

# BRING A NEW ERA IN MOBILITY



**HL Klemove**

# HL KLEMOVE SNAPSHOT



2021 Sales:  
**US\$ 1.1B**  
KRW 1,216 B



CAGR('17-'21) of total sales:  
**10.7%**



Employees:  
**1,868+**



Countries with  
HL Klemove technology  
**184**



**49** in **12**  
Customers Countries



**4**  
Global manufacturing sites

**537** in **9**  
R&D engineers R&D sites globally



**31**  
ADAS features in the market

# CEO MESSAGE

The recent C.A.S.E (Connectivity, Autonomous, Shared, and Electrification) megatrend has brought new challenges to the automotive industry, calling for transformation.

Therefore, HL Klemove is set to make a big step towards strengthening its positions as an autonomous driving and mobility industry leader. Driven by the solid capabilities of automotive electronics, our state-of-the-art autonomous driving technologies incorporate advanced sensors and S/W algorithms.

Being an industry leader, we are committed to reacting to fast-changing trends with agility to accelerate qualitative growth and consolidate our leadership in the market by regional business expansion.

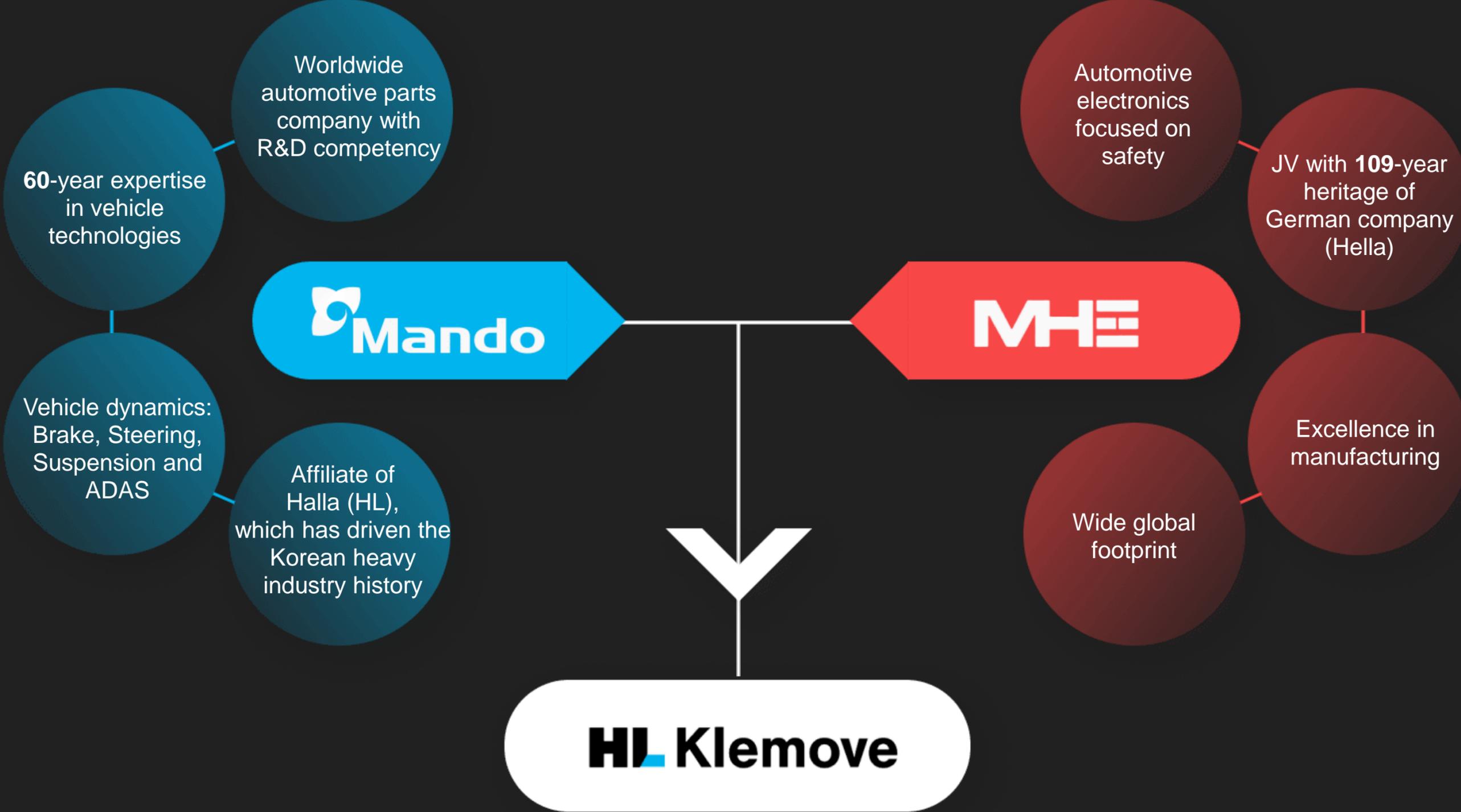
To manifest a world where your most comfortable movement becomes your safest moment, HL Klemove promises a new future based on the fundamentals of having a frontier spirit and “Jeong do” management, moving towards creating more values for our customers and global communities with "Clever Move".

Sincerest Regards,

HL Klemove CEO  
Pal-Joo, Yoon



# HL KLEMOVE HERITAGE



# HL KLEMOVE ESTABLISHMENT



**C**onnectivity



**Autonomous**

Accelerate the growth of the autonomous driving business through **optimized resource management**



**S**hared

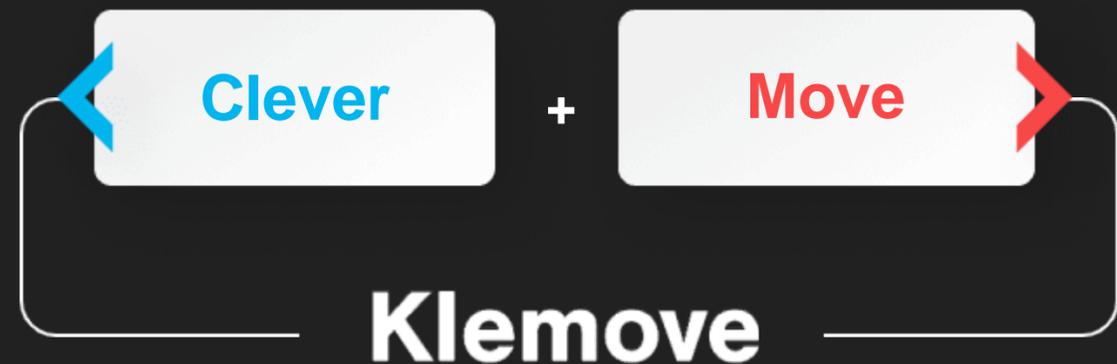


**Electrification**

Full **value chain internalization** through integration with Mando ADAS and MHE

**HL Klemove aims to promote more expertized and optimized business operation in the mobility area by utilizing differentiated business capabilities, strategies, investment priorities, organizations and partnerships**

# BRAND IDENTITY: FORESIGHT



To move ahead in a clever way, we need to have a “**Foresight**” in technical and management domains.

From an automobile parts company, we will strengthen our position as an innovative pioneer in autonomous driving, AI and fully automated mobility.

## HL Klemove

MISSION

To manifest a world where Your most comfortable movement is Your **Safest moment**

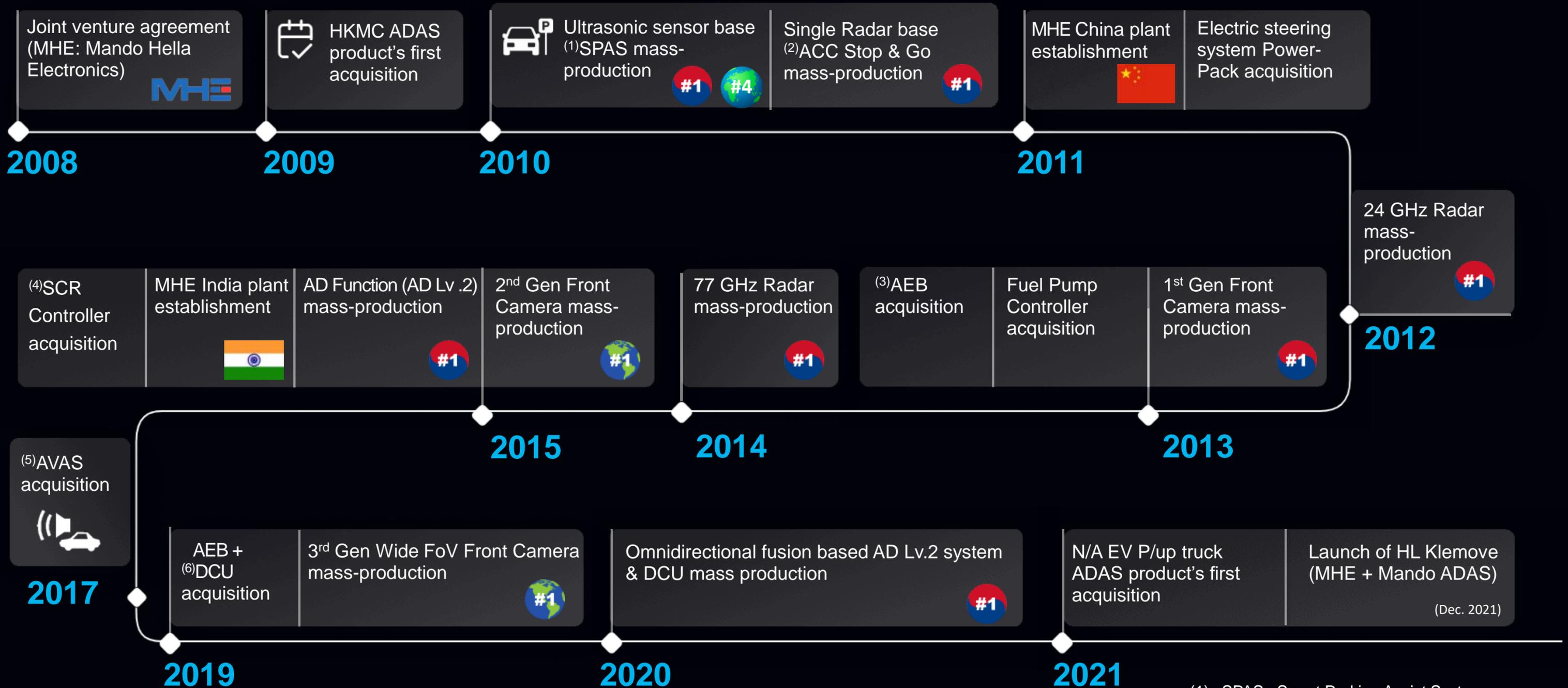
GOAL

The most **Trusted** company in Intelligent Mobility

BRAND IDENTITY

**Foresight**

# HL KLEMOVE FOOTPRINT



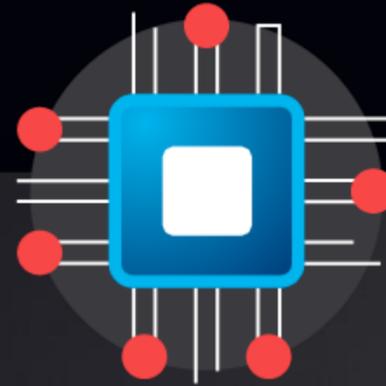
- (1) SPAS : Smart Parking Assist System
- (2) ACC: Active Cruise Control
- (3) AEB: Autonomous Emergency Braking
- (4) SCR: Selective Catalytic Reduction
- (5) AVAS: Acoustic Vehicle Alert System
- (6) DCU: Driving Control Unit

# BUSINESS AREAS



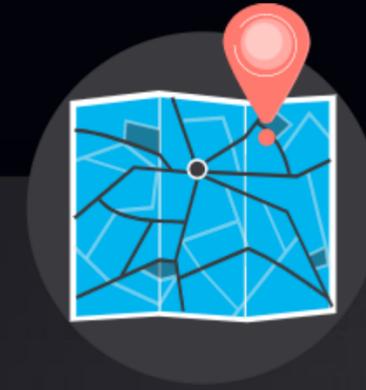
## Autonomous Driving

- Autonomous driving solutions
- Active safety solutions
- In-cabin sensing solutions



## Automotive Electronics

- Automotive electronics solutions
- <sup>(1)</sup>AVAS solution for xEV
- Fuel & Urea controller
- <sup>(2)</sup>EMS (focusing on safety-related products)



## Mobility Platform

- Robot platform
- Data solutions

**HL Klemove's autonomous solutions and innovations are aimed to manifest a world where your most comfortable movement is your safest moment**

# GLOBAL PRESENCE

9

6

4

R&D sites

Sales offices

Plants

-  R&D
-  Plant
-  Vehicle Test
-  Sales office

## Europe

Arjeplog  

## Korea

Pan-gyo    
Pyeong-taek    
Song-do     
Hwa-seong 

## India

Bangalore   
Chennai     
New Delhi 

## China

Suzhou     
Heihe 

## North America

Detroit    
Silicon valley   
More location (2024) 

# R&D CAPABILITY & INVESTMENT

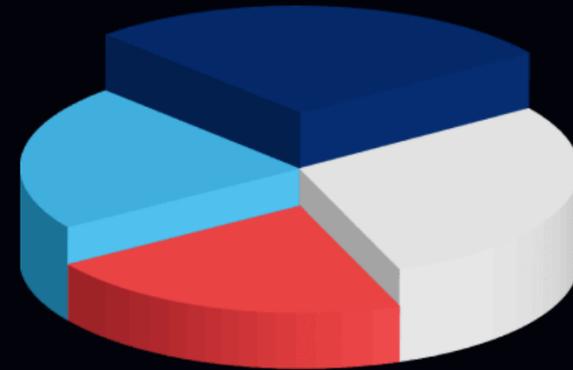
**7~8%** R&D / Sales

**233** Master's & Doctoral degree employees  
(21% of domestic workers)

**537** R&D engineers (33%) in  
9 R&D sites globally

(Dec. 2021)

- HL Klemove holds **2,040** patents and leads the innovation of future mobility



(3Q 2021)

**587** Domestic patent applications

**561** Domestic patent registrations

**453** Abroad patent applications

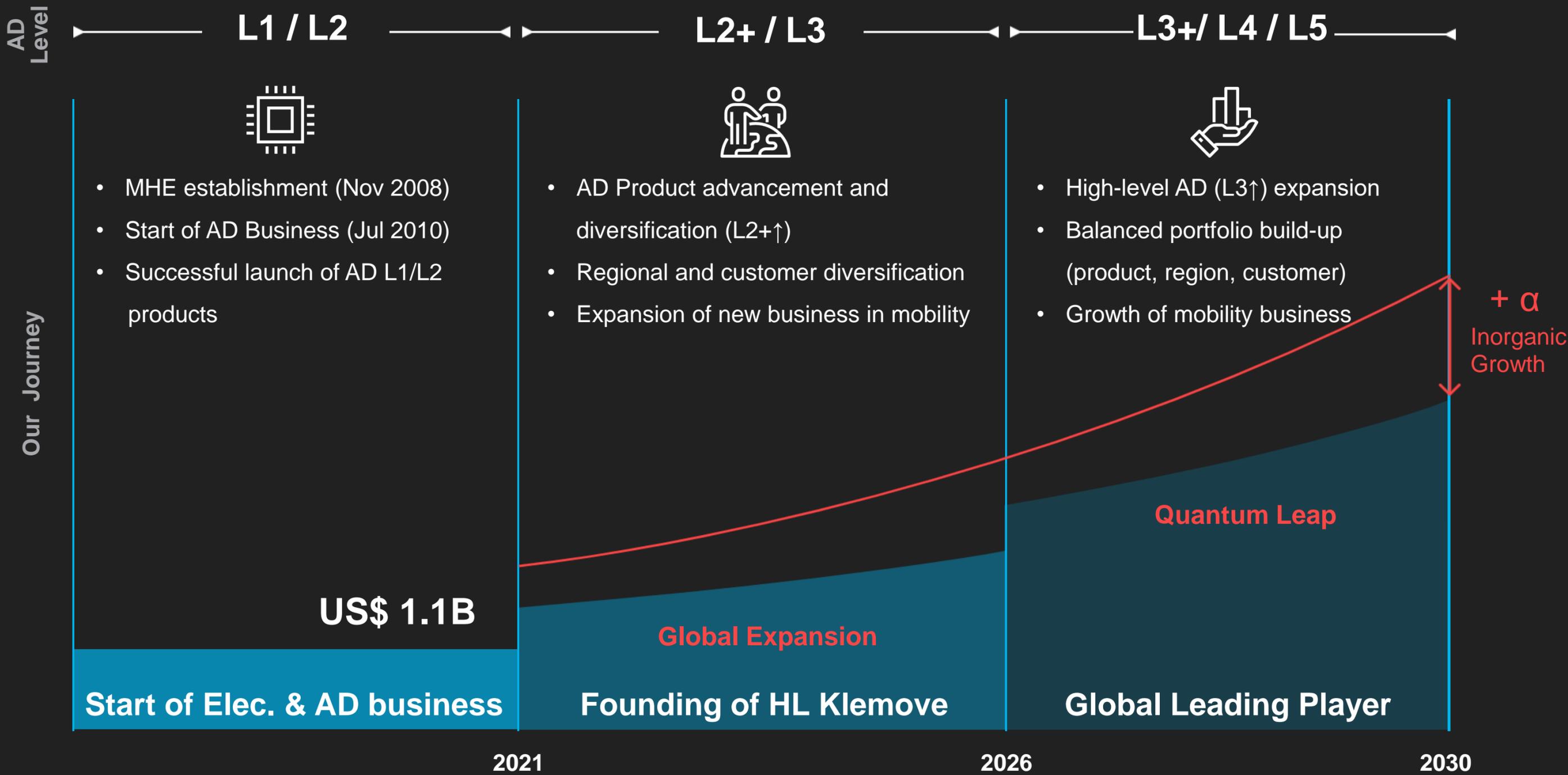
**439** Abroad patent registrations



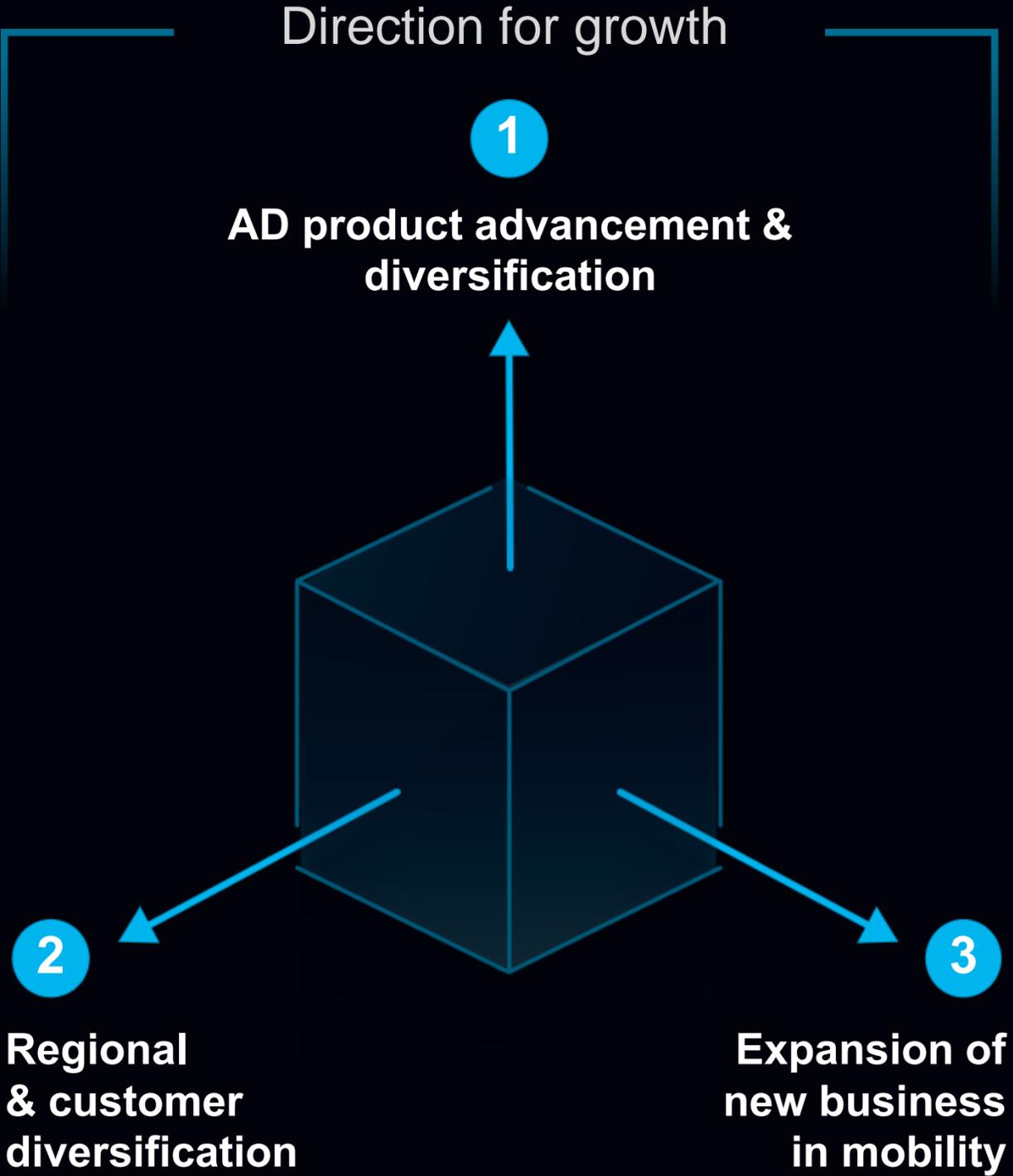
\*ICT Patent  
Management Award  
2020



# JOURNEY FOR SUSTAINABLE GROWTH



# GROWTH STRATEGY



- 1 **Full AD solutions provider**  
Responding to advanced AD trend
- 2 **Innovation with AD technology and SW/data solutions**
- 3 **Balanced regional and customer portfolio**

# WHY CUSTOMERS CHOOSE HL KLEMOVE



01  
**GLOBAL MARKET  
REFERENCE**



02  
**BEST  
PERFORMANCE**



03  
**EXPERTISE  
IN SENSORS**



04  
**AGILE  
SUPPORT**



05  
**MANUFACTURING  
EXCELLENCE**



06  
**RELIABLE  
PARTNERSHIP**

# PRODUCT OVERVIEW

## AUTONOMOUS DRIVING (HW/SW)

### Radar solutions

- Front
- Corner
- Ultra-short-range
- Imaging

### Camera solutions

- Front

### Lidar Solutions

- Solid-state

### Domain Control Solutions

- Driving

### In-Cabin Solutions

- Radar
- Camera

## AUTOMOTIVE ELECTRONICS

### ECUs

- AVAS
- SCR
- FPC

### Chassis Sensors

- TAS/TOS
- WSS
- Y&G

### EMS

- Brake ECUs
- Steering ECUs
- 2 Wheeler ABS ECUs

## MOBILITY PLATFORM

### Data Solutions

- Predictive Maintenance

### Service Solutions

- Service Application

# HL KLEMOVE SOLUTION BREAKDOWN



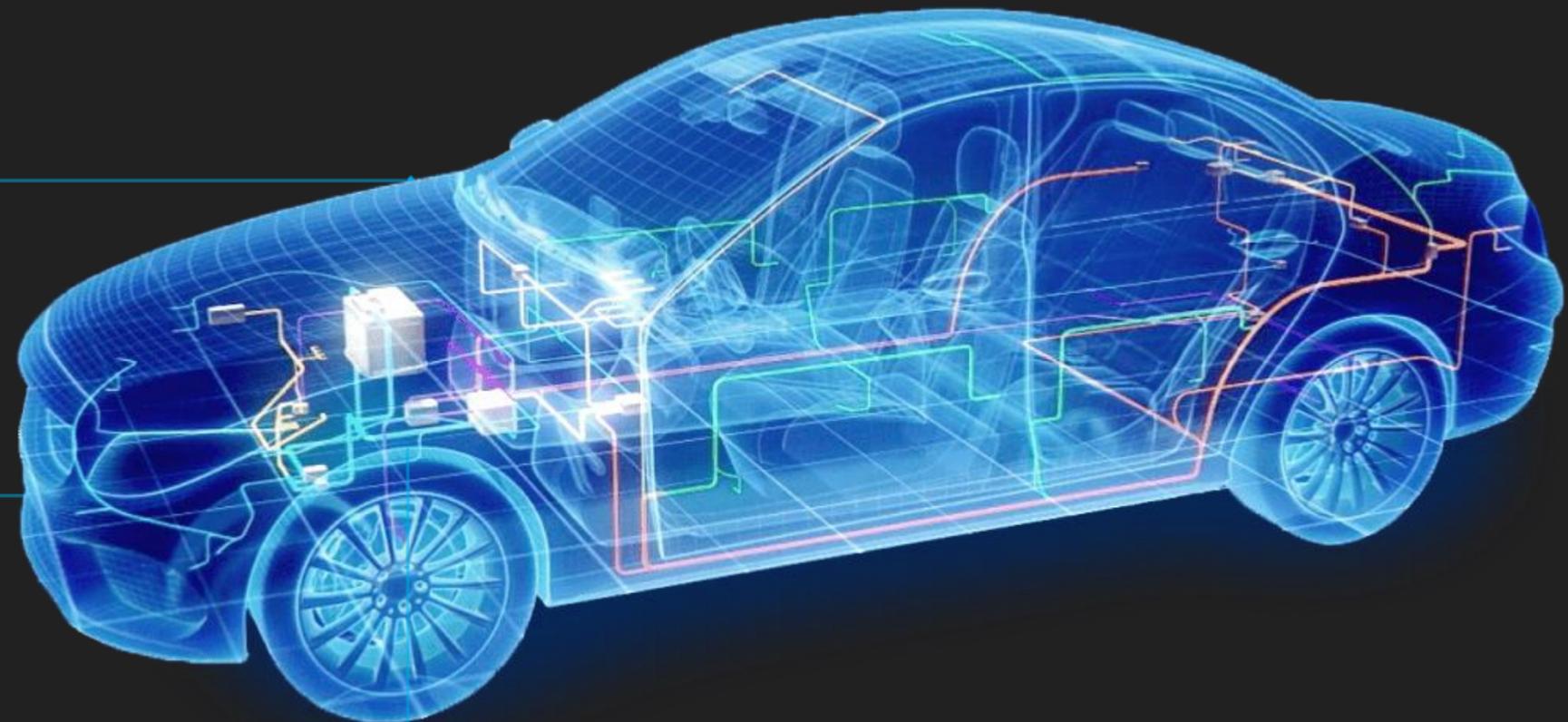
Sensor = Eye



Processor = Brain



Automotive electronics =  
Nervous system



## End-to-End Solutions for future mobility

From the very basic **electrical architecture** for various types of control units to **sensors** detecting both in and outside the mobility ecosystem and to **controllers** to process all the signals, HL Klemove has it all to build highly autonomous, emission-free, and richly featured mobility.

# KEY PRODUCTS

## 1) Autonomous Driving Solutions

### System Integration

### Klemove technology



### PERCEPTION

: Sensors with ADAS Features

#### Radar

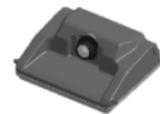


Front Radar  
*ACC/FCW/AEB*



Corner Radar  
*BSD/LCA/RCTA*

#### Camera



Front Camera  
*LDW/LKA/HBA/TSR/FCW/AEB*

#### Ultrasonic Sensor

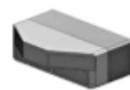


Long Range  
*IPAS*



Short Range

#### Lidar



Solid state lidar



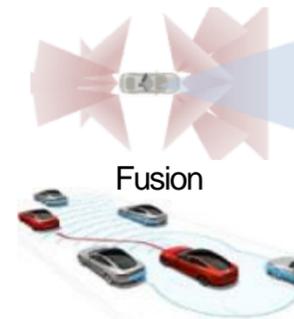
### DECISION

: DCU with Software

#### Software

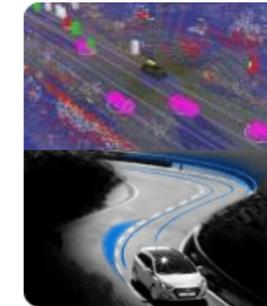


Perception



Fusion

Planning



Control

#### Hardware



Automated Driving Control Unit  
(ADCU)

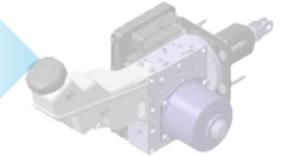


### CONTROL

#### ECU



#### Brake



#### ECU



#### Steering



#### ECU



#### Suspension

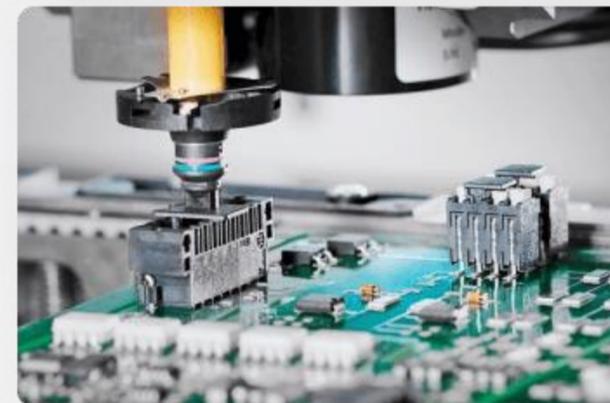
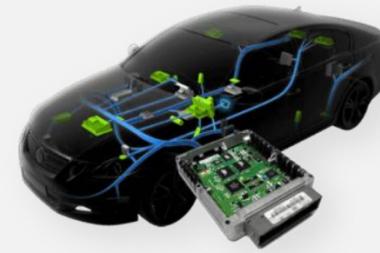


# KEY PRODUCTS

## 2) Automotive Electronics

All kinds of automotive electronics solutions, from design to manufacturing

- 1 **Vehicle dynamics control**  
Chassis control unit for braking & steering
- 2 **xEV virtual engine sound system**  
Alerting pedestrians to avert accidents
- 3 **Electronics manufacturing service**  
Built to print automotive electronics for Tier1/OEM
- 4 **Emission system control**  
Zero defects, reliable process



### Electronics



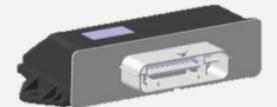
**Steering ECU**  
*for convenient steering*



**Brake ECU**  
*for safe braking*



**TOS/TAS**  
*for steering ECU*



**SCR ECU**  
*for SCR system*



**FPC ECU**  
*for Fuel pump system*

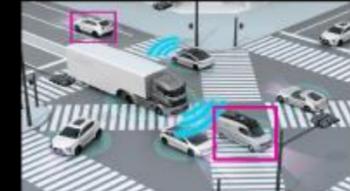


**AVAS**  
*for generating sound in xEVs*

# LATEST ACHIEVEMENT: GENESIS



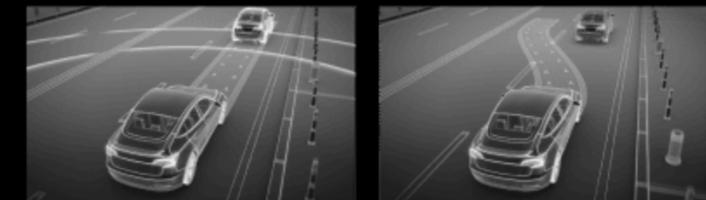
LDW, LKA, ELK-Roadedge, HBA, DDA



FCW, AEB –Car/Ped/Cyclist, AEB Plus, AEB-JT/JC  
ELK - Oncoming/ Overtaking, AES/ESA



ISA iACC



HWA 2.0 (LCS & ALC w/ACC)  
NICC, FVSA, ACC Stop & Go,

ACC : Adaptive Cruise Control	AEB : Autonomous Emergency Braking	AES : Autonomous Emergency Steering	ALC : Automatic Lane Change	DDA : Driver Drowsiness Alert	ELK : Emergency Lane Keeping
ESA : Emergency Steering Assist	FCW : Forward Collision Warning	FVSA : Front Vehicle Start Alert	HBA : High Beam Assist	NICC : Navi. Integrated Cruise Control	ISA : Intelligent Speed Assist
LCS : Lane Centering Steering	LDW : Lane Departure Warning	LKA : Lane Keeping Assist	iACC : Intelligent ACC	HWA : Highway Assist	

# BUNDLING AND SOURCING BENEFITS

Autonomous Driving Solution  
Provider,  
Giving **FREEDOM** to OEMs



## Development period reduction

- More than 3 months shortening (Ex: EBS-ADAS)
- Project delay risk reduction



## Coordination and workload reduction

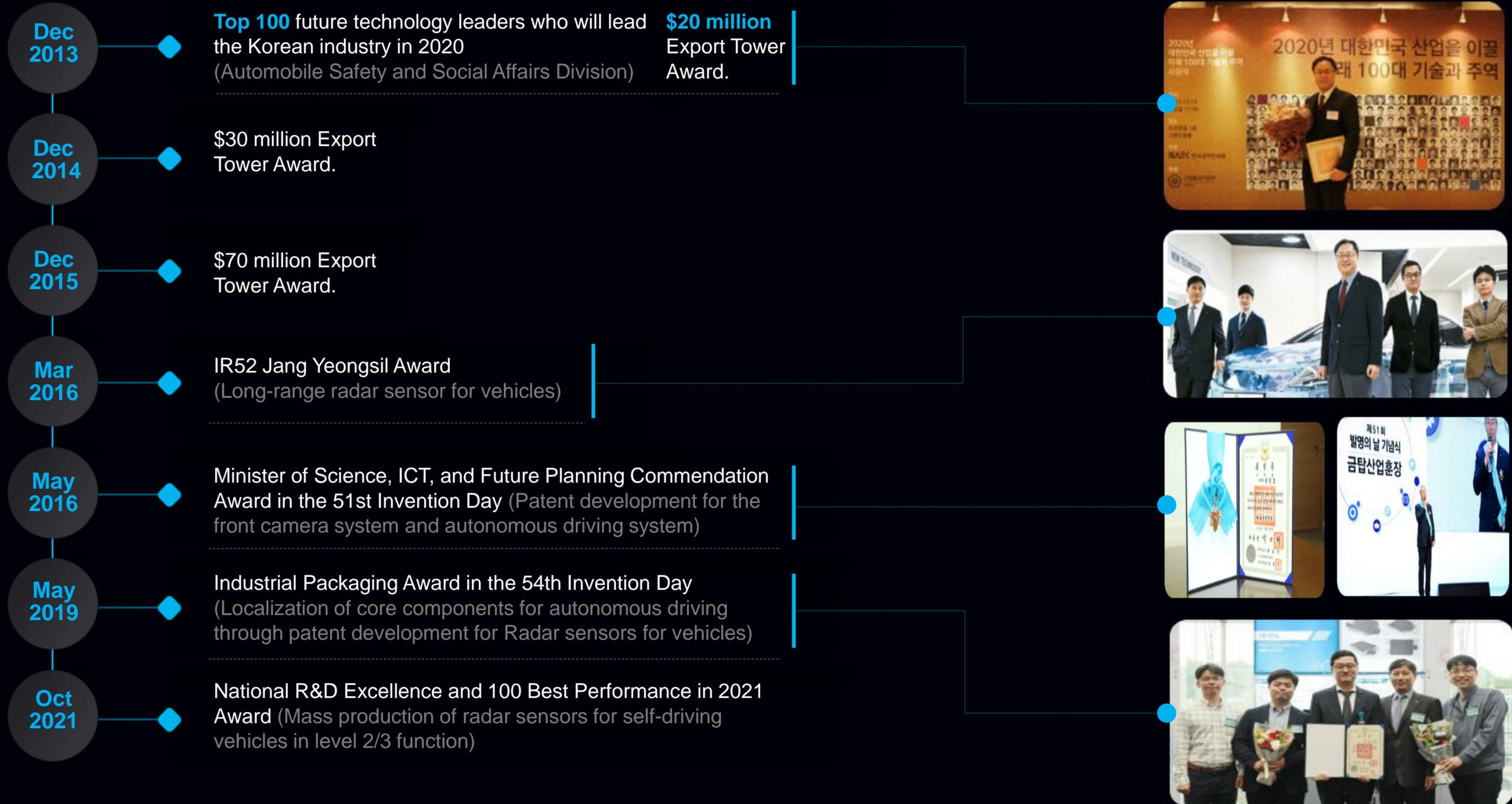
- Interface coordination/ change/ test handling workload reduction
- Responsible / Approval workload reduction



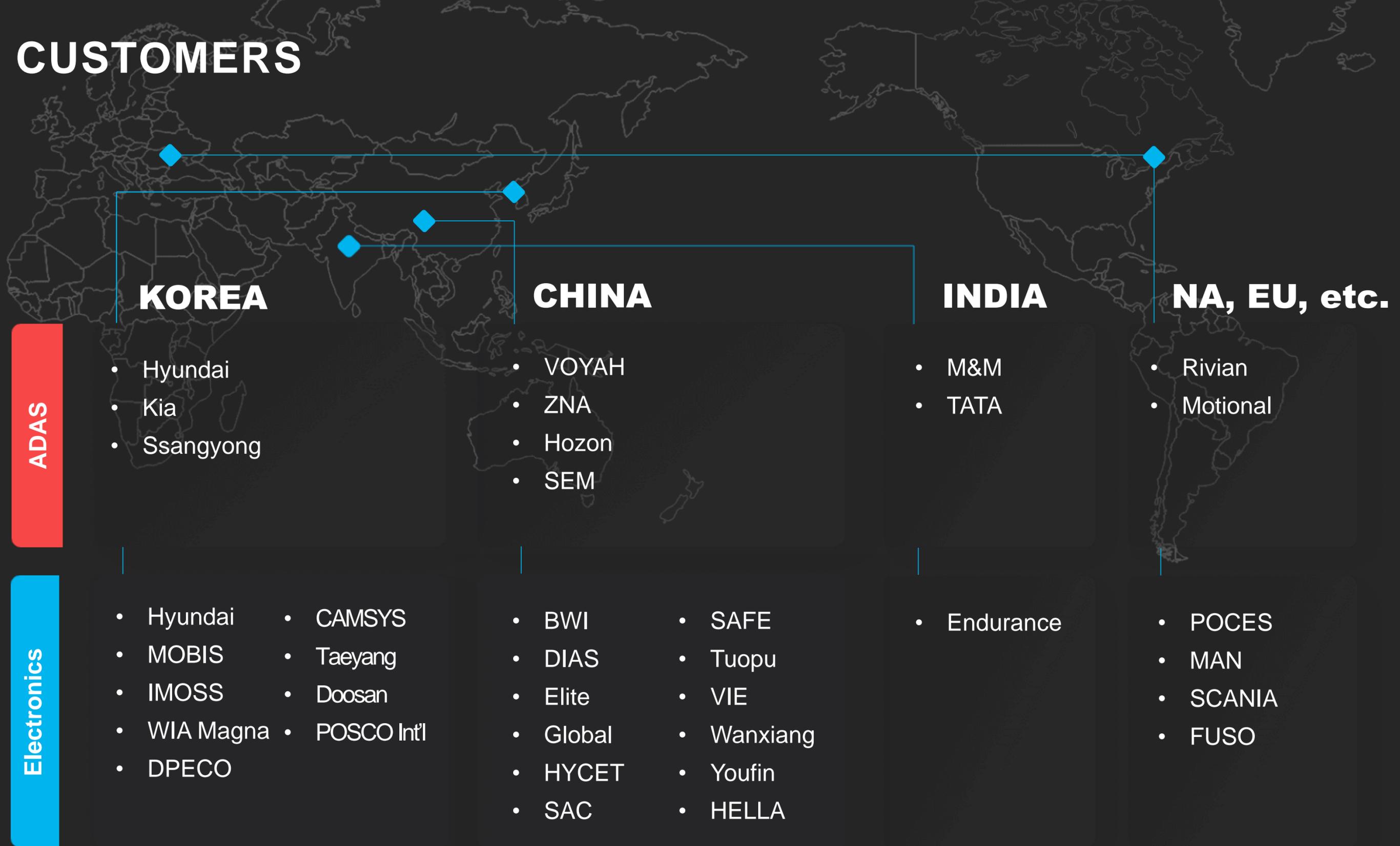
## Expertise in vehicle dynamics and AD

- Test vehicle building cost
- Test vehicle shipment cost

# AWARDS HISTORY



# CUSTOMERS

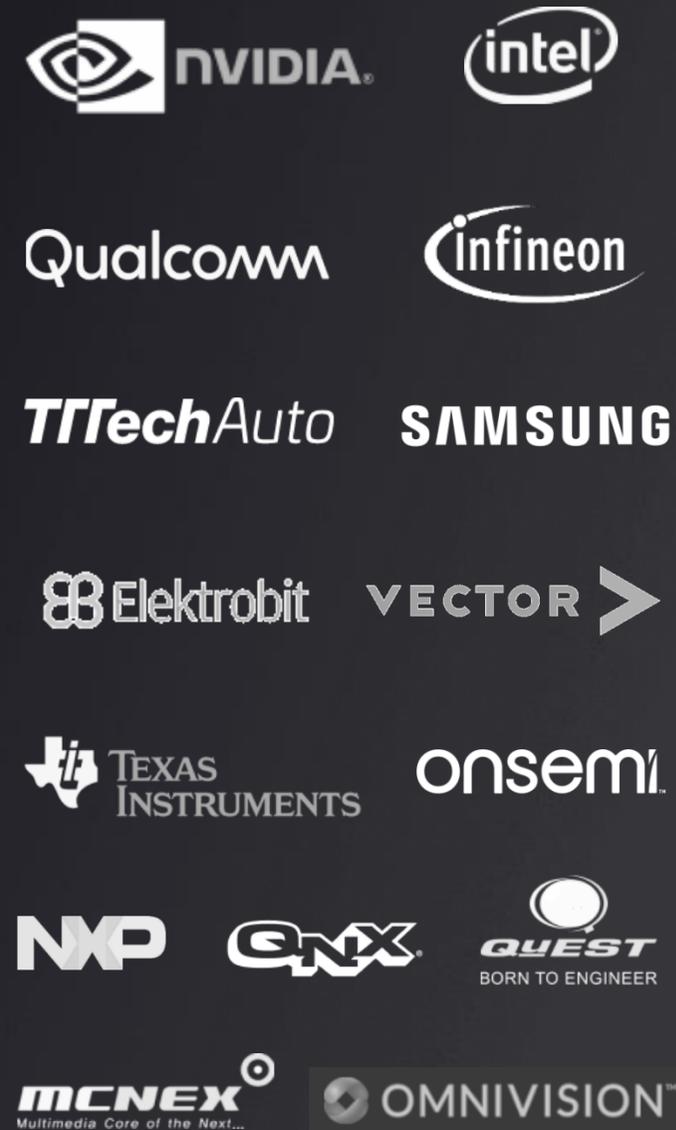


# PARTNERSHIPS

## Startups



## Key industry players



## Government

Diverse national projects with the affiliated agency

# CERTIFICATION

ISO/TS 16949



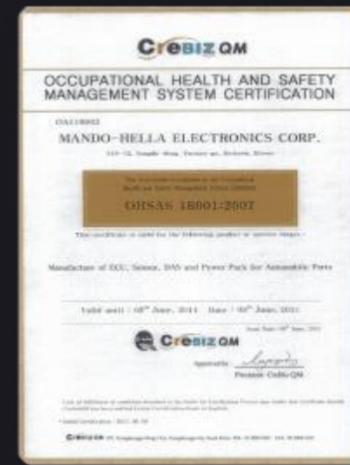
Nov '09 – Jul '18

ISO 14001



Jun '10

OHSAS 18001



Jun '11

ISO 26262



Aug '11

AD permission in KR and CA, USA

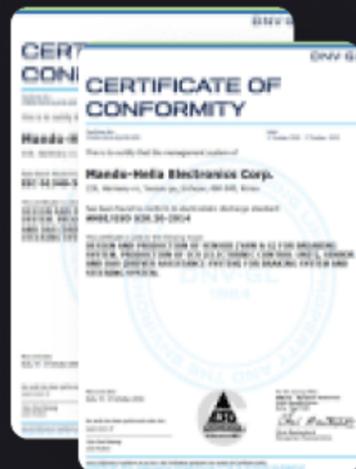


ISO 45001



Mar '21

ESD Cert.  
ANSI/ESD S20.20 & IEC 61340-5-1



Oct '18

IATF 16949



Jul '18

ASPICE CL2



Dec '13

HL Klemove is continuously improving all systems and aims to satisfy customers' expectations

# QUALITY & COMPETITIVENESS

## Safety Development



- Securing the development and quality based on the APQP process
- S/W verification using 3D virtual reality
- Use of pre-verification to confirm design specifications

## Safety Production



- Secure LOT traceability
- Continuous improvement through prediction and prevention
- Secure SMT soldering conditions based on IPC-A-610
- Potential risk reduction through the IQ-FMEA program

## Safety System



- Establishing the safety pre-response system
- Quick information sharing and compliance system
- Encouraging enterprise-wide quality management and strengthening capabilities



**“QUALITY” IS THE  
CORE VALUE AND GROWTH  
ENGINE OF HL Klemove**



# SUSTAINABILITY MANAGEMENT



# 6 MAJOR AREAS OF SUSTAINABILITY MANAGEMENT



01 Technological Innovation



02 Governance / Ethics



03 Human Rights - Safety



04 Environment



05 Supply Management

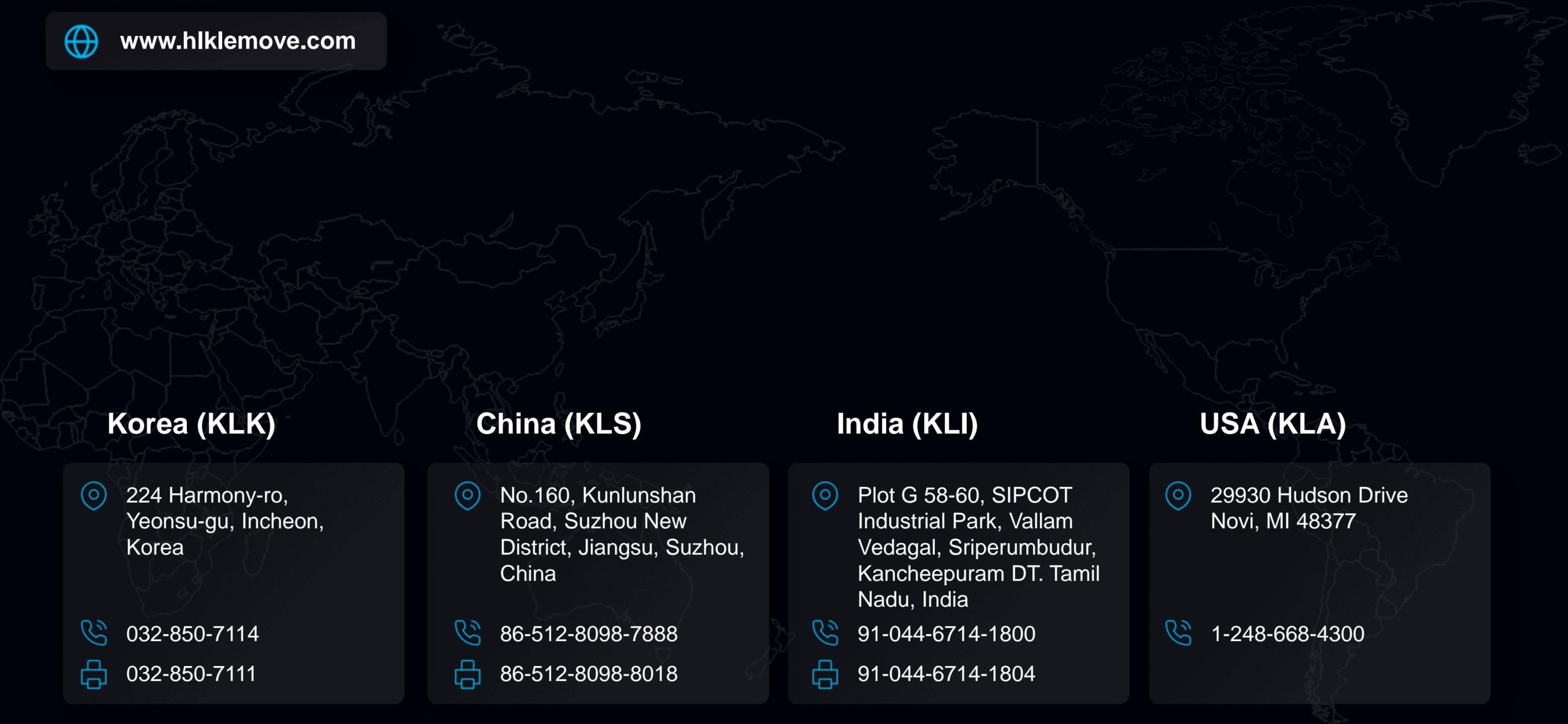


06 Social Contribution



# CONTACT US

 [www.hklemove.com](http://www.hklemove.com)



## Korea (KLK)

 224 Harmony-ro,  
Yeonsu-gu, Incheon,  
Korea

 032-850-7114

 032-850-7111

## China (KLS)

 No.160, Kunlunshan  
Road, Suzhou New  
District, Jiangsu, Suzhou,  
China

 86-512-8098-7888

 86-512-8098-8018

## India (KLI)

 Plot G 58-60, SIPCOT  
Industrial Park, Vallam  
Vedagal, Sriperumbudur,  
Kancheepuram DT. Tamil  
Nadu, India

 91-044-6714-1800

 91-044-6714-1804

## USA (KLA)

 29930 Hudson Drive  
Novi, MI 48377

 1-248-668-4300

The logo for HI Klemove is centered in the upper half of the image. It features the letters 'HI' in a bold, white, sans-serif font. A small blue square is positioned at the bottom right corner of the 'I'. To the right of 'HI', the word 'Klemove' is written in a larger, white, sans-serif font. The background is a dark, starry night sky with a faint Milky Way galaxy visible. In the lower half, there are light trails from a highway at night, with red trails on the left and white/yellow trails on the right. Two thin, vertical blue lines are positioned on either side of the logo, and a small blue vertical bar is on the right edge of the image.

**HI** Klemove