

Intro

AAM  
\* Advanced Air  
Mobility

Smart  
Logistic

Robotics

# Hyundai Motor Group

SDx  
\* Software Defined  
Everything

Hydrogen

PBV  
\* Purpose Built  
Vehicle

2024

Knowledge Exchange Days

Hyundai Motor Company / Kia  
Smart Factory **E-FOREST**  
SMARTER PLANT

Presenter : Hyunchul Cho

E-FOREST Strategy Group

Performance

Environment

**E-FOREST**

Philosophy & Core Value

Development direction

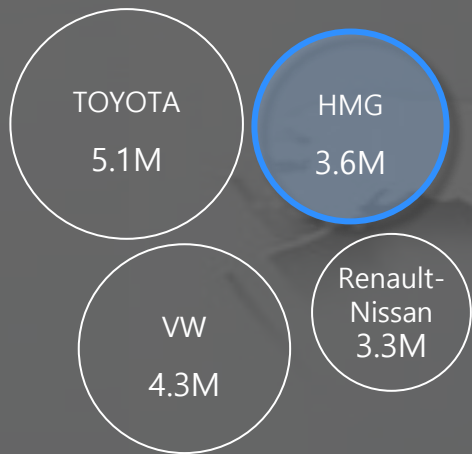
Use case

**HMGICS**

Expanded Deployment Strategy

# HMG Performance in 2024 (first half of year)

## Global sales Top 3



✓ On time - Supply of Best Seller though Production flexibility



✓ Optimizing Model mix considering customer needs



- TRIM A (Economy)
- TRIM B (Basic)
- TRIM C (Premium)



Best Seller

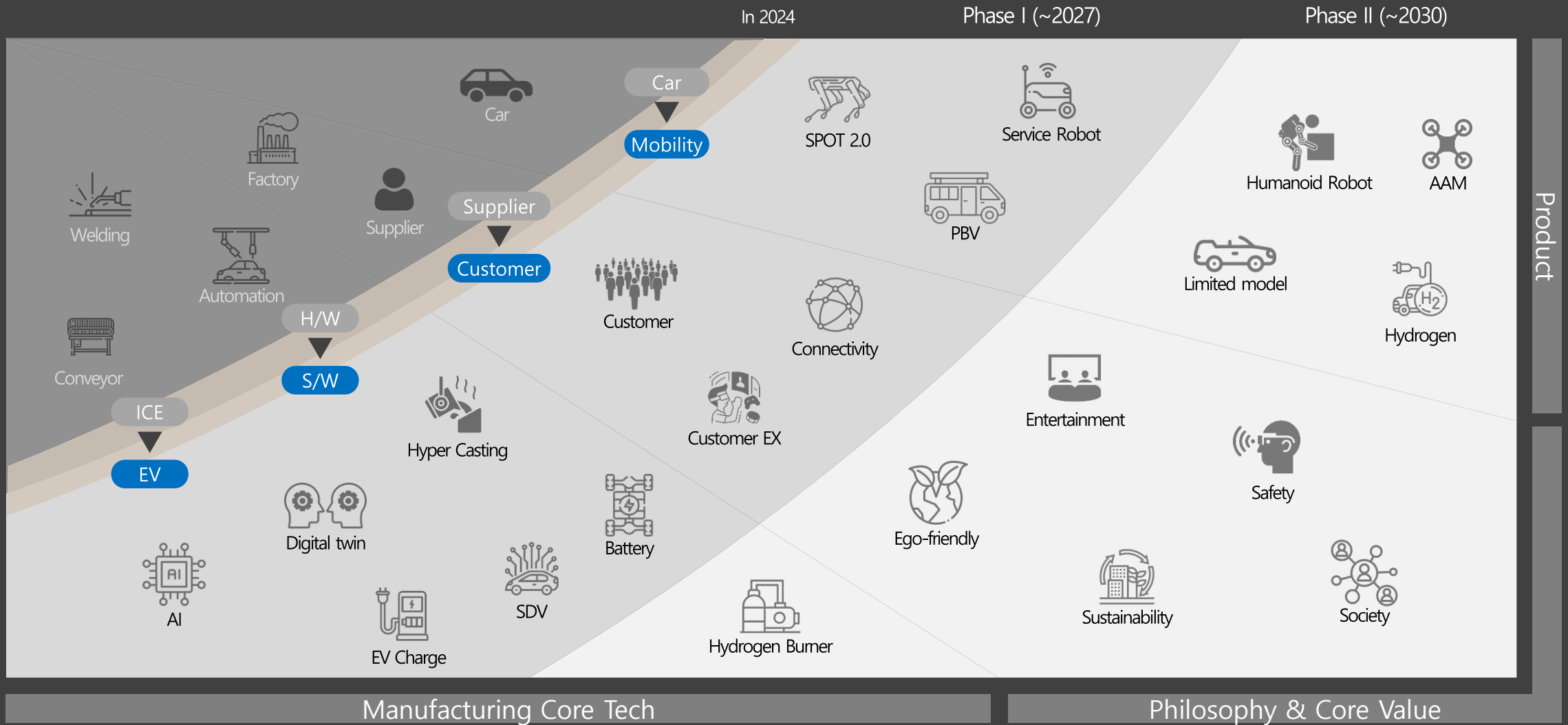
Expansion of local production

✓ Optimizing Model mix considering customer needs



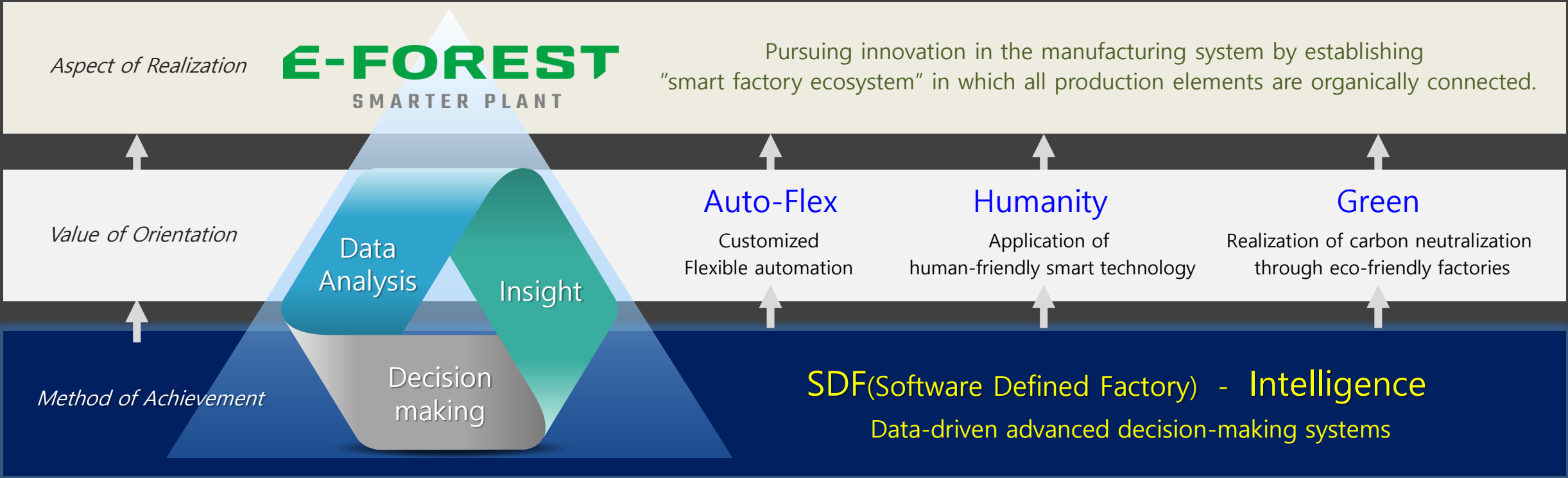
- BASIC
- Derived Model N
- Derived Model N-Line

# Environment



# E-FOREST Value

# Philosophy & Core





## Customized Mobility Manufacturing Platform based on E-FOREST Core-values

### Auto-Flex

- \* Optimal solution / Adv. system for cell production
- \* BBP (Block Based Process)

'25	Mixed production system for various models (Advanced cell work support system and algorithm)
'30	Flexible multi-model mobility production (Future mobility / robot / UAM, and etc)

### Humanity

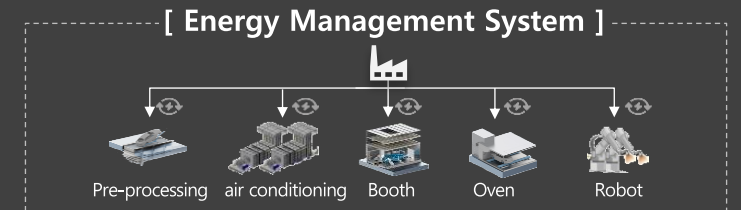
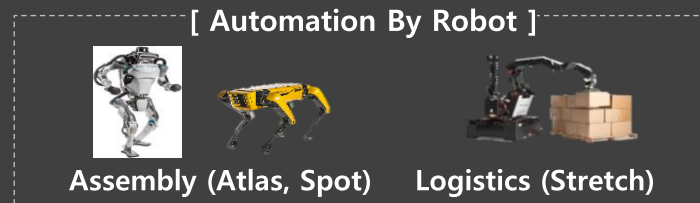
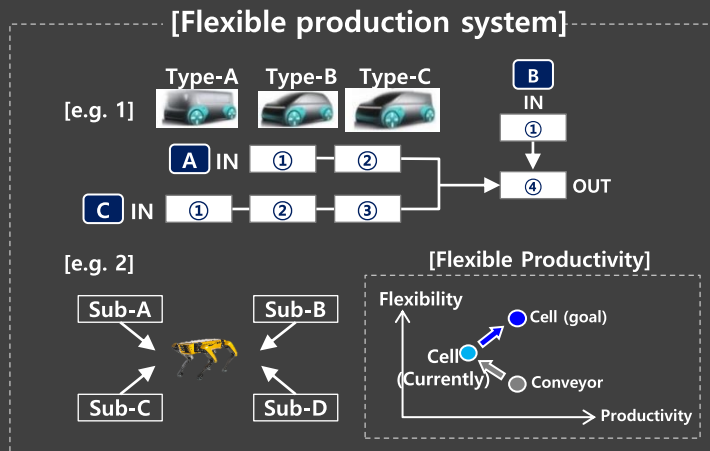
- \* Human-friendly worker convenience technology

'25	Development of Ergonomics Smart Technology
'30	Application of cooperative humanoid robot

### Green

- \* Improve global environment through technology

'25	Expand carbon neutral technology (Smart Grid, Intelligent carbon emission management, etc)
'30	Net-Zero Factory



Automation of Assembly (Automate assembly work by Using robots, vision, AI technology)

### Automate wheel alignment adjustment

- Using co-robots/AI to simulate worker behavior
- Replacement of workers with precise adjustment (4 Person)



### Automate headlining assembly

- Automate vehicle upper headlining assembly using robots and vision
- Simulating the operator's pressing behavior and respond to multiple models



Automation of Inspection (Automate inspection tasks by Using vision, AI, SPOT, etc)

### Automate appearance defect inspection in painting

- Determinate defects (dust/oil) through vision inspection
- Automatically correct defective parts by sanding automation



### Automate car body part gap inspection

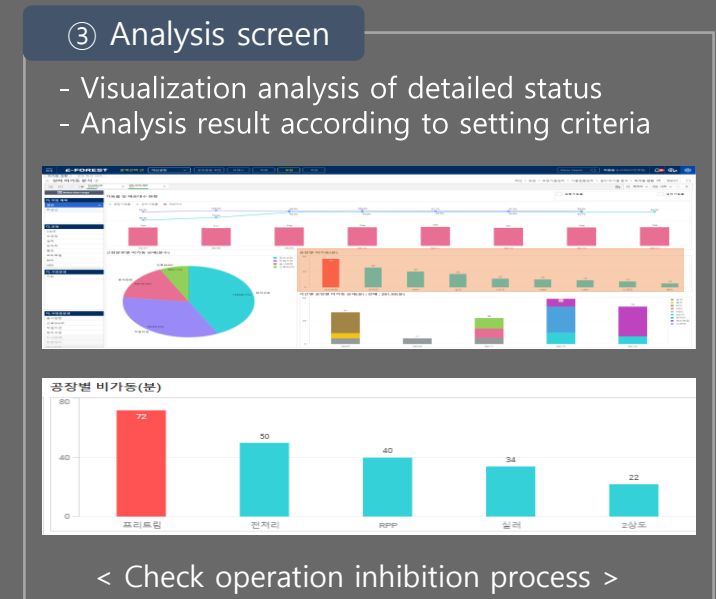
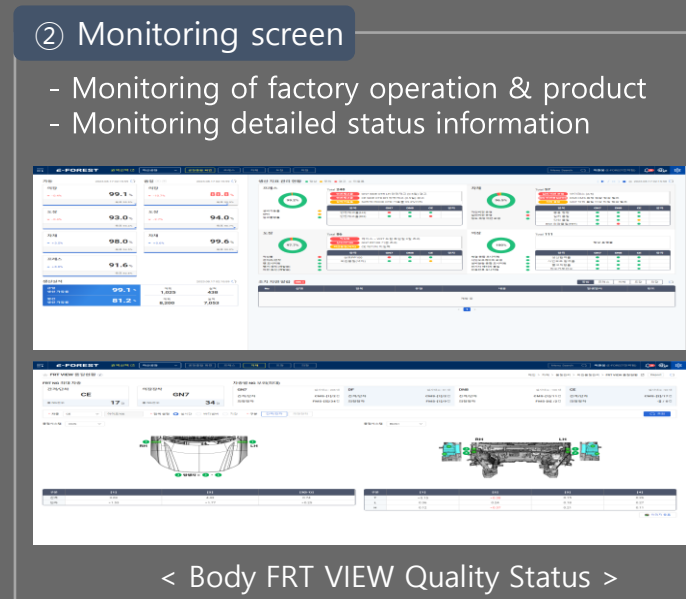
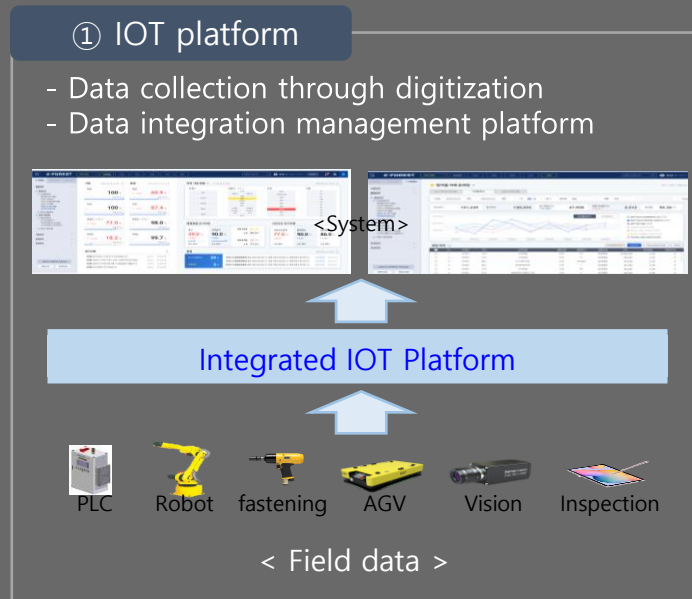
- Self-calibrating parts by analyzing algorithms based on data
- Prevention of defects through real-time full inspection and self-correction



## Factory - BI (Visualize manufacturing data in dashboard)

- Share information in real time → Manage unmanageable areas
- Development 125 monitoring system : Operation (58), Quality (49), Maintenance (18)

### Factory-BI Components



# HMGICS (HMG Innovation Center in Singapore)

The first open innovation lab in the world to revolutionize the total value chain  
(R&D-Manufacturing-Business)



- Location : Jurong Innovation District
- Factory Size : Site area (43,977m<sup>2</sup>)

Building area (91,680m<sup>2</sup>)

2 basement floors / 7

ground floors



# Key Achievements of HMGICS Phase-1 Development

Real-time synchronization of **Production Status** using **Virtual Factory** and **Data Connectivity** based on Innovative Manufacturing Platform

## Advanced Automation

Logistics : 7 → 65%, Assembly : 14 → 46%

Automated Warehouse



Mobile Robots



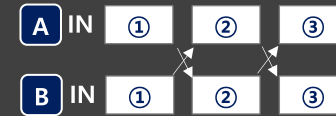
High-difficulty  
Assembly automation



## Flexible Production System

Cell-based flexible production (multi-variety mixed production)

Parallel flexible Cell



## Intelligent IT System

76 number of Manufacturing Intelligent IT System

MES Scada



OEE Dashboard



Wearable device (XR)



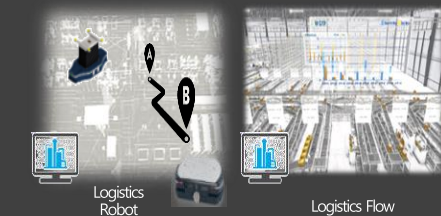
## Meta Factory (Digital Twin)

Virtual-based Monitoring and Simulation Optimization

Monitoring w / Data Synchro.



Plant Simulation (Logistics + Production)



# Expanded Deployment Strategy \_ Automotive



 **HMGICS**  
[Test Bed]



 **\*HMGMA**  
[Mother Factory]



 **GP**  
[Genesis Innovation Factory]



23Y


24Y

25Y

26Y

29Y~



 **Gwang myeong \*EVO**  
[HMG First EV Factory]



 **Hwasung EVO**  
[HMG First PBV Factory]



**H/K Global Factory**  
Remodeling



**Completely Autonomous  
Factory In 2030**

**"Called Dark Factory 247"**

# Expanded Deployment Strategy \_ New Business

25Y~



PBV

28Y~



Robotics

28Y~



AAM

30Y~



Hydrogen



**Smart Mobility Solution Provider**

# Thank you