

AUTOMOTIVE

Presentation

E-Mobility

The Impact of Connectivity/Autonomous Driving on Electric Vehicles

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ihsmarkit.com

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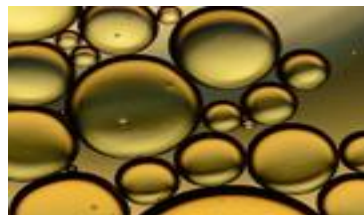
IHS Markit - Industries We Serve



Financial Markets



Energy



Chemical



Automotive



Aerospace,
Defense & Security



Product Design



Technology, Media
& Telecom



Maritime & Trade

Connecting to the Industries that Connect to Auto

FINANCIAL
**MEDIA &
COMMUNICATION**
HI-TECH
GOVERNMENT

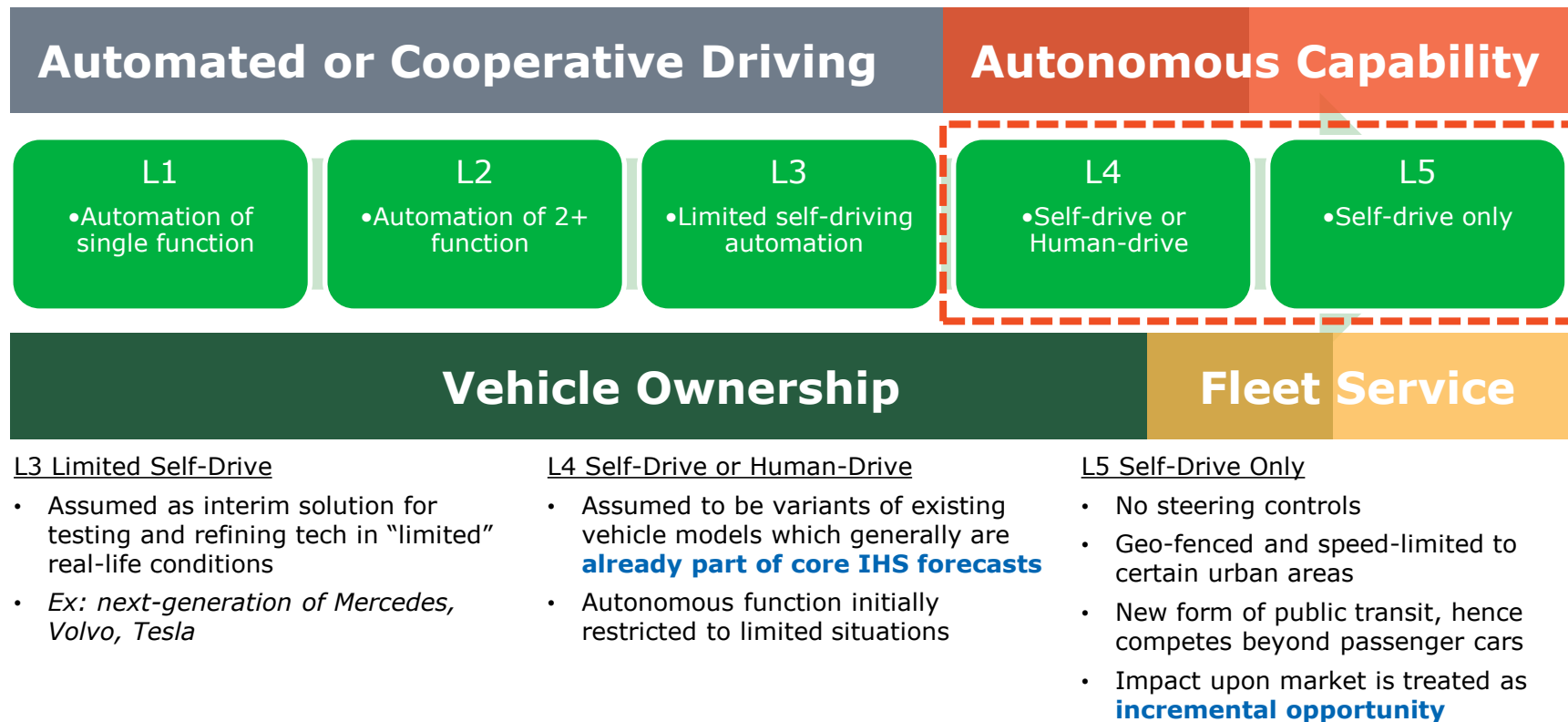


AUTOMOTIVE
MARITIME
AEROSPACE
& DEFENSE

ENERGY
CHEMICAL

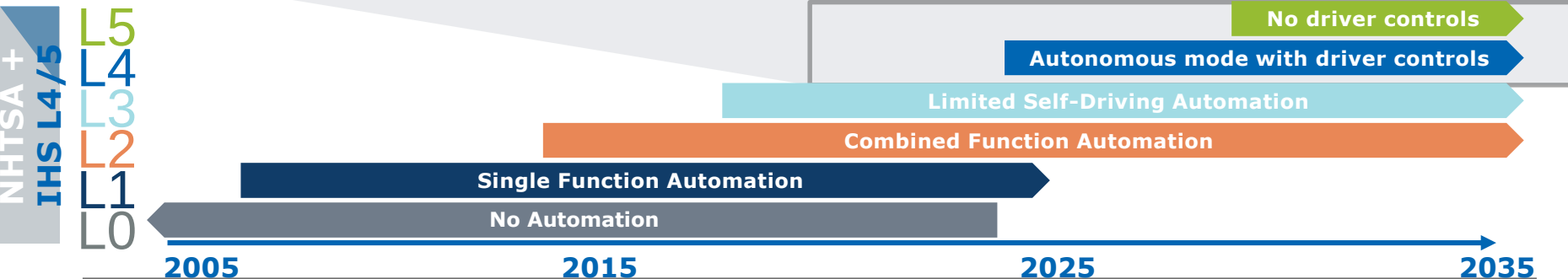
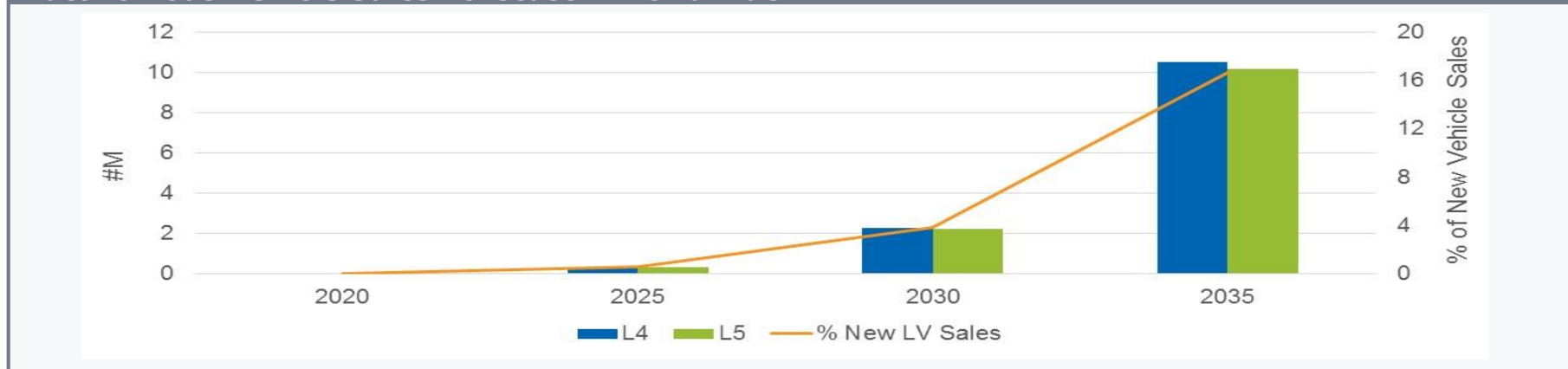


Understanding Levels of Autonomy



Autonomous Vehicle Forecast

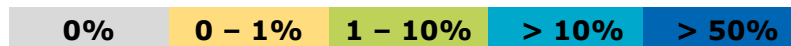
Autonomous Vehicle Sales Forecast – Worldwide



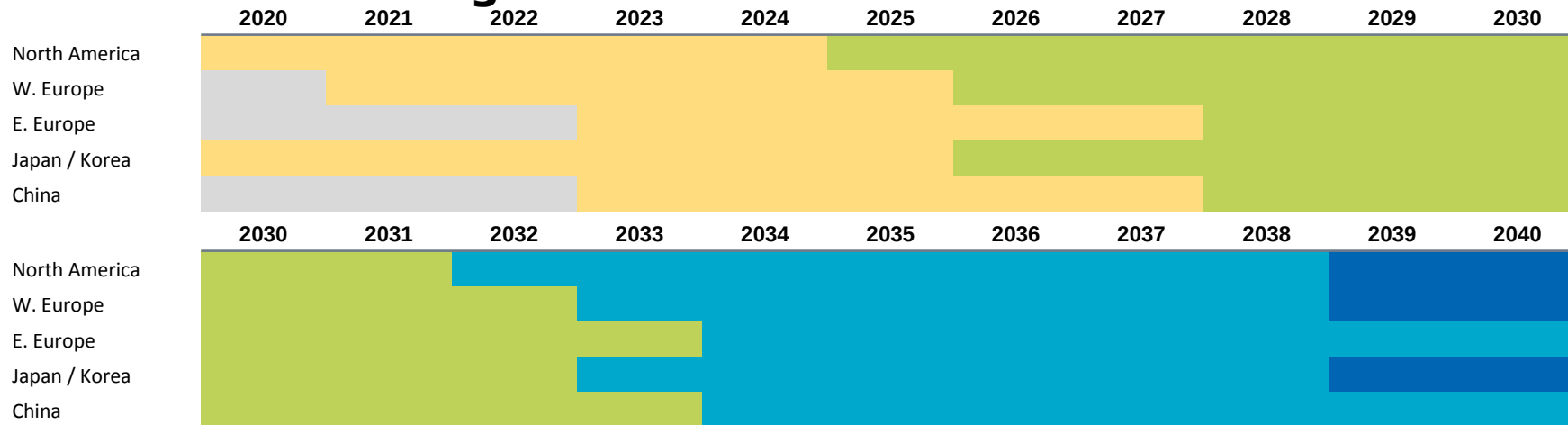
Autonomous Vehicle Deployment – Sizing at a Glance

L4 + L5 Autonomous Vehicle Volume

=



Current Total Passenger Vehicle Volume

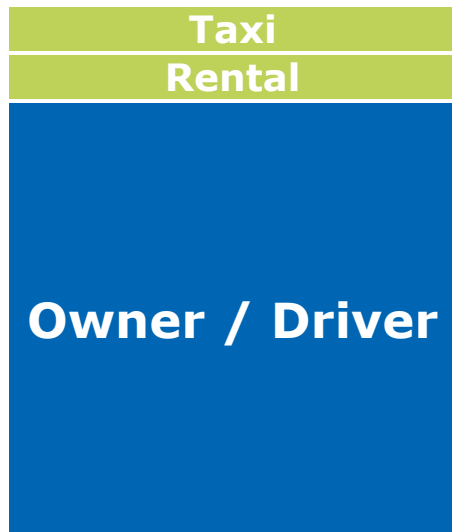


Market impact split between:

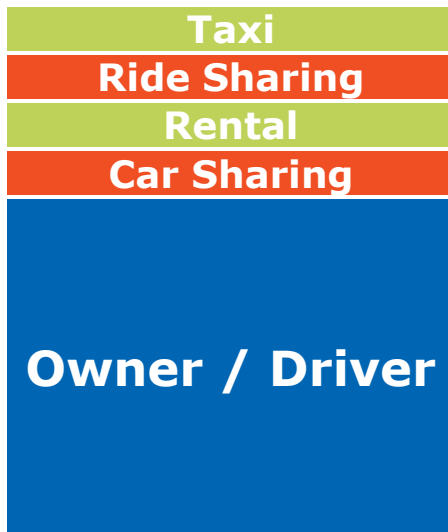
1. **Current** forecast volumes (“replacement” or “optional” technology) and
2. New incremental volume **beyond current** passenger vehicle forecast

Car-based Urban Mobility Reshaping Transportation

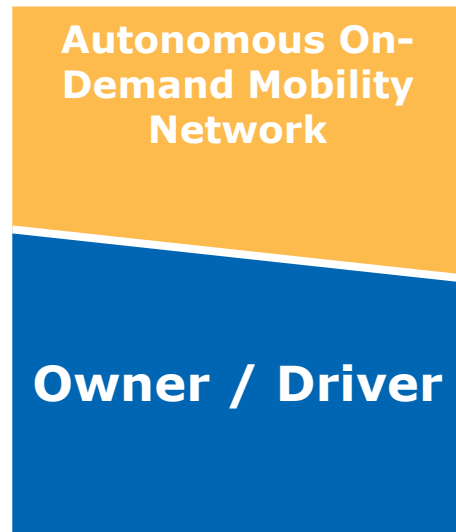
Past



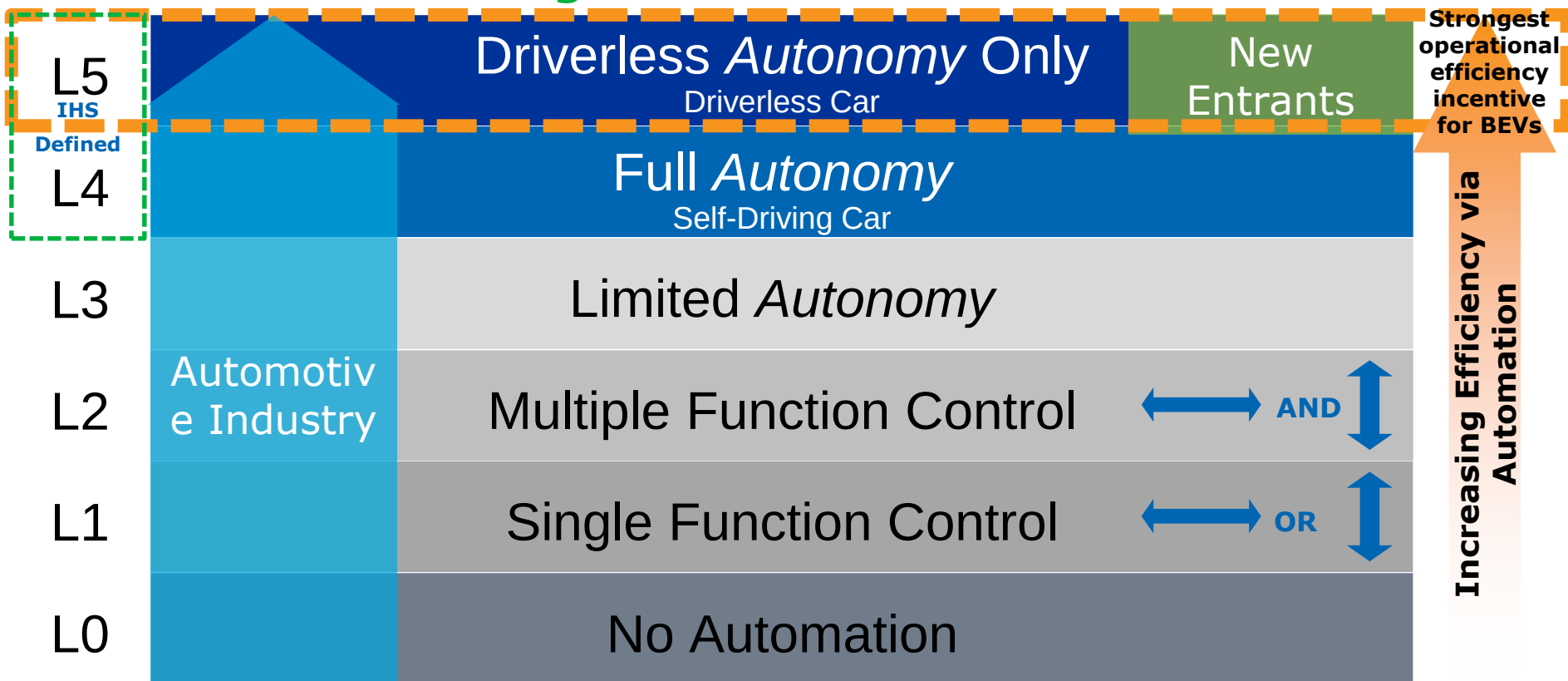
Present



Future



Automation Evolving



Autonomous Driving Causes Disruption

Autonomous Cars will cause massive disruption in the automotive market, especially on powertrains. AD, BEVs and Wireless Charging marry together. Disruption opens up the market.

Many Automaker Start Ups → Atieva, Faraday Future, NextEV, LeEco, Tesla... Focussing on 'high tech' (Autonomous Driving, Electric Powertrain, Software, UI/UX...).

ICE was a barrier to new competition, very high entry costs. Shift towards alternative propulsion, CO₂ & Emissions Targets.

The key is targeting the premium BEV sector. Tesla proved these vehicles sell.

Case Study: Why is Apple Looking at the Auto Industry?

Looking for other markets to expand into:

2015 Revenues: \$234B

iPhone Growth Slowing, Limited current product growth

Apple need BIG opportunities to grow

Auto Industry

Auto Sales: \$3,000B+ (slow growth)

Auto content value: \$20B+ (growing very fast)

Transportation: \$5,000B+ (new growth opportunities)

Changes in the Automotive Market:

Becoming Software-Centric (Apple Strength)

Becoming Connection-Centric (Apple Strength)

BEV lowers entry barriers (Apple Opportunity)

New Business Models: CaaS (Disruptive Opportunity)

Case Study: Why is Apple Looking at the Auto Industry?

What are the possible Apple Product Scenarios?

BEV Strategy 2020

**Luxury Self-Driving Car
connected and
leveraging Apple
products**

**Apple Hardware &
Software designed**

BEV & Self-Driving Car 2025

**Luxury Driverless Car
connected and
leveraging Apple
products**

**Apple Hardware &
Software designed**

BEV Far Out Strategy 2030

**Luxury Driverless Car
Local Manufacturing
(3D Printing?)**

**Apple Hardware &
Software designed**

Summary

- 5 Levels of Autonomy – L3 is the interim for testing and refining, L4/L5 is when the car can drive itself without the need for human input.
- Forecasts
 - 2025 is when we will start to see L4/L5 vehicles on the road.
 - In 2035, IHS Markit estimates that there will be ~20 million L4/L5 cars sold which is ~32% of new vehicle sales.
 - In Western Europe, it will take until 2040 before >50% of vehicles are L4/L5.
- Car-based Urban Mobility is reshaping transportation. Moving towards an Autonomous On-Demand Mobility Network (Car as a Service) and away from traditional car ownership.
- Autonomous Driving will cause disruption in the market. L5 Autonomous Driving presents the strongest operational efficiency for battery electric vehicles (and wireless charging).
- Disruption opens up the market to new players, new start-ups. Big opportunities – possible Apple scenarios.

Thank you for listening

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