



AUTO INDUSTRY TRENDS: ENERGIZING ASIA AND THE WORLD

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The last 12-24 months have provided consumers with a view of exciting developments under way in automotive technology and energized a new generation of automotive technologists and business people, in Asia and across the globe. Increasingly connected cars, enveloping in-vehicle infotainment experiences, mass-market vehicles, electric cars and after-market products and services present new business opportunities in the region and for export markets.

In this session, our panelists, all established industry analysts, will

- Highlight key trends and challenges in the Asian marketplace
- Compare automotive markets in Japan, China, South Korea, and India
- Examine how Asian automotive marketplace(s) differ from Europe and North America
- Describe the short and long-term potential of the connected car and autonomous vehicles in the region
- Look at new business opportunities (especially services) built on emerging vehicle capabilities

ASIA TRENDS: CN-JP-KR-IN

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- ▶ Auto Sales & Production
- ▶ USA-EU vs. Cn-Jp-Kr-In
- ▶ Connected Car Trends
- ▶ Autonomous Driving
- ▶ New Competition

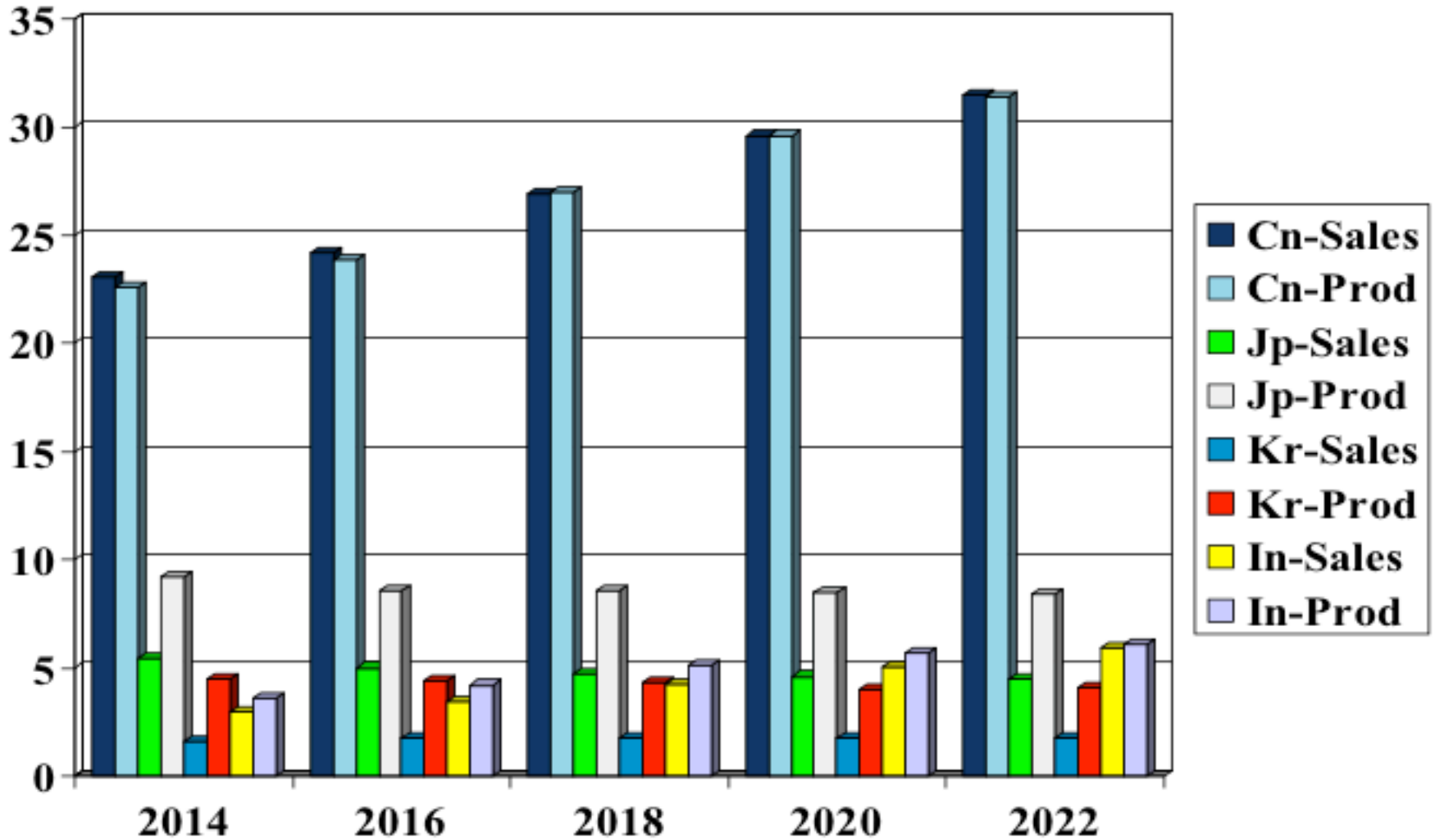
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IHS AUTOMOTIVE
driven by **POLK**

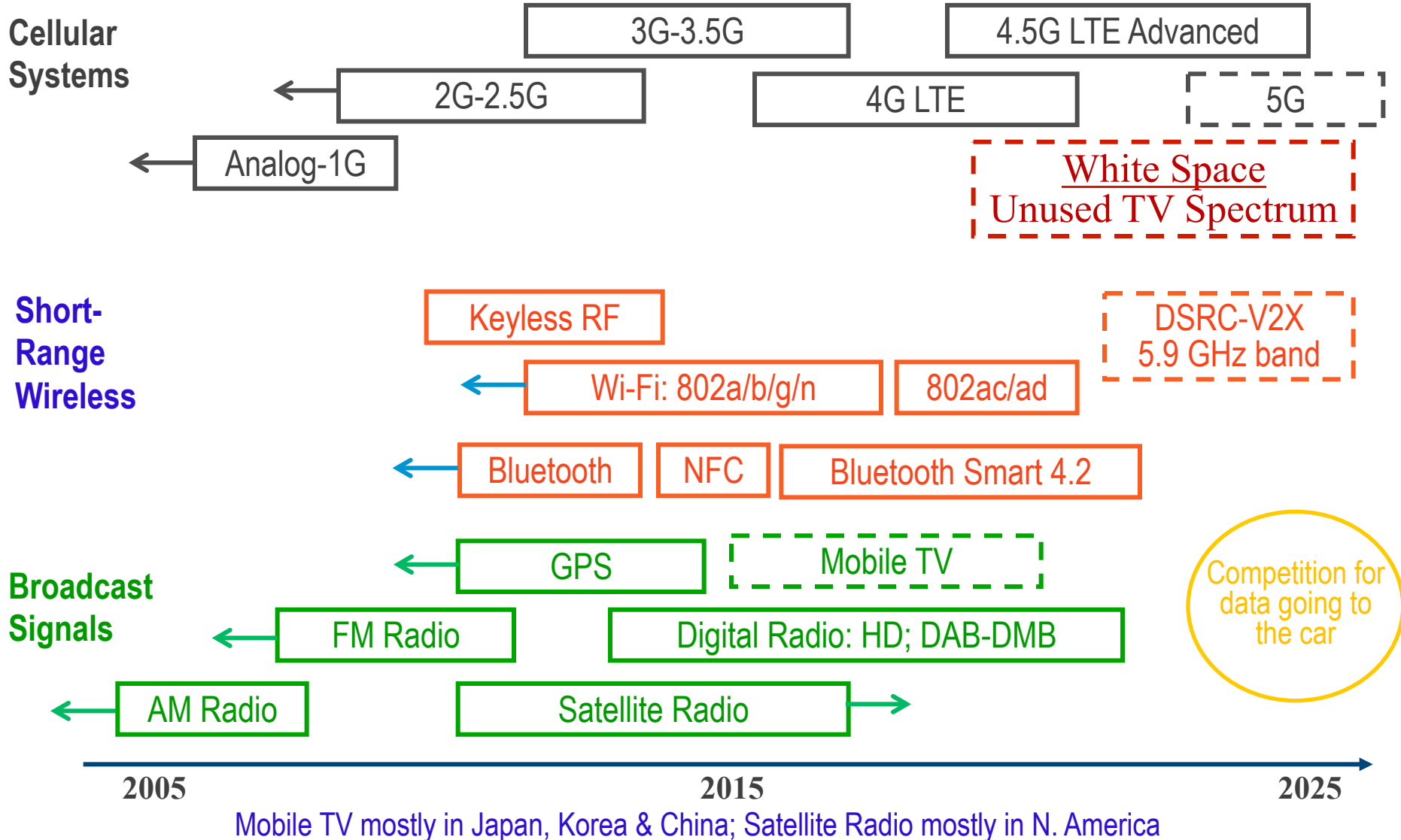


AUTO SALES & PRODUCTION



SOURCE: IHS Automotive

AUTO WIRELESS TECHNOLOGIES



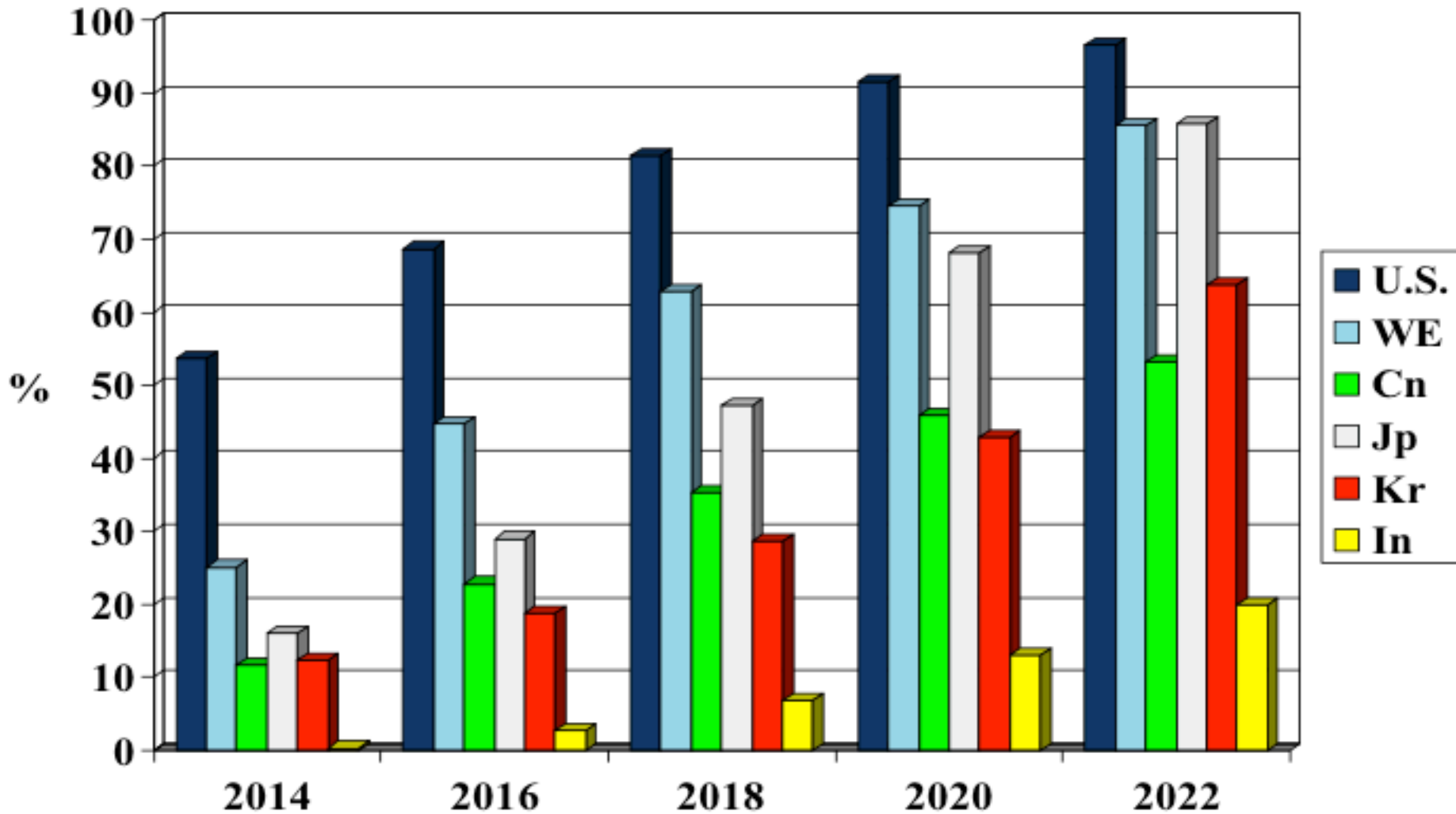
CONNECTED CAR TRENDS: U.S. & EU

	U.S. Trends	EU Trends
Embedded Telematics	<ul style="list-style-type: none"> ▶ Leading technology ▶ Remote diagnostic most valuable ▶ LTE deployment coming fast 	<ul style="list-style-type: none"> ▶ Waiting for eCall to fire up ▶ Mostly for high-end autos ▶ eCall main app
Smartphone Telematics	<ul style="list-style-type: none"> ▶ Ford success, followed by others ▶ Will leverage phone projection 	<ul style="list-style-type: none"> ▶ Limited success so far ▶ Success via phone projection
Embedded & SP	<ul style="list-style-type: none"> ▶ Growing rapidly ▶ Long-term winner 	<ul style="list-style-type: none"> ▶ Emerging in most countries ▶ Long-term winner
Phone Projection	<ul style="list-style-type: none"> ▶ Very important in next 5 years ▶ CarPlay & Android Auto to lead 	<ul style="list-style-type: none"> ▶ Very important in next 5 years ▶ CarPlay, AA & ML to lead
OTA SW Update	<ul style="list-style-type: none"> ▶ Emerging for telematics ▶ Infotainment OTA is next ▶ Core ECU OTA emerging 	<ul style="list-style-type: none"> ▶ Emerging for telematics ▶ Mostly luxury brands ▶ Will may lag U.S. by 2-4 years
Cyber Security	<ul style="list-style-type: none"> ▶ Finally getting attention ▶ OEMs scrambling to catch up ▶ Laws & regulation on the way 	<ul style="list-style-type: none"> ▶ Strong R&D, little deployment ▶ Orderly deployment coming ▶ Laws & regulation expected

CONNECTED CAR TRENDS: U.S. & A-P

	U.S. Trends	AP Trends
Embedded Telematics	<ul style="list-style-type: none"> ▶ Leading tech approach ▶ Remote diagnostic most valuable ▶ LTE deployment coming fast 	<ul style="list-style-type: none"> ▶ Leading approach in China ▶ Weak in most other regions ▶ LTE emerging first in China
Smartphone Telematics	<ul style="list-style-type: none"> ▶ Ford success, followed by others ▶ Will leverage phone projection 	<ul style="list-style-type: none"> ▶ Leading approach in Japan ▶ Future growth in China
Embedded & SP	<ul style="list-style-type: none"> ▶ Growing rapidly ▶ Long-term winner 	<ul style="list-style-type: none"> ▶ Grows with Smartphone ▶ Long-term winner in most areas
Phone Projection	<ul style="list-style-type: none"> ▶ Very important in next 5 years ▶ CarPlay & Android Auto to lead ▶ Qs: MirrorLink? AppLink-SDL? 	<ul style="list-style-type: none"> ▶ CP & AA important in Jp & Kr ▶ CarLife important in China ▶ China Qs: Local AA? ML? SDL?
OTA SW Update	<ul style="list-style-type: none"> ▶ Emerging for telematics ▶ Infotainment OTA is next ▶ Core ECU OTA emerging 	<ul style="list-style-type: none"> ▶ OTA to be important in Jp & Kr ▶ Cn: GM, BMW etc. to lead ▶ AP may lag U.S. by 3-5 years
Cyber Security	<ul style="list-style-type: none"> ▶ Finally getting attention ▶ OEMs scrambling to catch up ▶ Laws & regulation on the way 	<ul style="list-style-type: none"> ▶ Getting attention in Jp & Kr ▶ Need attention in Cn & In ▶ Laws & regulation expected

CONNECTED CAR ATTACH RATE



Includes connected car services via embedded modem, Smartphone & both

CONNECTED CAR REVOLUTION

Capabilities

Connected cars are the halfway point on a journey from simple and rare telematics use, to self-driving cars with required, multiple and constant connections over secure wireless links

Connected SDC

- 5G: Gbps
- Secure connections
- Any apps & content
- Connections: Required
- Driverless cars
- Car-as-a-Service

LTE Connected

- 4G LTE: Mbps
- Multiple connections
- Apps & cloud content
- Connections: Common

Telematics

- 1G Analog
- Speed: Kbps
- Safety-Security
- Available: Rare

Connected cars create new challenges. Auto industry must add cyber-security protection

2000

2015

2030

Kbps-Mbps-Gbps=Kilo-Mega-Giga bits per second; SDC=Self-Driving Car



AUTONOMOUS DRIVING EVOLUTION

CaaS Era

L5 DLC: No Driver Controls

Restricted Testing

Small-Scale, Low-Speed CaaS

CaaS Low-Speed Dep.

Full Deployment

L4 SDC: With Driver Control

Restricted Testing
Google, OEMs & T1s

Small-Scale Deployment

Volume Deployment

Full Deployment

L3

Auto Pilot: Highway

L3

Auto Pilot: Parking

L3

Auto Pilot: Traffic Jam

L2

Traffic Jam Assist

L1

Autonomous Braking

L1

Lane Keep Assist

L1

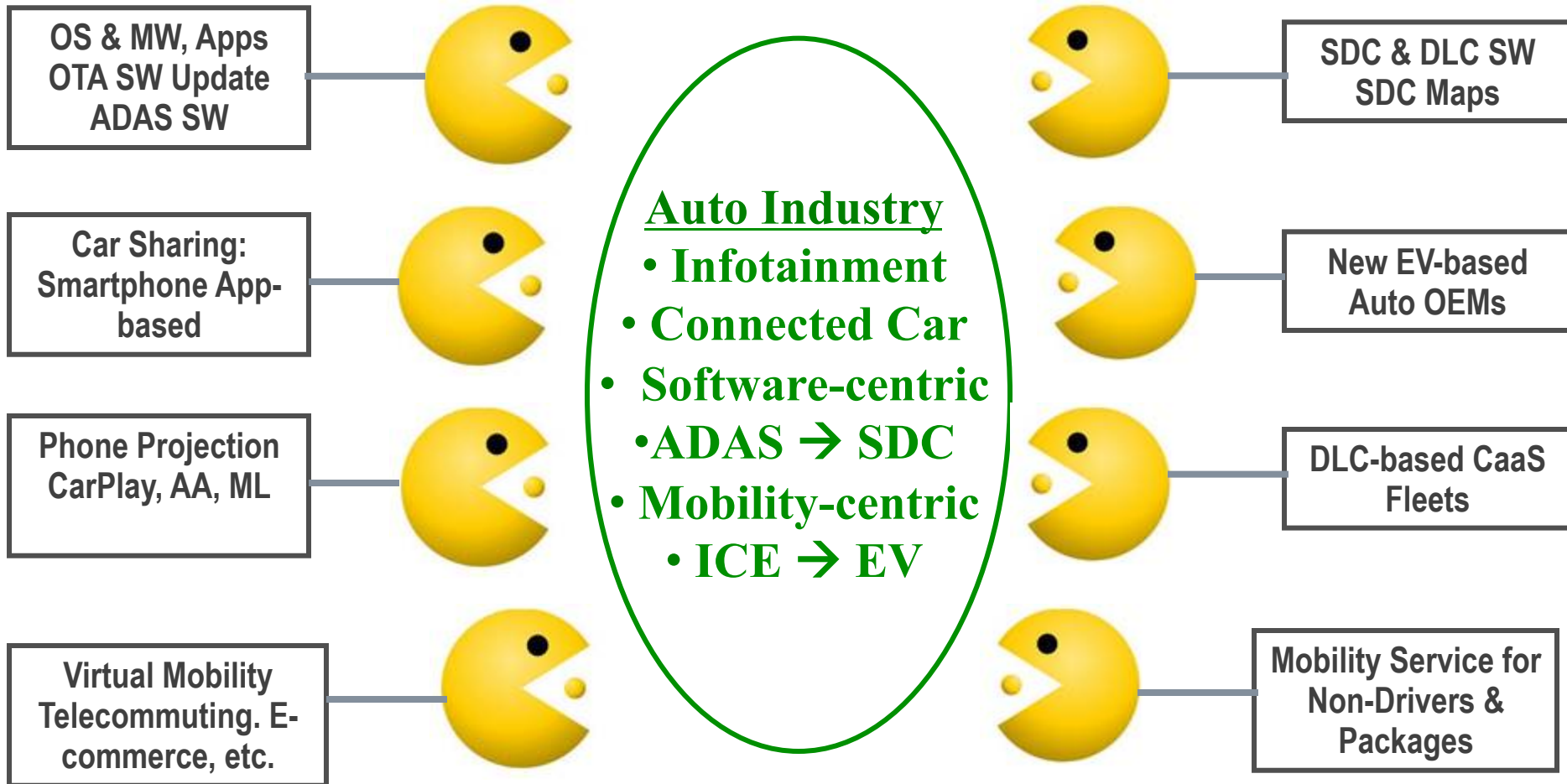
Adaptive Cruise Control

L0

Driver Assist Warning

2010 2015 2020 2025 2030

NEW AUTO INDUSTRY COMPETITION



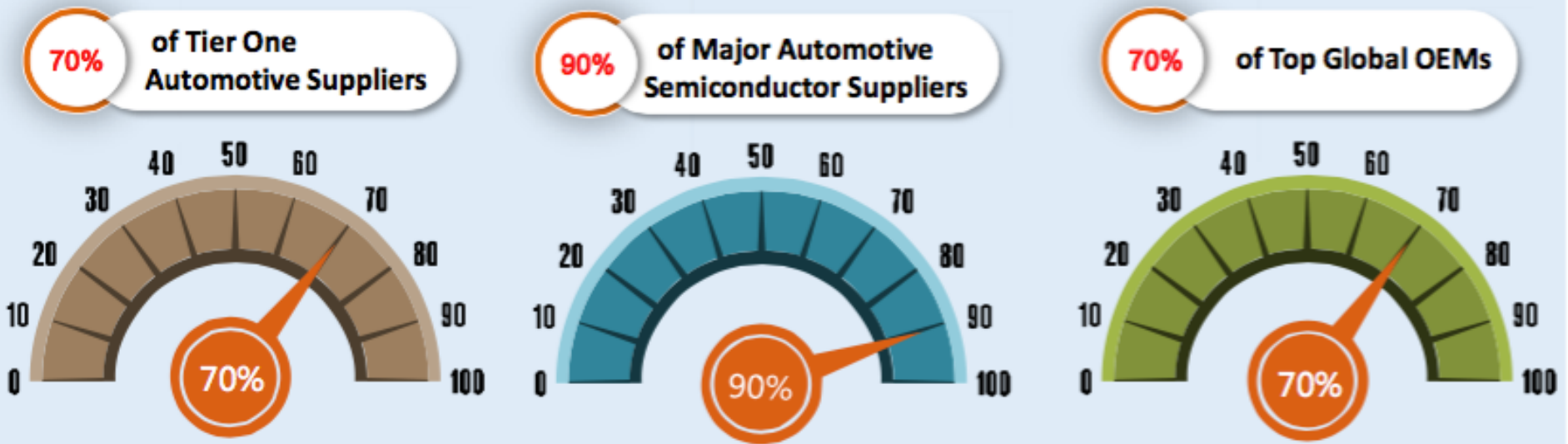
OS=Operating System; MW=Middleware; OTA=Over-the-Air; ICE=Internal Combustion Engine; SW=Software;
SDC=Self-Driving Car; DLC=Driverless Car; CaaS=Car-as-a-Service; AA=Android Auto; ML=MirrorLink

AUTO INDUSTRY CHALLENGES

Kevin Li, Senior Analyst
Automotive Multimedia & Communications

STRATEGY ANALYTICS-AUTOMOTIVE PRACTICE- EST.1988

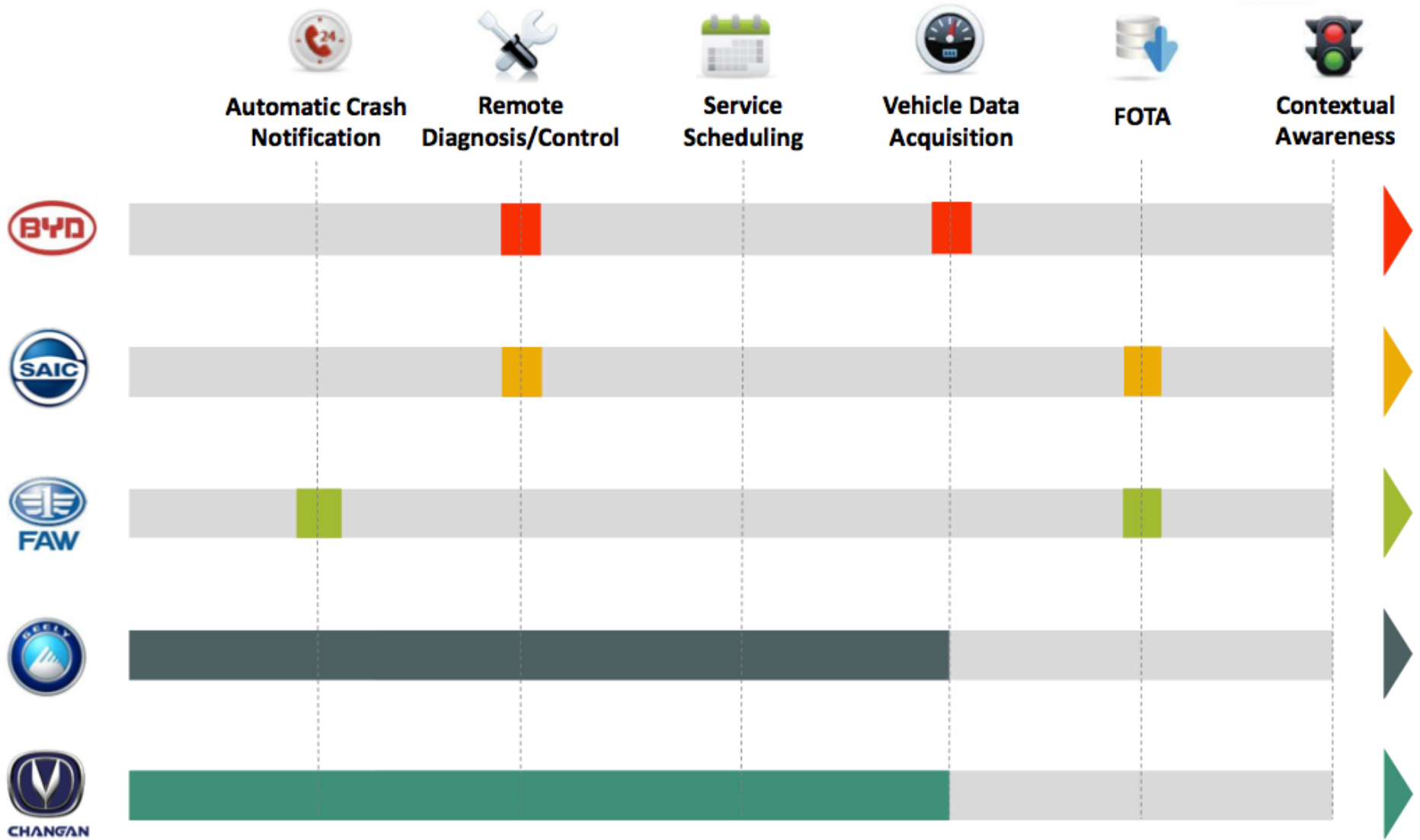
LEADING-NAME CLIENTS ACROSS THE VALUE-CHAIN



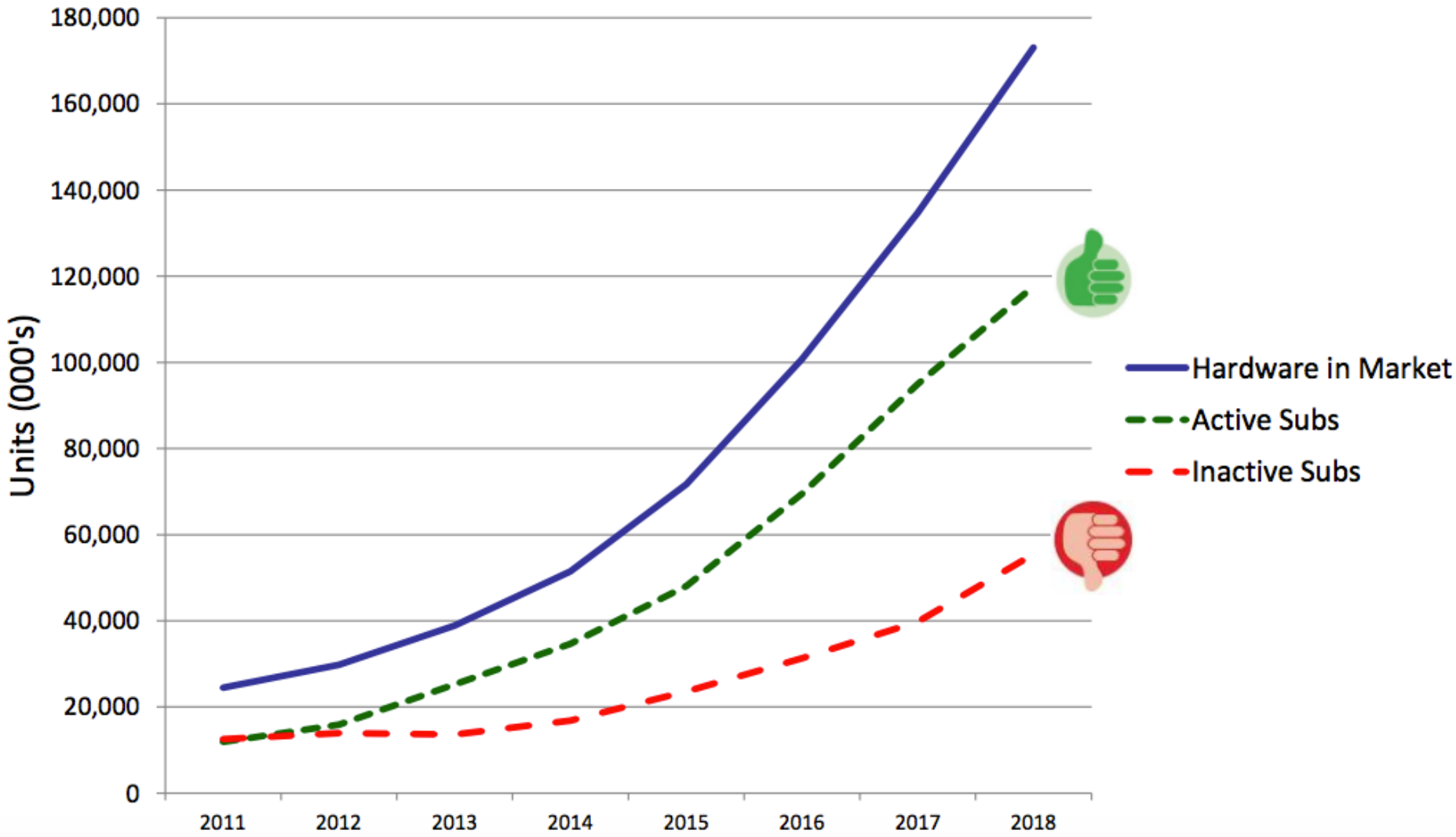
FOUR SERVICES TO COVER ALL AUTOMOTIVE OPPORTUNITIES

Powertrain, Body, Chassis & Safety	Infotainment & Telematics	Autonomous Vehicles	In-Vehicle UX
<ul style="list-style-type: none">• Powertrain• Chassis• Safety• Body/Security	<ul style="list-style-type: none">• Audio/Video/Nav• Telematics• Connectivity• HMI	<ul style="list-style-type: none">• ADAS to Autonomous• Components• Software• Connectivity	<ul style="list-style-type: none">• Behaviour & Attitudes• Surveys• HMI/Driver Distraction• System Benchmarking

INDUSTRY CHALLENGES: CHINA CONVERGENCE OF INFO-TELEMATICS & SAFETY



IN-ACTIVE SUBSCRIPTIONS(CUMULATIVE) OEM EMBEDDED TELEMATICS – GLOBAL



KEY BULLET POINTS

1 Opportunities for smartphone connectivity solutions

- The biggest opportunity lies in the relevance of the app to the driver and the compatibility of the solution
 - Some domestic OEMs in China tend to have smartphone connectivity as the only telematics solution for its low end models
 - Customer awareness of smartphone connectivity solution is low in China, but it will be booming very soon
-

2 The value of the telematics services

- Major value of the embedded telematics services belongs to the OEMs: safety (e-call), security (FOTA) and CRM (customer care)
 - Smartphone is being used to build close ties with the customer: smartphone app-remote control and keep customer informed, smartphone connectivity-individual contents brought-in
-

3 Challenges & opportunities both lie in aftersales market in China

- Government gives more power to 3rd repair stores in the name of breaking industry monopoly
- Internet companies will have stronger influence for the same quality of spare parts and standard services
- Traditional dealers will face the competition from the 3rd party repair stores as well as dealers of other OEMs

DISCUSSION

- What is the most vibrant attribute of the Korean auto market?
- How does the Asian automotive marketplace differ from Europe and North America
- How do internal market requirements create different drive experiences from vehicles exported to foreign markets?
- Which ecosystem players will dominate the connected car market in Asia?

- How are Asian OEMs and Tier 1s viewing open source s/w?
- Will Asian markets embrace autonomous vehicles sooner or later than N.A. and European markets?
- How are Asian auto makers reacting to increasing security threats?



AUDIENCE Q&A

