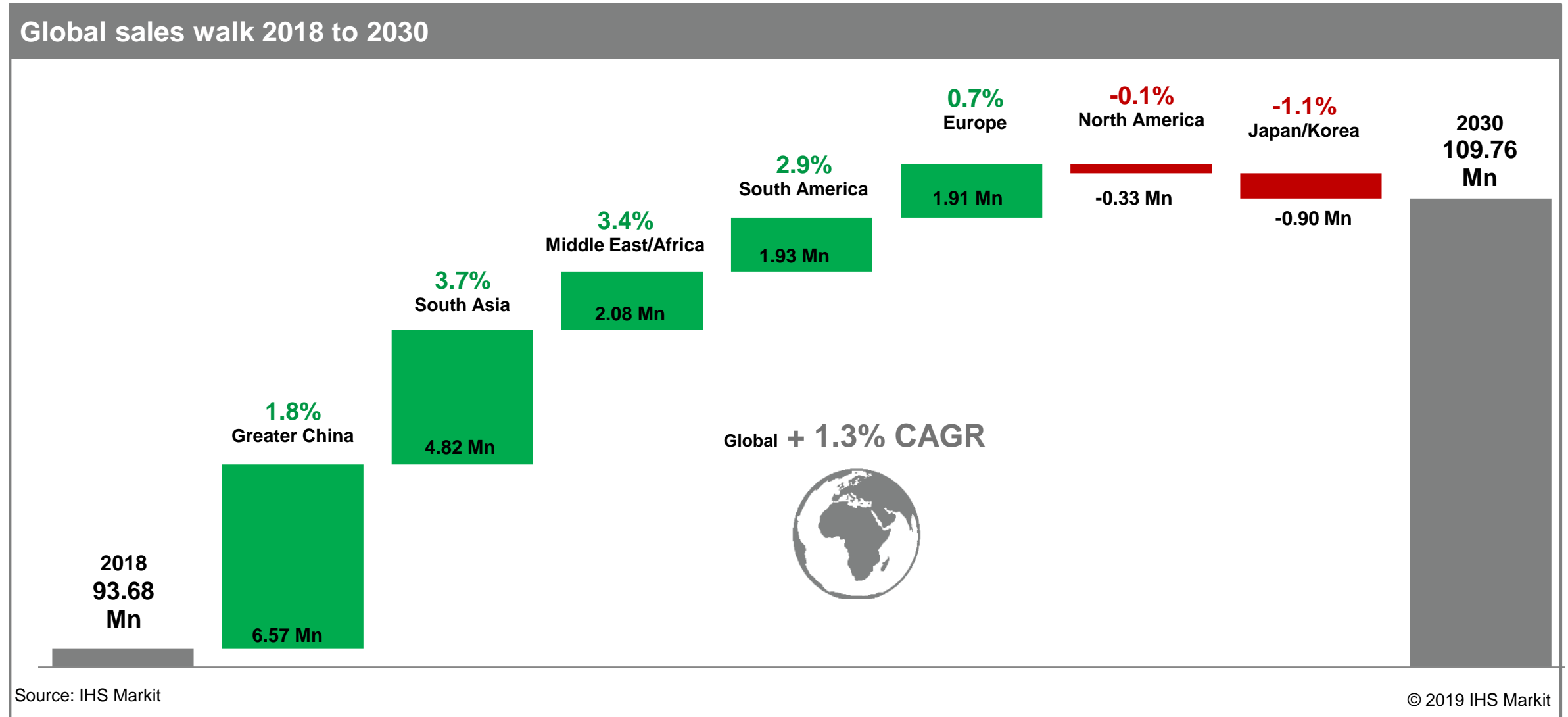


Deficits Problematic, Oil Long-term Stable



- Softening global demand growth is restraining commodity prices.
- With core inflation calm and downside risks prevailing, near-term monetary policies will be accommodative.
- The US dollar will appreciate moderately in the near term, based on favorable rates of return and risk aversion.
- Downside risks include an escalation in the US-China war, new trade conflicts, hostilities in the Middle East, a hard Brexit, and rising debt levels.
- Relatively low interest rates and sizable fiscal deficits in many countries leave little scope for policy stimulus in the next recession.
- Commodities in general are moderating as global demand moderates.

Global Sales Moderates Through Still Rises



Global LV Production Outlook

80%+ of Total Growth from Emerging Asia/China – 2019 Volume Reset

Region	2018	2019	2020	2021	2022	2026	2030	CTG 2018-26	CAGR 2018-21	CAGR 2022-30	Notes
Europe	22.0 M	21.2 M	21.1 M	21.6 M	21.9 M	22.5 M	23.1 M	5%	-0.6%	0.7%	• Tier 3 & 4 city growth
Greater China	26.9 M	24.5 M	24.7 M	25.8 M	27.3 M	31.9 M	34.2 M	53%	-1.3%	2.9%	• Lack of NEV success & Trade
Japan/Korea	13.2 M	13.2 M	12.9 M	12.6 M	12.4 M	12.8 M	12.7 M	-5%	-1.6%	0.3%	• Slow domestic markets, production co-location
Middle East/Africa	2.6 M	1.9 M	1.9 M	2.1 M	2.3 M	2.9 M	2.9 M	3%	-6.0%	2.9%	• Focus of more attention by OEMs
North America	17.0 M	16.3 M	16.5 M	16.6 M	16.7 M	17.2 M	17.3 M	3%	-0.7%	0.5%	• New capacity (Mex), D3 re-alignment
South America	3.4 M	3.3 M	3.4 M	3.8 M	3.9 M	4.5 M	5.2 M	11%	3.0%	3.7%	• Well below 2013 record of 4.5 mil
South Asia	9.2 M	8.3 M	8.5 M	9.2 M	9.8 M	12.0 M	14.3 M	30%	0.2%	4.9%	• India domestic & export weakness, ASEAN rise
Grand Total	94.2 M	88.8 M	89.0 M	91.8 M	94.2 M	103.6 M	109.8 M	100%	-0.9%	1.9%	

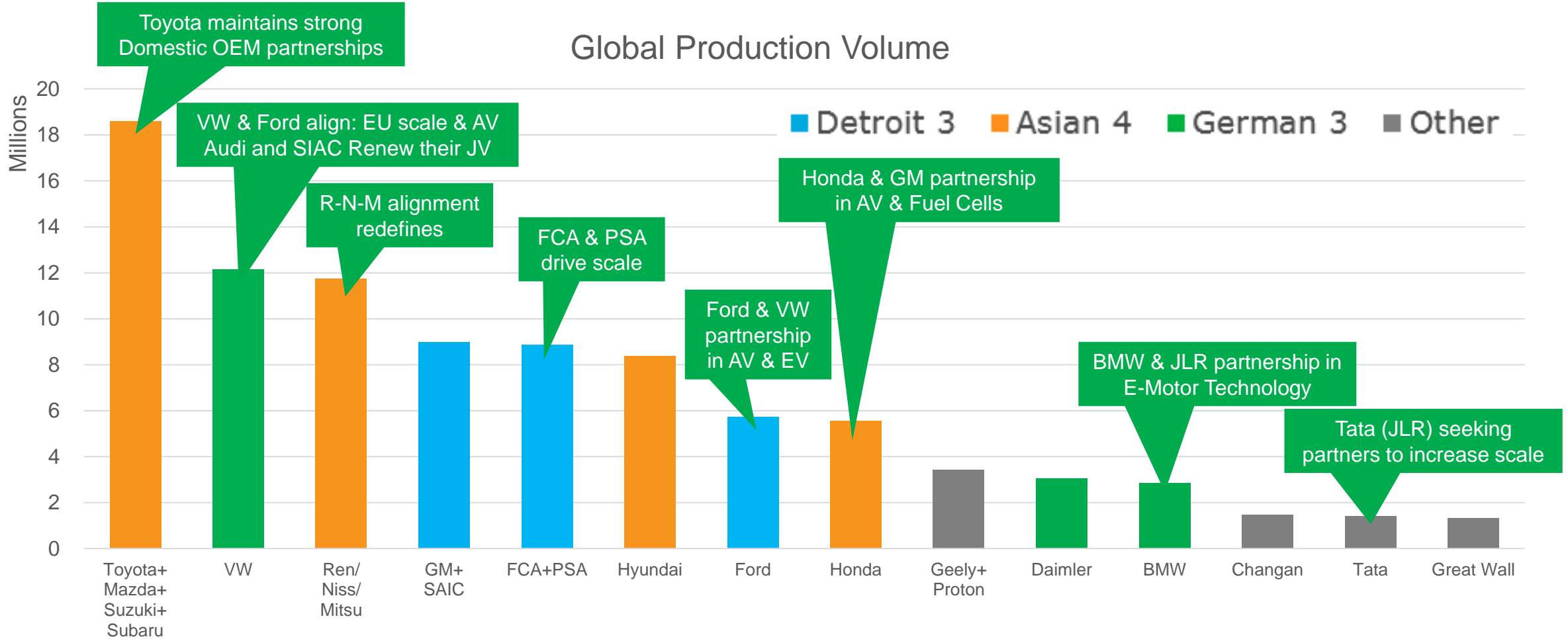
CTG – Contribution to Growth

Source: IHS Markit Light Vehicle Production Forecast



Top OEM Cooperative Groups by Production Volume 2026

OEM Partnerships Enable Greater Scale, Risk Reduction and Cost Savings



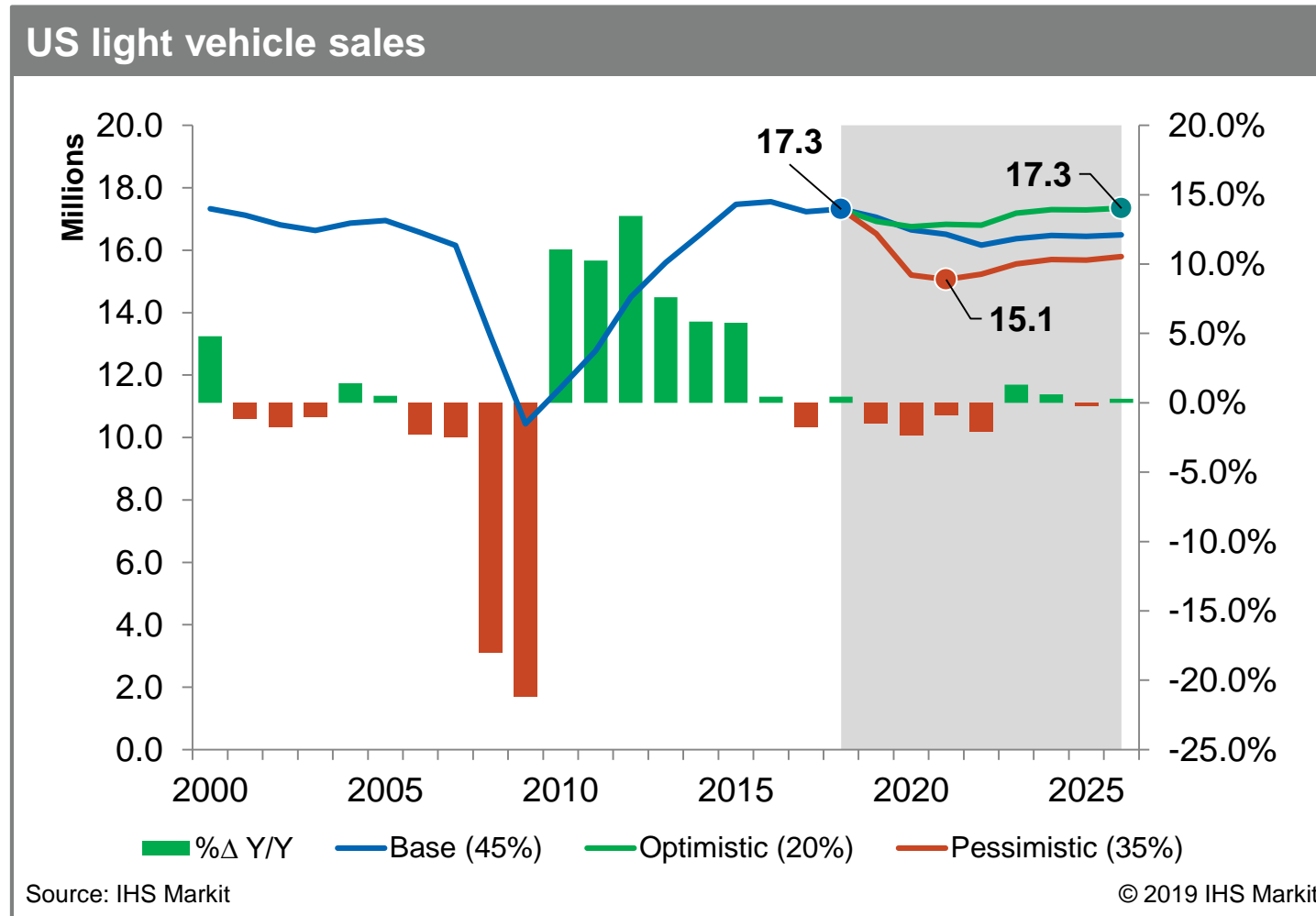
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US Light Vehicle Sales

Reaching a saturation point

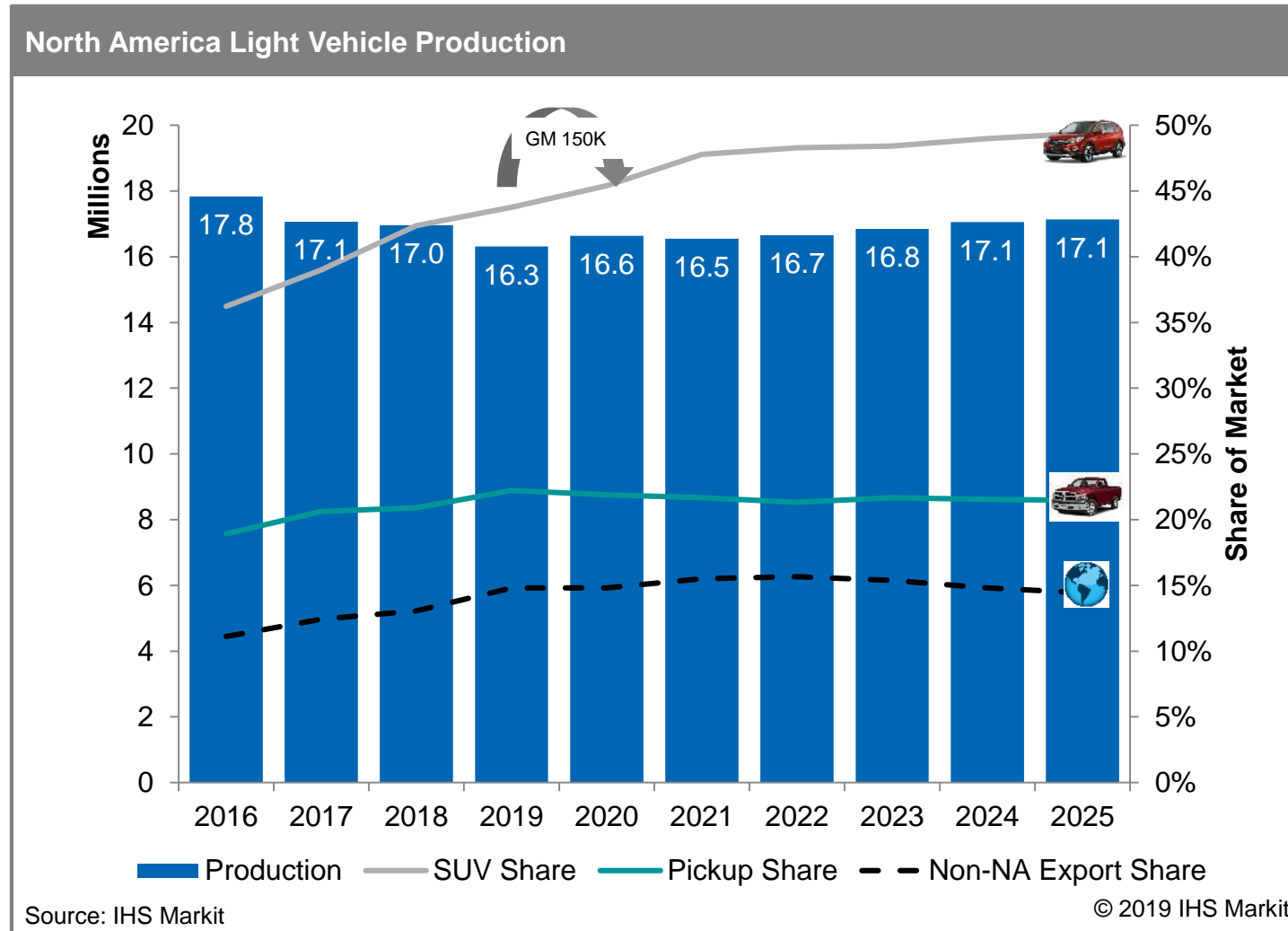


Economic issues

- US consumer outlook to remain broadly supportive
- Sales mix increasingly attractive, but riskier and more competitive
- Pressure on OEMs to manage plateau
- Opportunities to find right customer based on vehicle age and scrappage
- Launches to accelerate, mix increasingly attractive
- Vehicle development costs rising
 - Regulatory compliance
 - Consumer contenting
- Market attractive from consumer perspective, risk shifting to lenders

North American Light Vehicle Production Outlook

Capacity Expansion Enables Modest Growth

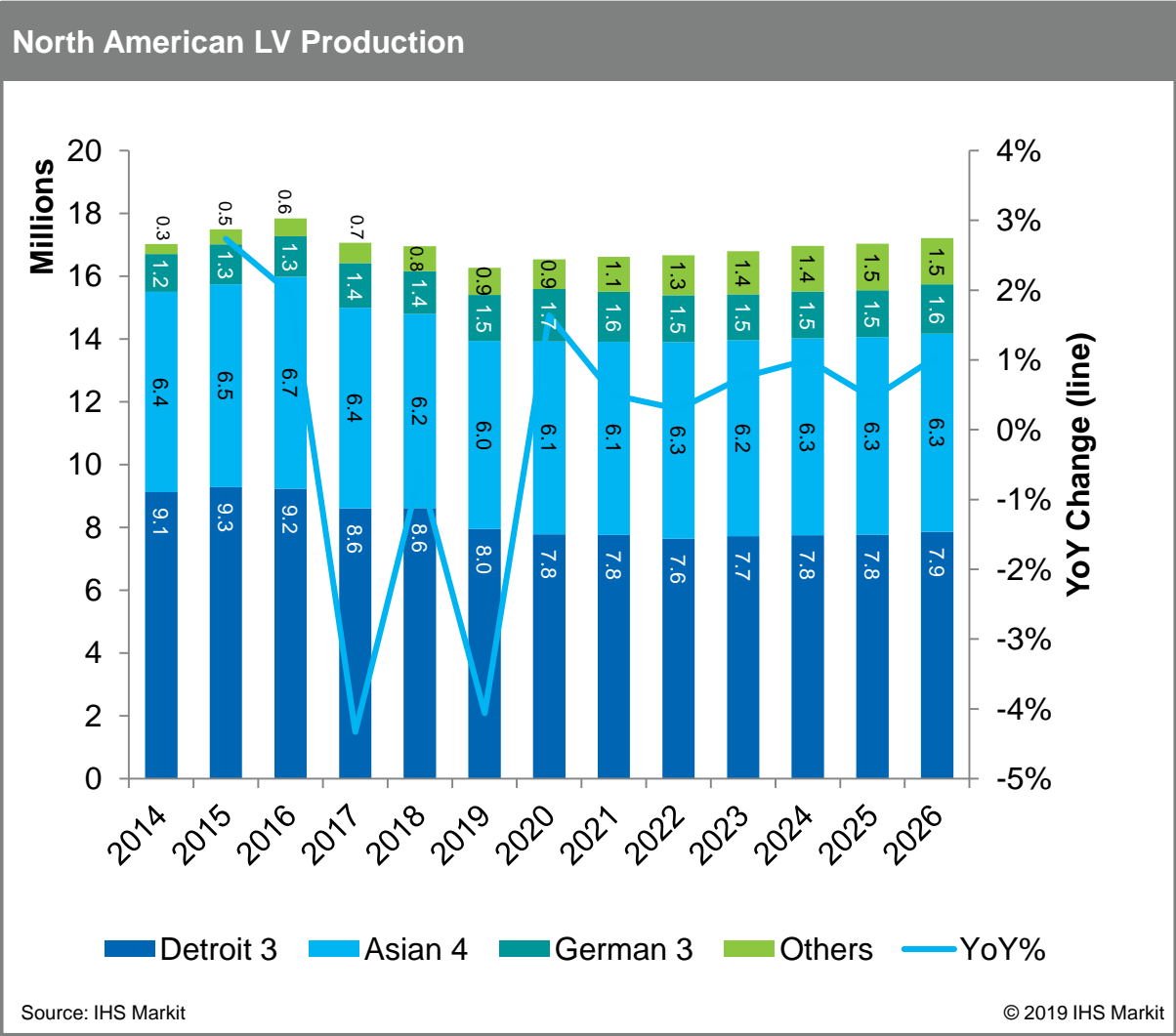


Growth Next Decade Focused on New Players

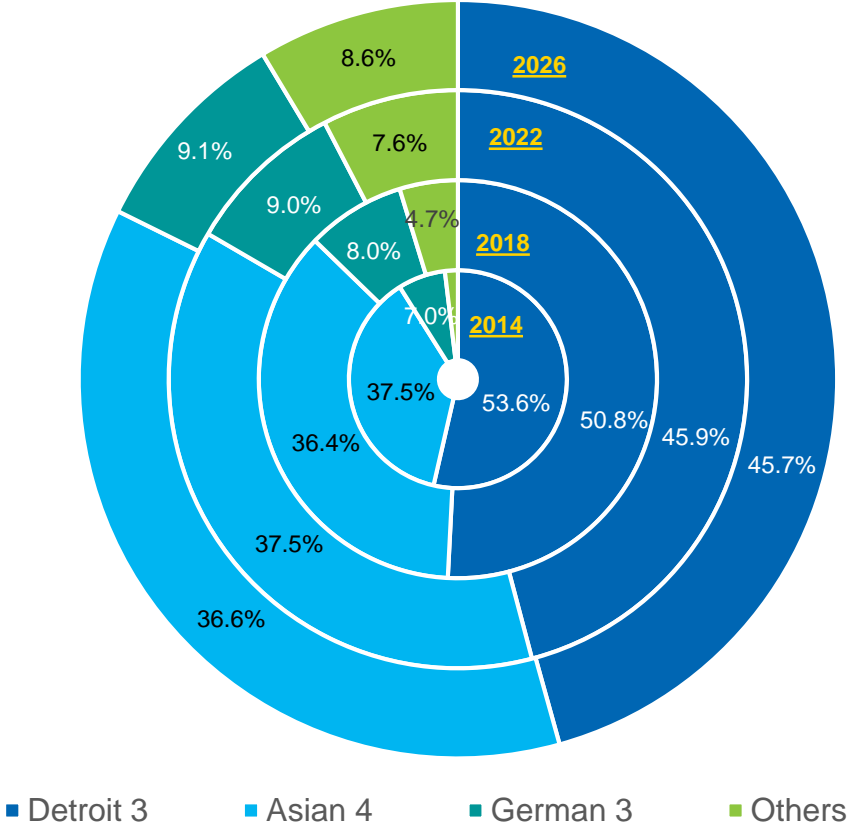
- OEMs find balance amid rising costs and increased competition
 - Incentives
 - Fleet
 - Inventory
 - Portfolio mix shifts
- Growth due to localization and portfolio expansion
 - Exports support production growth
- GM labor stoppage shifts ~150k of volume to 2020

NA LV Production Outlook

German 3 and "Others" Rise

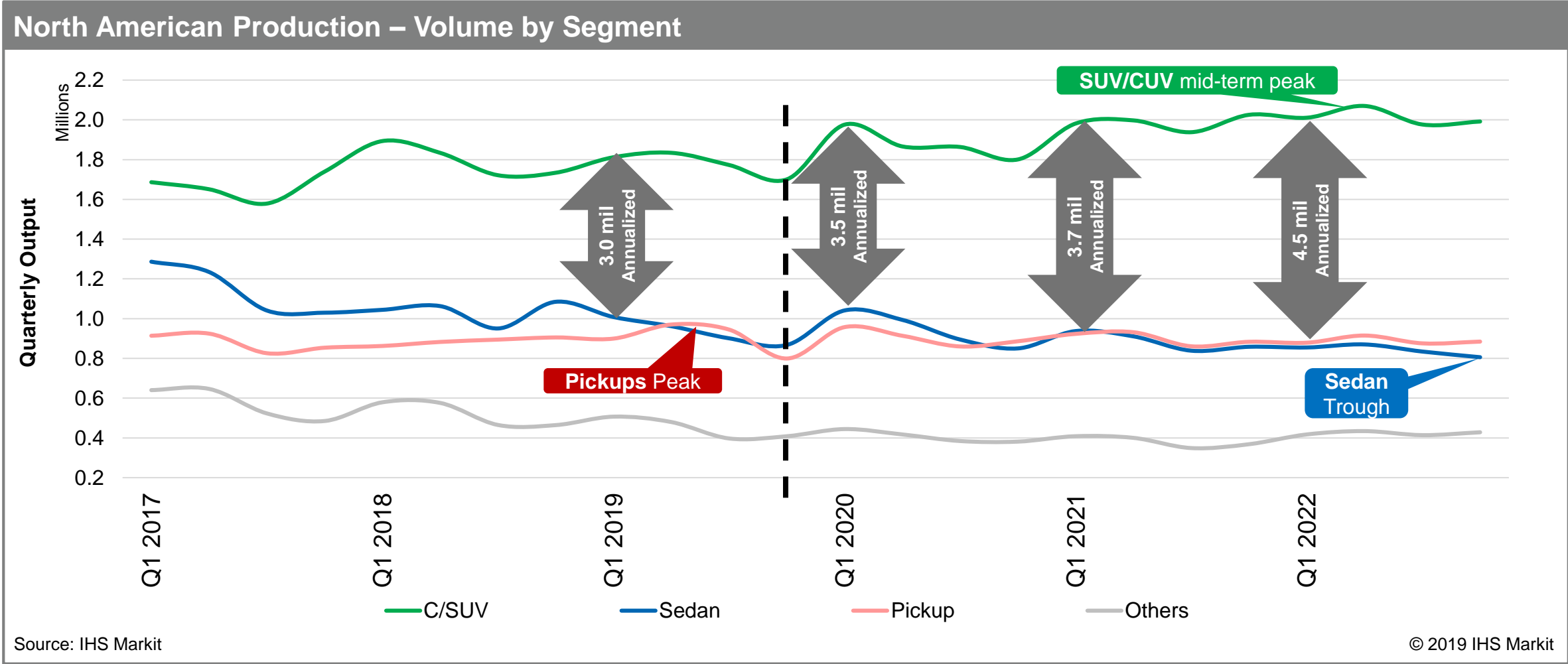


Production Share by OEM Type



North America Production Volume by Segment

The Gap Between SUV and Sedans Widen



Production Outlook: North America – NA Regional Shift

Segment & OEM Shifts Pressure Logistics and Supply Structures



- Mix towards D/E-segment and Full Frame
- Detroit 3 still account for +60% of MW/ONT volume by 2027

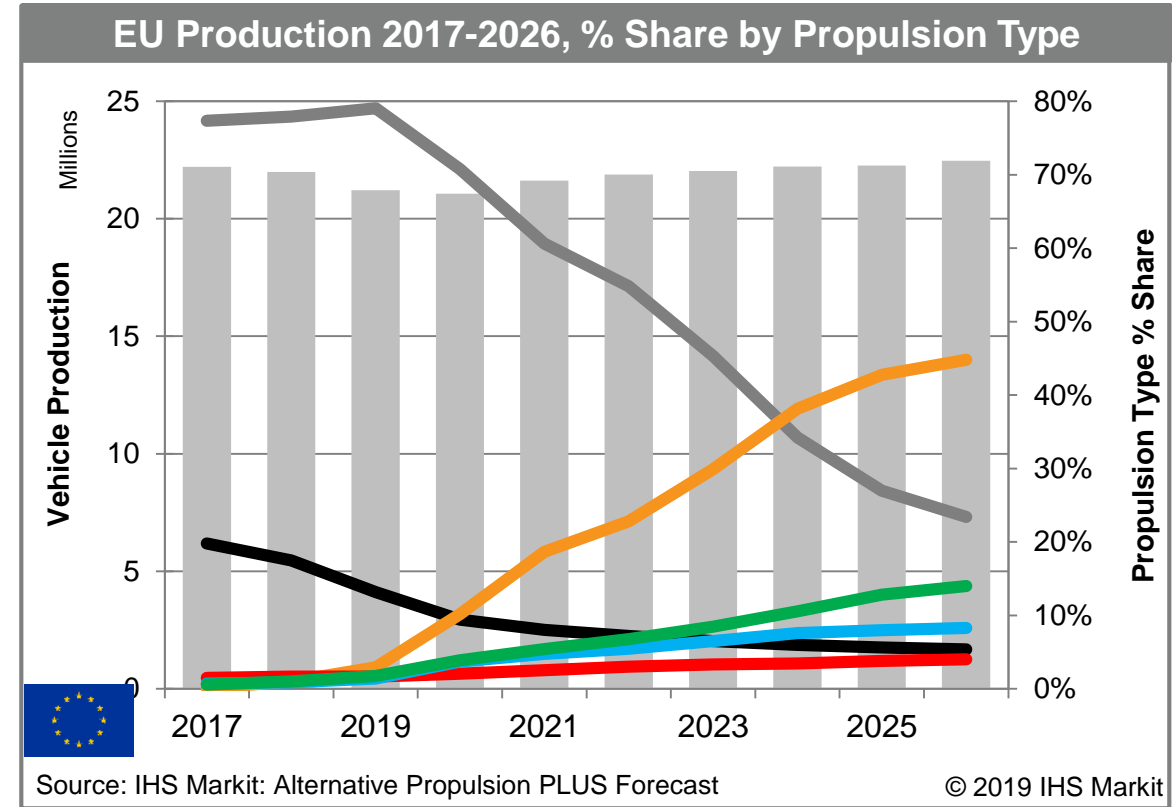
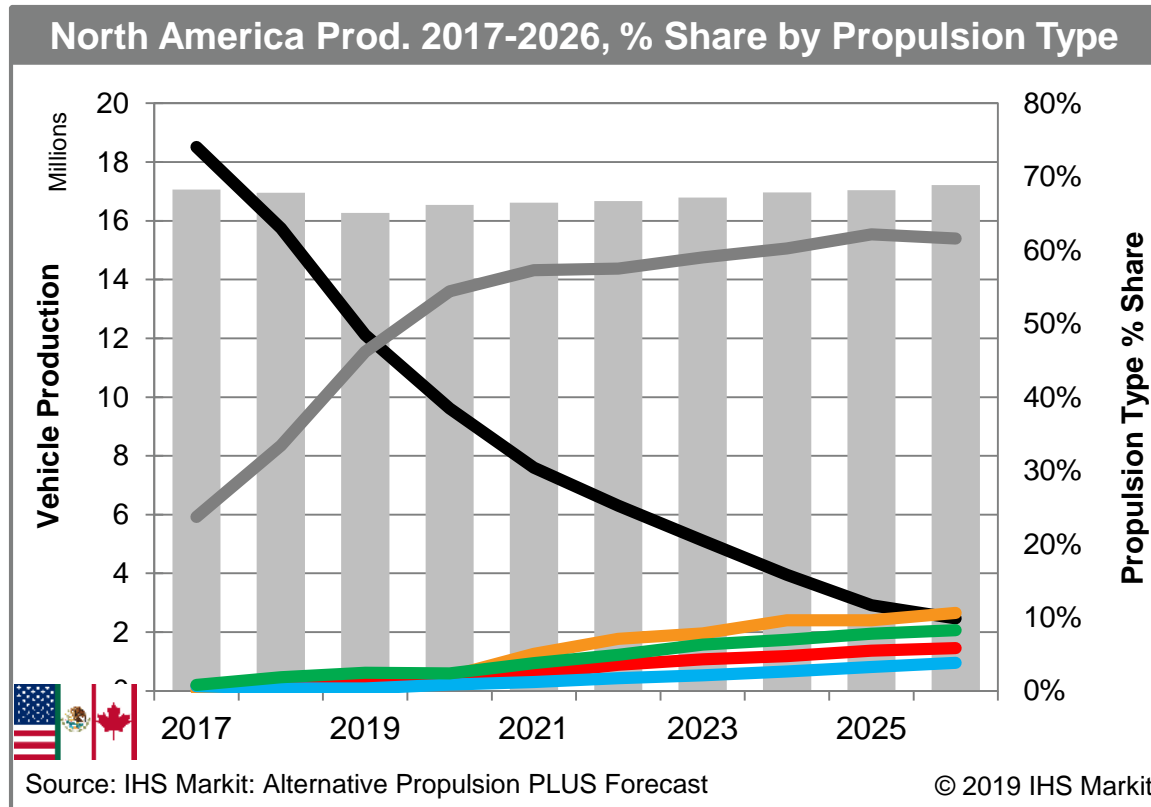
- Remarkable stability – newer facilities w/export focus
- Higher concentration on C & D-segment CUVs

- Mid-Mexico has recently accounted for ~70% of Mex volume
- Rise of B & C-segment products with increasing luxury focus for export

Electrification Trends – North America and Europe

- In NA, Stop-Start will provide most of the relief from emissions regulations over the forecast horizon
- MHEV is the leading electrification method, though production of alt. propulsion types will be low overall

- EU was an early adopter of S/S, and forecast toward MHEV as the dominant propulsion strategy
- Pure EVs are expected to achieve ~10% production share by 2024, besting Full- and Plug-In-Hybrids



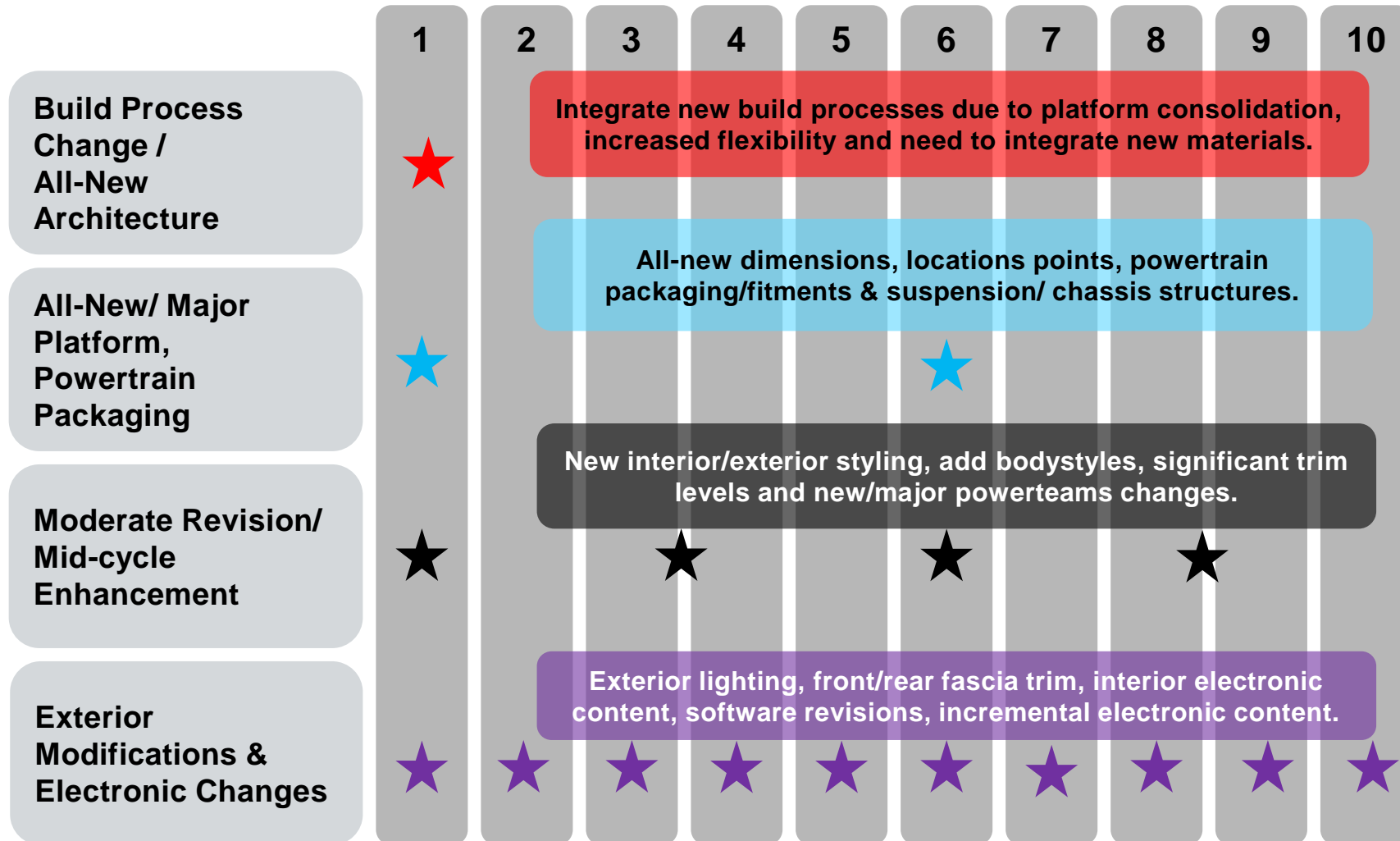
Production
 % ICE
 % ICE: S/S
 % MHEV
 % FHEV
 % PHEV
 % Electric

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The New Cadence – Faster, Integrated and Global



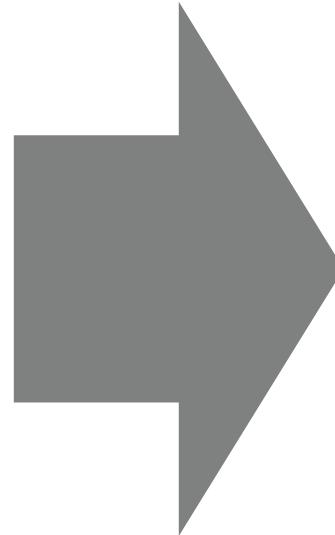
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Scale & Global Platforms
 - Staying aligned to drive multi-region scale is key.
- 5
Driven by Content
 - Integration of electronic content, emissions compliance and global platforms drive a new dynamic.
- 2.5
Feeling The Pressure
 - Tier 1 & 2 require faster, more integrated development processes, tooling coordination and upstream supplier coordination.
- 1

Capital and Resource Decisions

Lead, Fast Follower or Sceptic? Make a decision



Continue to refine traditional technologies, wait for capacity to evacuate & define a path?



Determine the risk tolerance within the organization to lead technology & development into new, unproven areas?



Industry Forecast - Summary



- Shift of players (OEMs), platforms and structures are altering market opportunities.
- Growth of Mexico has moderated significantly – driven mainly by trade and political threats.
- BEV growth is driven by compliance and the need to drive technology leadership – not profitability.
- Global OEMs are shifting focus from new engines and transmissions to top end modifications, incremental technology (with major capital) and a base development of the electrified propulsion portfolio.
- Number of opportunities is declining though content integration will rise significantly – propulsion, safety and ADAS.

Thank You

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