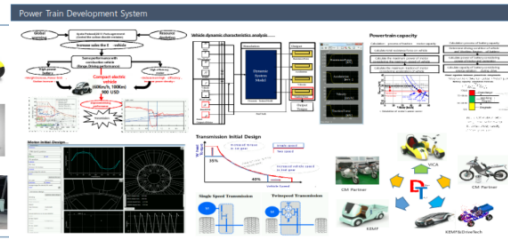
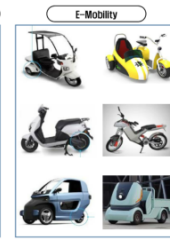
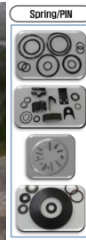
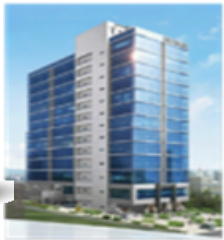


The Leader of Green-Energy Vehicle Components

R&D company providing high efficiency, standardization, and advancement of drive system

A venture company that aims to create an eco-friendly automobile culture where life is breathing healthily, contributes to industrialization of environment-friendly energy by communicating with humanity through technology

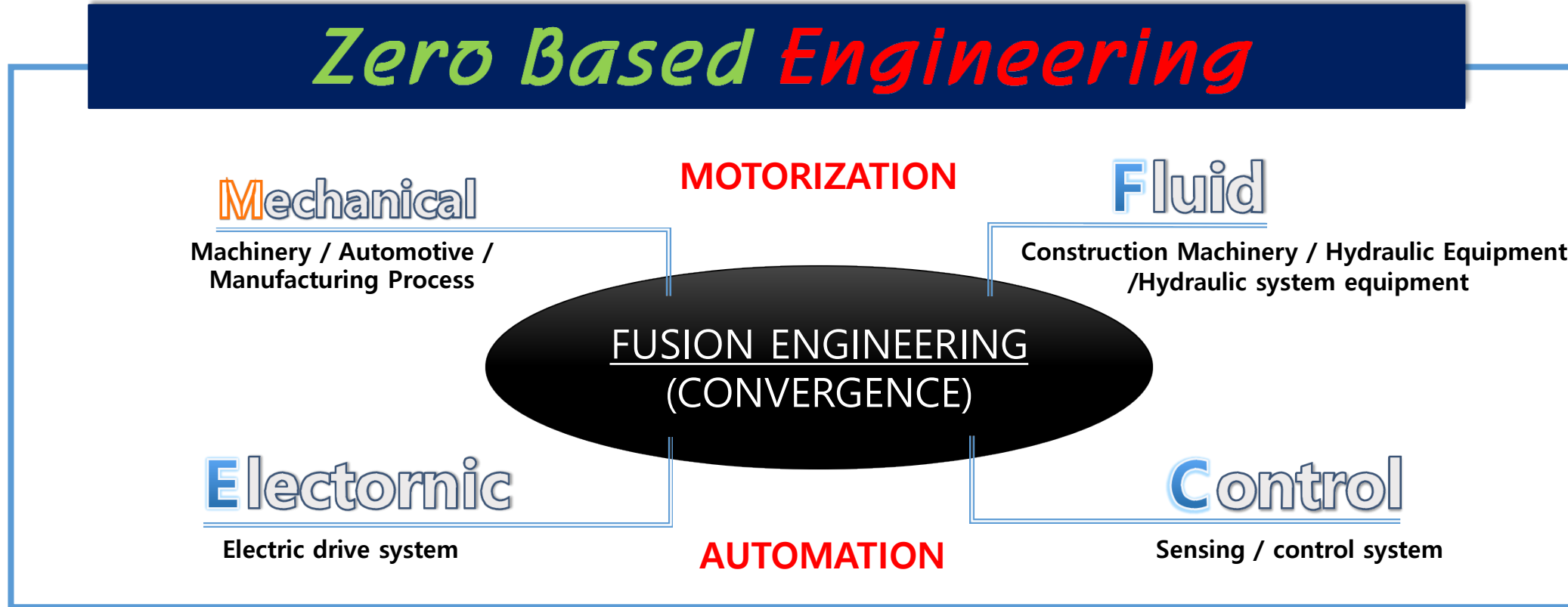
DRIVE TECH





"All Development Service for your needs and environment of EV "

Zero Based Engineering



Design / manufacture / sales of mechanical / electrical drive systems + technical / management engineering

1. What is DRIVETECH Co., LTD?

2. PROPOSAL OF EV PROJECT

Establishment Propasal of EV Production Base in Myanmar

3. TRANSFER TECHNOLOGY OF EV DEVELOPMENT

Design System and Development for Electric Vehicle

4. FULL PACKAGE SERVICE FOR EV INFRA.

Co-Operation Solution of EV Conversion



1. What is DRIVETECH Co., LTD?

WWW.DRIVETECH.KR



The Leader of Green-Energy Vehicle Components

R&D Development that provides high efficiency, standardization and advancement of drive system



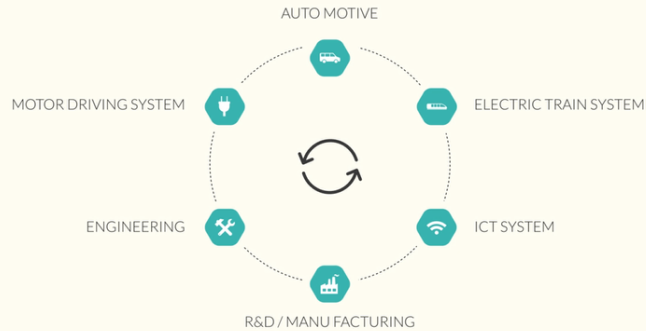
THE LEADER OF GREEN ENERGY VEHICLE COMPONENT

DRIVETECH

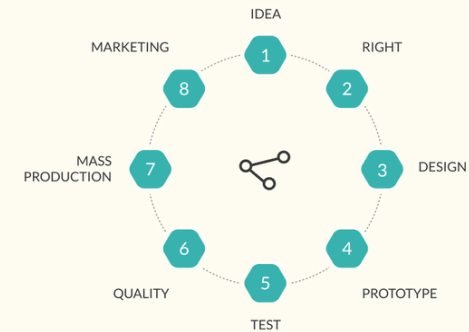
is a vision of

THE LEADER OF GREEN ENERGY VEHICLE COMPONENTS. COMPOSED OF EXPERTS IN THE AUTOMOTIVE FIELD. IT IS AN R & D MANUFACTURING COMPANY THAT PROVIDES HIGH EFFICIENCY, STANDARDIZATION, AND ADVANCED TECHNOLOGY OF ELECTRIC VEHICLE DRIVE SYSTEM.

LEADER OF POWERTRAIN SYSTEM FOR GREEN ENERGY

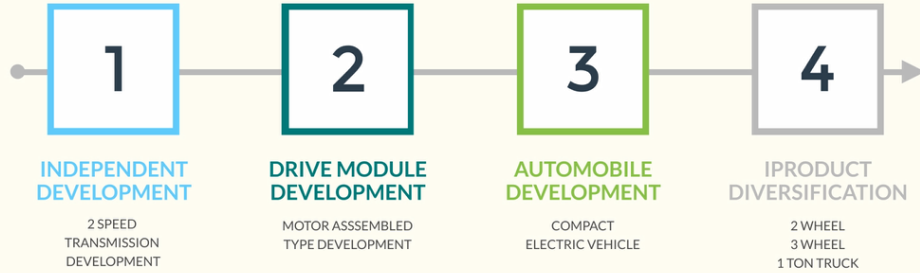


“MANUFACTURING AND TECHNICAL SUPPORT FOR YOUR NEEDS AND ENVIRONMENT”

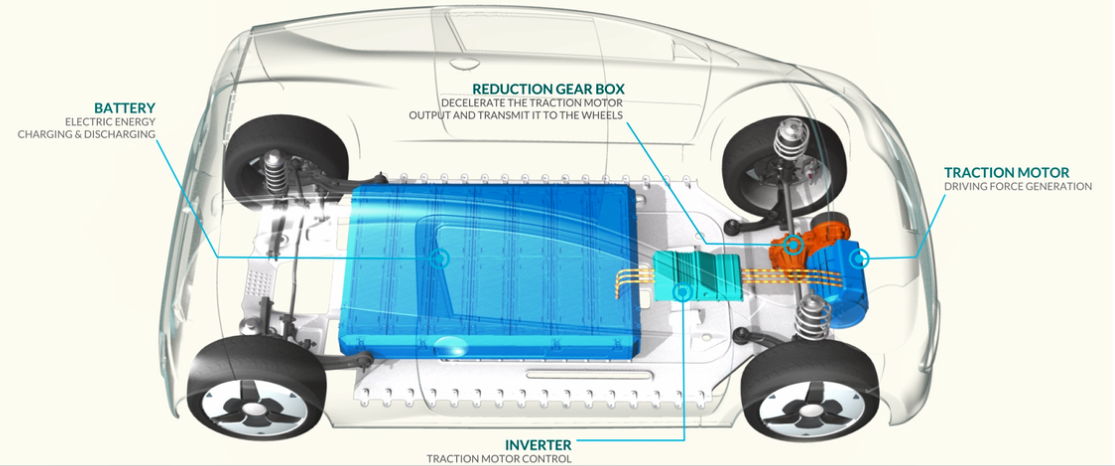




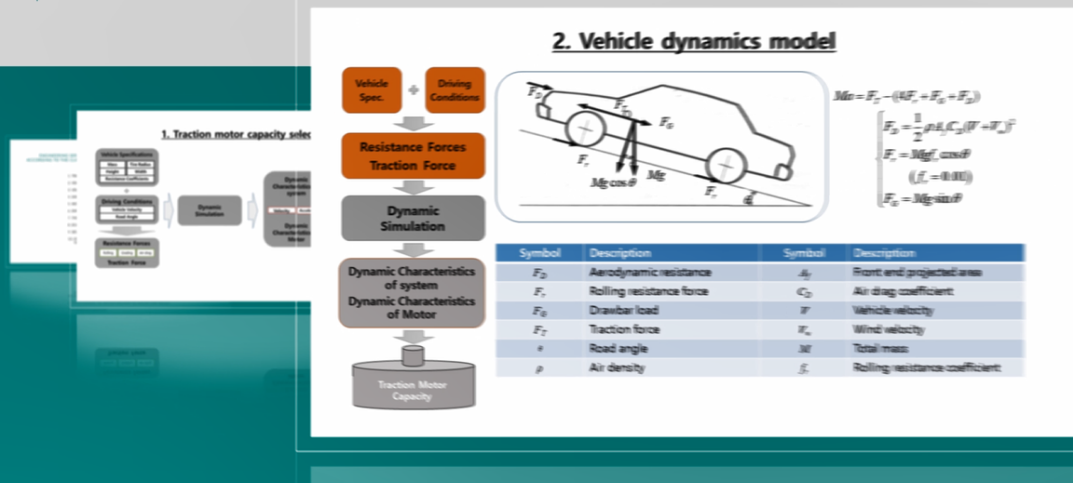
KEY INDUSTRIES ACCELERATION, PRODUCT SERVICE AND NEW BUSINESS CREATE THROUGH CORE TECHNOLOGY DEVELOPMENT OF ELECTRIC TRANSMISSION SYSTEM



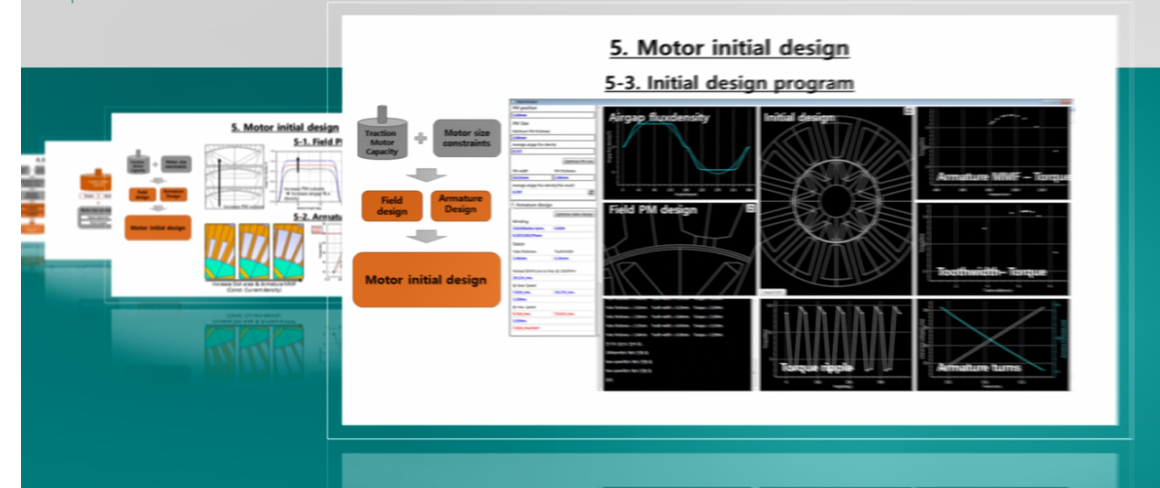
EV DEVELOPMENT ENGINEERING SYSTEM



EV/HEV-DEVELOPMENT ENGINEERING SYSTEM

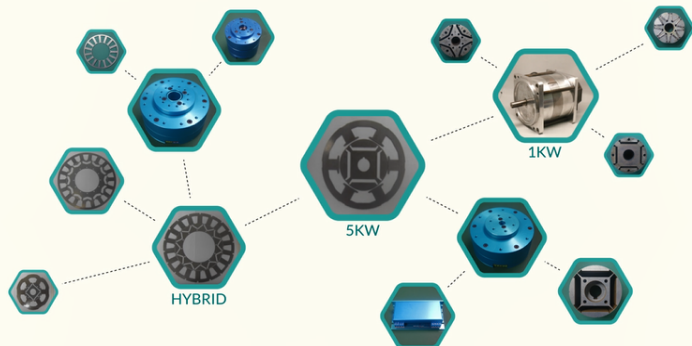


EV/HEV-DEVELOPMENT ENGINEERING SYSTEM





MOTOR DESIGN ENGINEERING



PRODUCTION AND SUPPLY SERVICE OF MOTORS TO BE MOUNTED ON ALL KINDS OF ECO FRIENDLY VEHICLES AND PRODUCTION SERVICE OF MOTOR CORES OPTIMIZING THE CHARACTERISTICS OF THE MAGNETS WHICH DECIDE THE PRICE AND THE PERFORMANCE OF THE DRIVE MOTORS.

IN WHEEL MOTOR

IN WHEEL TRANSMISSION MODULE

SPECIFICATION	
DRIVING MOTOR RATED OUTPUT	1KW
LEAD ACID BATTERY	1.4KWH
MAX SPEED	60KM/H
CLIMBING ABILITY	35%
MILEAGE PER BATTERY CHARGE	45KM



BLDC MOTOR

BRUSHLESS DIRECT CURRENT



2KW OR THE LOWER GRADE BLCD (BRUSHLESS DIRECT CURRENT) MOTORS, FOR APPLICATIONS TO SMALL SIZE ELECTRIC PRODUCTS, INDUSTRIAL AUTOMATION SYSTEM, POWER DRIVE SYSTEM AND SMALL SIZE ELECTRIC VEHICLES. OPTIMUM OPERATION IS REALIZED BY REAL TIME MONITORING AND CONTROL OF THE DRIVE AND THE ROTATION POWER

MAGNETIC REDUCTION GEAR

DIFFERENTIATION FROM GEAR REDUCTION METHOD

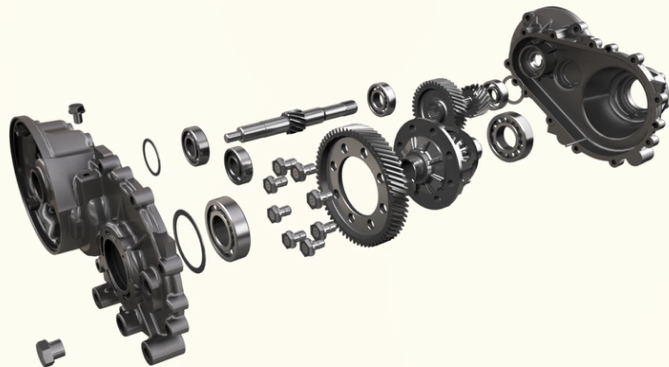


NOISELESS
CONSTANT HIGH EFFICIENCY
NON-LUBRICATING OIL
REDUCED MAINTENANCE COSTS
OVERLOAD SAFETY DEVICE
INFINITE REDUCTION RATIO
CAN BE CONNECTED TO ANY KIND OF MOTOR
CAN BE TRANSFORMED INTO VARIOUS CONNECTION STRUCTURES



REDUCTION GEAR BOX

DTA-S060

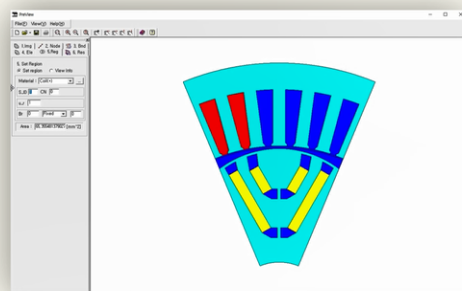


OPTIMIZED MODEL FOR SMALL ELECTRIC VEHICLES OF 60NM GRADE, WHICH INCREASES THE VEHICLE'S DRIVING POWER ESPECIALLY BY DELIVERING THE OPTIMUM ROTATION POWER TO BOTH OF THE WHEELS DEPENDING ON THE ROAD CONDITIONS, IN COMPARATIVELY SMALLER AND LIGHTER WEIGHT THAN THOSE OF

MOTOR DESIGN SOFTWARE

SELF DEVELOPED SOFTWARE FOR DESIGNING OPTIMUM MOTORS, WITH TECHNICAL SUPPORT SERVICE

E.M.F IS AN ABBREVIATION OF ELECTRO-MAGNETIC FIELD. IT IS A SPECIALIZED ANALYSIS PROGRAM THAT MAKES IT EASY TO USE FOR NUMERICAL ANALYSIS OF ELECTROMAGNETIC FIELD AND HEAT.



EASY TO OPERATE PRE PROCESSOR

APPLICATIONS OF THE E.M.F

- ELECTROSTATIC 2D AND 3D AXIS PROBLEMS
- TIME-HARMONICS 2D AND 3D AXIS PROBLEMS
- MAGNETOSTATIC(VECTOR POTENTIAL) 2D AND 3D AXIS PROBLEMS
- MAGNETOSTATIC(SCALAR POTENTIAL) 2D AND 3D AXIS PROBLEMS
- TRANSIENT MAGNETIC PROBLEMS

2 SPEED TRANSMISSION

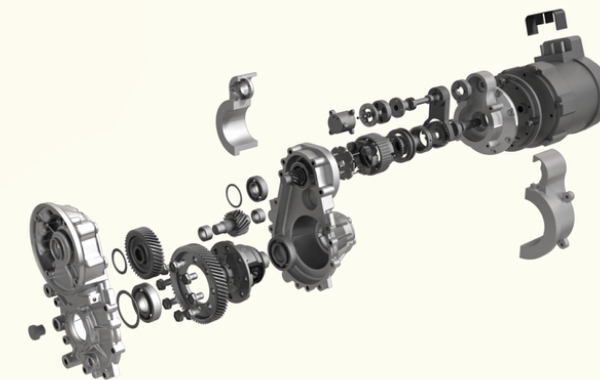
DTA-2S060



SHIFT ACTUATOR



SYNCHRONIZER RING



- 20% LIGHT WEIGHT & SMALLER VOLUME
- 20% MORE ECONOMICAL ELECTRIC CONSUMPTION
- SMALLER BATTERY & MOTOR CAPACITY
- MORE HIGH DRIVING PERFORMANCE

ELECTRIC VEHICLE (MASS PRODUCTION)

EV-MINI TRUCK



ITEM	SPECIFICATION
NUMBER OF SEAT	2/4 SEATS
LOADAGE	0.5 TON (1 TON)
VEHICLE SIZE	2,450X1,500X1,3500
DISTANCE	50KM (100KM)
MAX SPEED	50 KM/H (80 KM/H)
MOTOR	AC MOTOR (4.5KW, 7KW)
BATTERY	48V / 72V

STRONG POINT

GOOD FOR UNPAVED ROAD
THE BEST VEHICLE FOR AGRICULTURE





CERTIFICATION

Partnering Opportunity
Business Offer

South Korean manufacturer in auto parts industry is looking for European partners under joint venture agreement and manufacturing agreement.

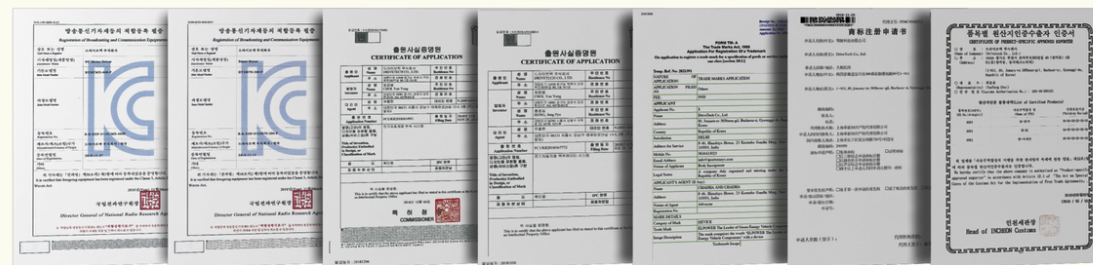
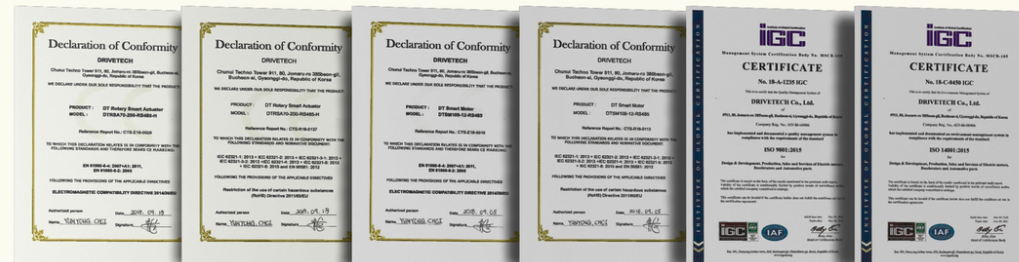
Summary

The company was established in 2010 specialized in manufacturing auto parts of electronic control as a subsidiary of LG Chemical. The company has been developing various products such as electric motor, power window motor, electric power lock, and automatic parking system. The company is looking for European partners under joint venture agreement and manufacturing agreement to expand its business in Europe.

Details

The South Korean company was established in 2010 specialized in manufacturing auto parts of electronic control as a subsidiary of LG Chemical. The company has been developing various products such as electric motor, power window motor, electric power lock, and automatic parking system. The company is looking for European partners under joint venture agreement and manufacturing agreement to expand its business in Europe.

EEN



2017 SEOUL MOTOR SHOW



2017 DAEGU EXPO



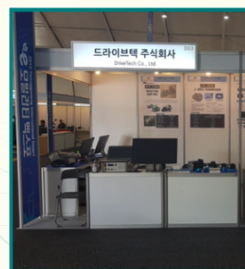
2017 M-TECH (OSAKA)



2017 KOAA SHOW



2017 KOREA MACHINE WORKS



2018 E MOBILITY EXPO



China



UAE



Indonesia



Russia



Netherlands



Malaysia



Germany



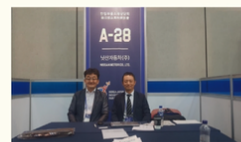
Algeria



USA



Mongolia



Japan

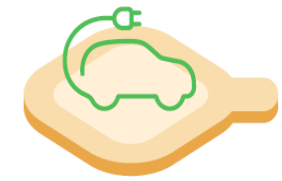
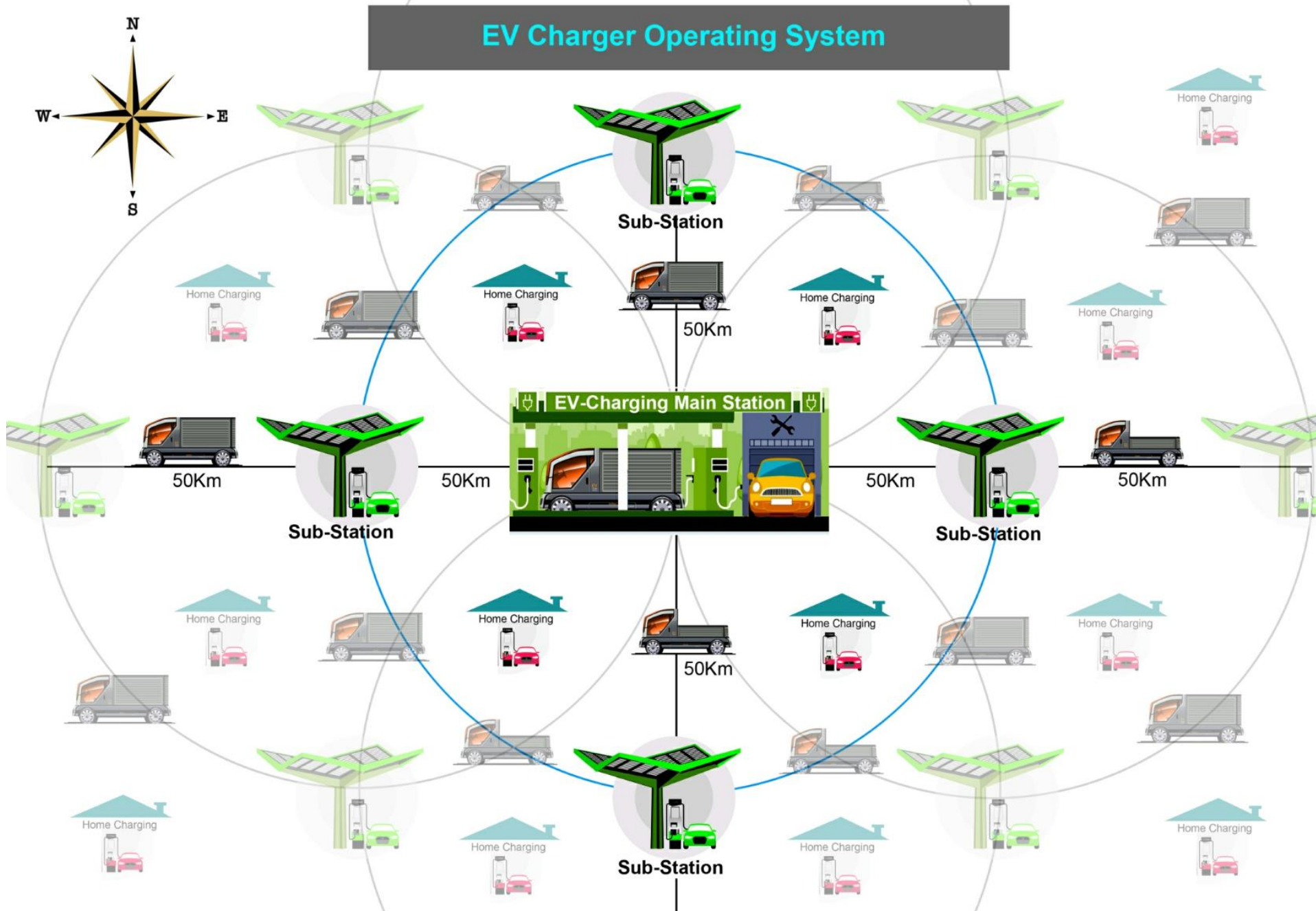


2. PROPOSAL OF EV PROJECT

Establishment Propasal of EV Production Base in Myanmar

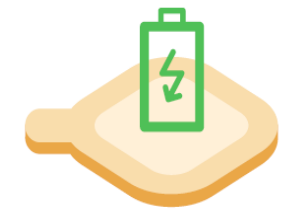
WWW.DRIVETECH.KR

EV Charger Operating System



Grid

110V~220V
Up to 3.3Kw



Battery Swap

Battery Swap
Charged Battery
Replacement



Stationary

220V~380V
Up to 7Kw



The Leader of Green-Energy Vehicle Components

R & D equipment that provides high efficiency, standardization, and advancement of drive system



Map of Myanmar with various regions highlighted in different colors and surrounded by text boxes containing Burmese text. The text boxes appear to be technical specifications or descriptions related to the regions or components.

PLAN of EV PROJECT



Establish a production base in MYANMAR in cooperation with Joint Venture Partner, and develop and expand market together, and then enter into the 3rd countries market.

1st Step	Assembly Production of Mini-truck as a Pilot Project - Key components is to be supplied from Korea, together with technologies.
2nd Step	Develop new EV to meet the market demand in MYANMAR - Establish an assembly system by module and transfer the technologies.
3rd Step	Establish a full production system and expand market in MYANMAR - Key components from Korea, others are to be localized.
4th Step	Enter into the 3rd countries market.

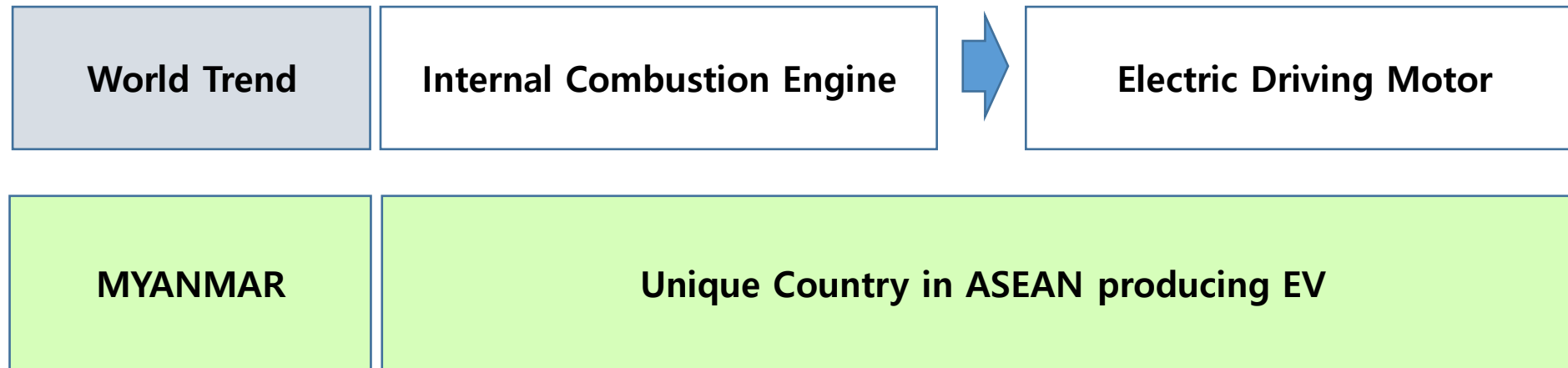
LONG TERM VISION –Manufacturing EV in MYANMAR



1. UNIQUE COUNTRY IN ASEAN

Myanmar will be an unique country which has its own brand of Green Car (EV) in ASEAN.

Due to the tightening the control on environment in world level, most car manufacturers in the world have been concentrating their efforts on producing and introducing Green Cars just like Electric Vehicles for world market from 2025.



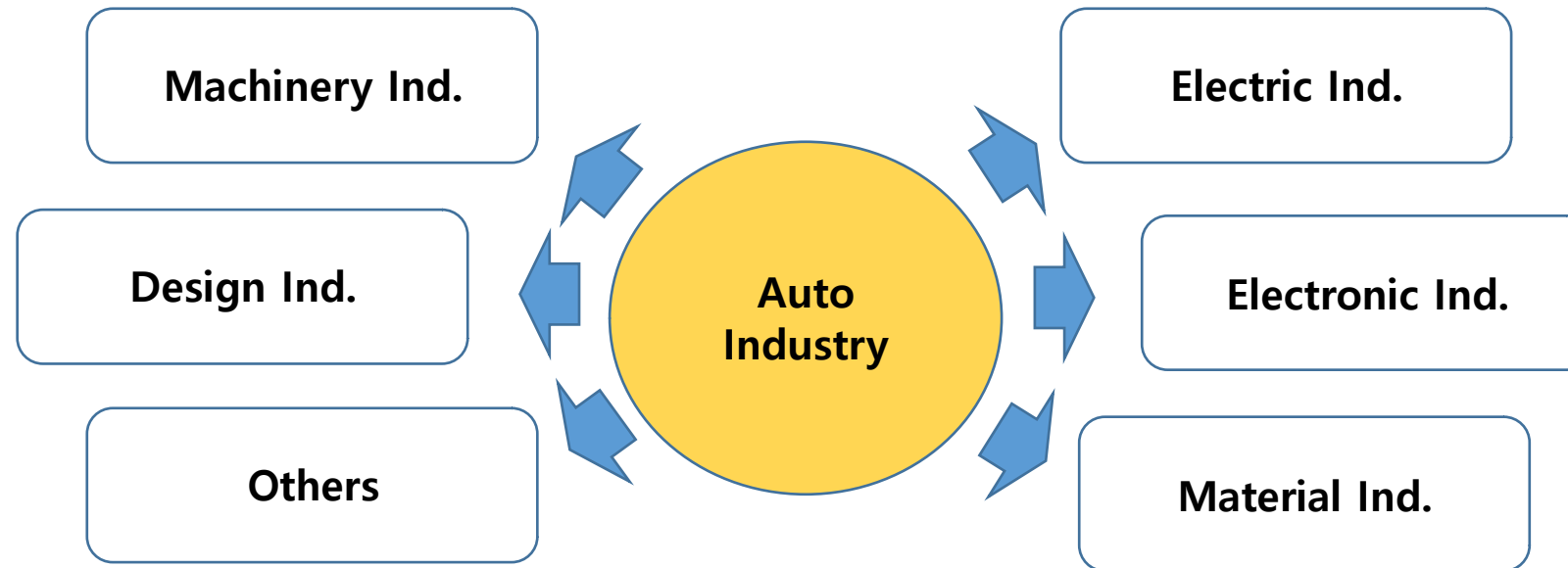
LONG TERM VISION –Manufacturing EV in MYANMAR



2. HIGH VALUE-ADDED MANUFACTURING INDUSTRY

- Establishment of production base of High Value-Added Manufacturing Industry.

Car manufacturing will have a positive effects on comprehensive and far-reaching industries, just like Machinery, Electric, Electronic, Materials, and Design and so on.



Comprehensive and Far-reaching effect on industries

LONG TERM VISION –Manufacturing EV in MYANMAR



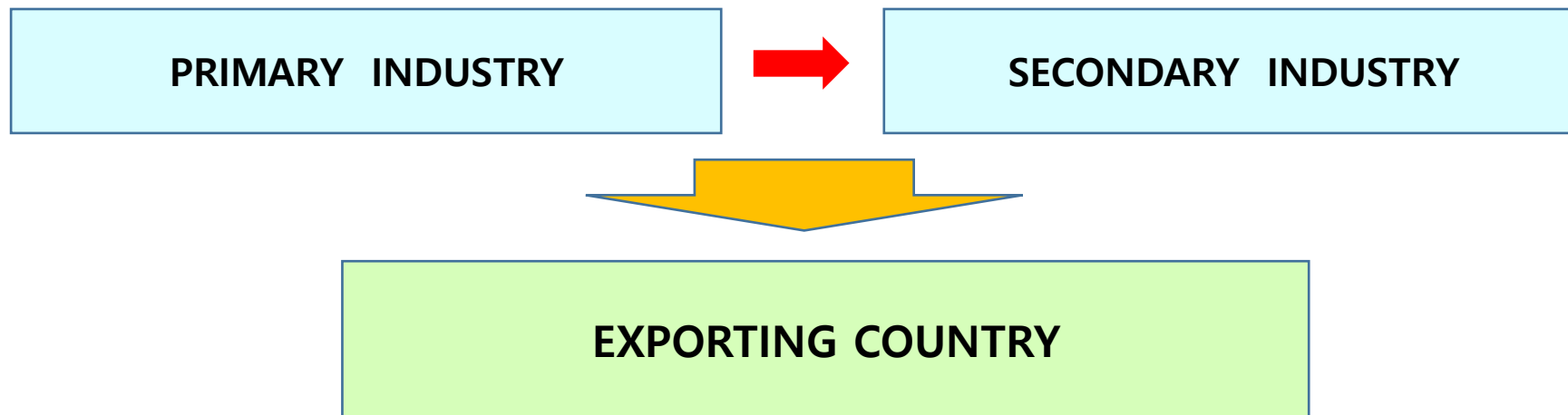
3. JOB CREATION

Auto Industry is a field which has the strongest potential for job creation.

Eventually, the industry will change the economic structure, creating prodigious numbers of job in related industries.

4. TRANSFORMATION TO EXPORTING COUNTRY

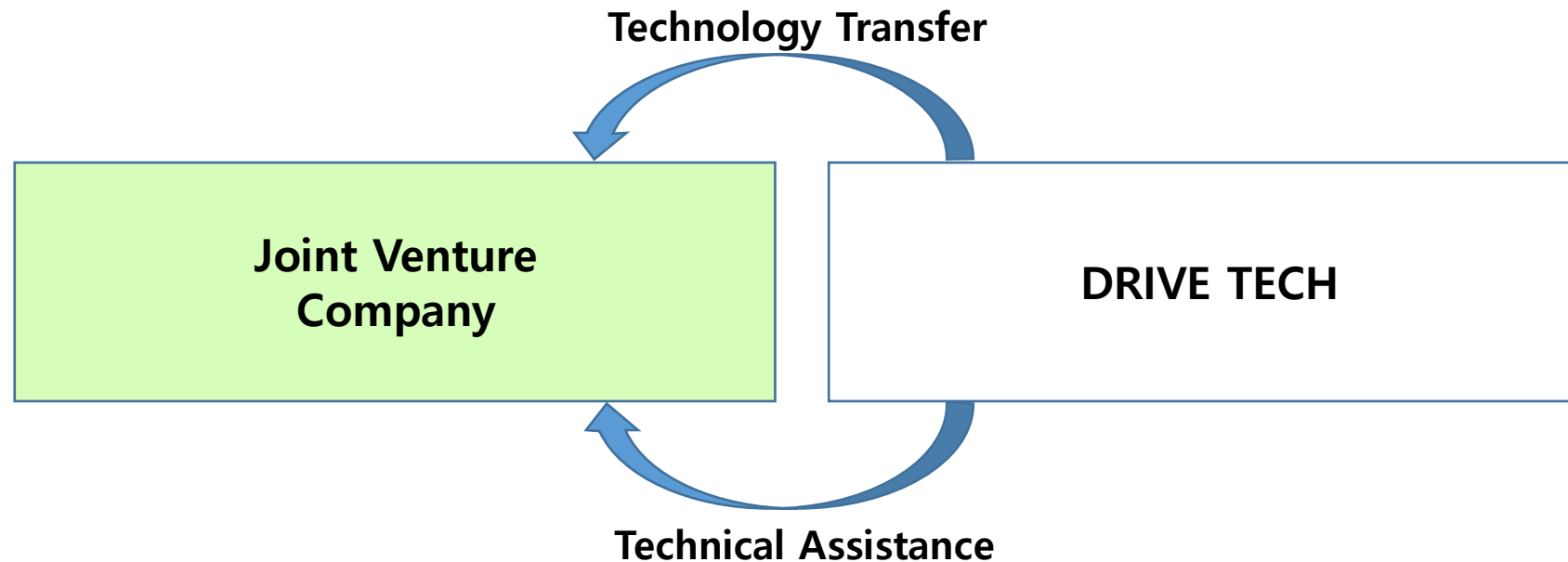
Taking advantages of Low Labor cost, Tax free, Geographical advantage to Europe, Middle East, India, Asean, Myanmar will be transformed to exporting country.



REQUIREMENT FOR SUCCESSFUL JOINT VENTURE

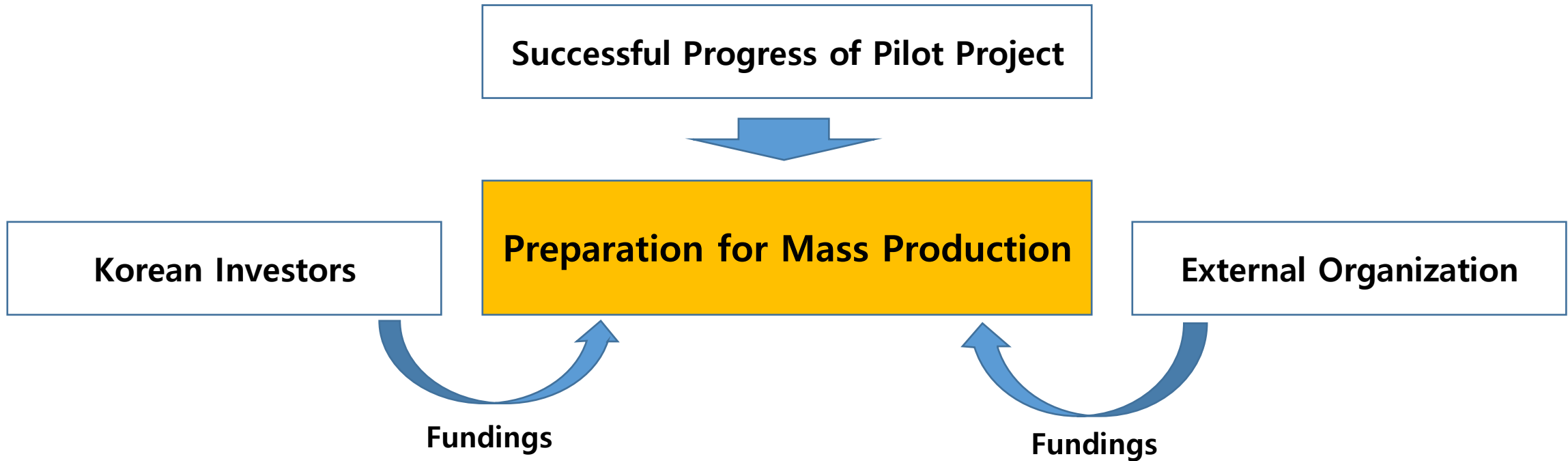


Success of Joint Venture of car manufacturing requires **Ongoing and Continued technology transfer** and **technological assistance**.



FUNDINGS, GRANTS, LOANS

With the positive assistance from Myanmar's government, when the Pilot Project is going well, fundings and investment from Korea for the establishment of mass production system will be possible after Pilot Project.





The Leader of Green-Energy Vehicle Components
R & D equipment that provides high efficiency, standardization, and advancement of drive system



SUGGESTION and REIVEW of PILOT PROJECT (1st Step)

In what modes will the partnership be worked ?



At the stage of Pilot Production (1st Step)

Myanmar Partner

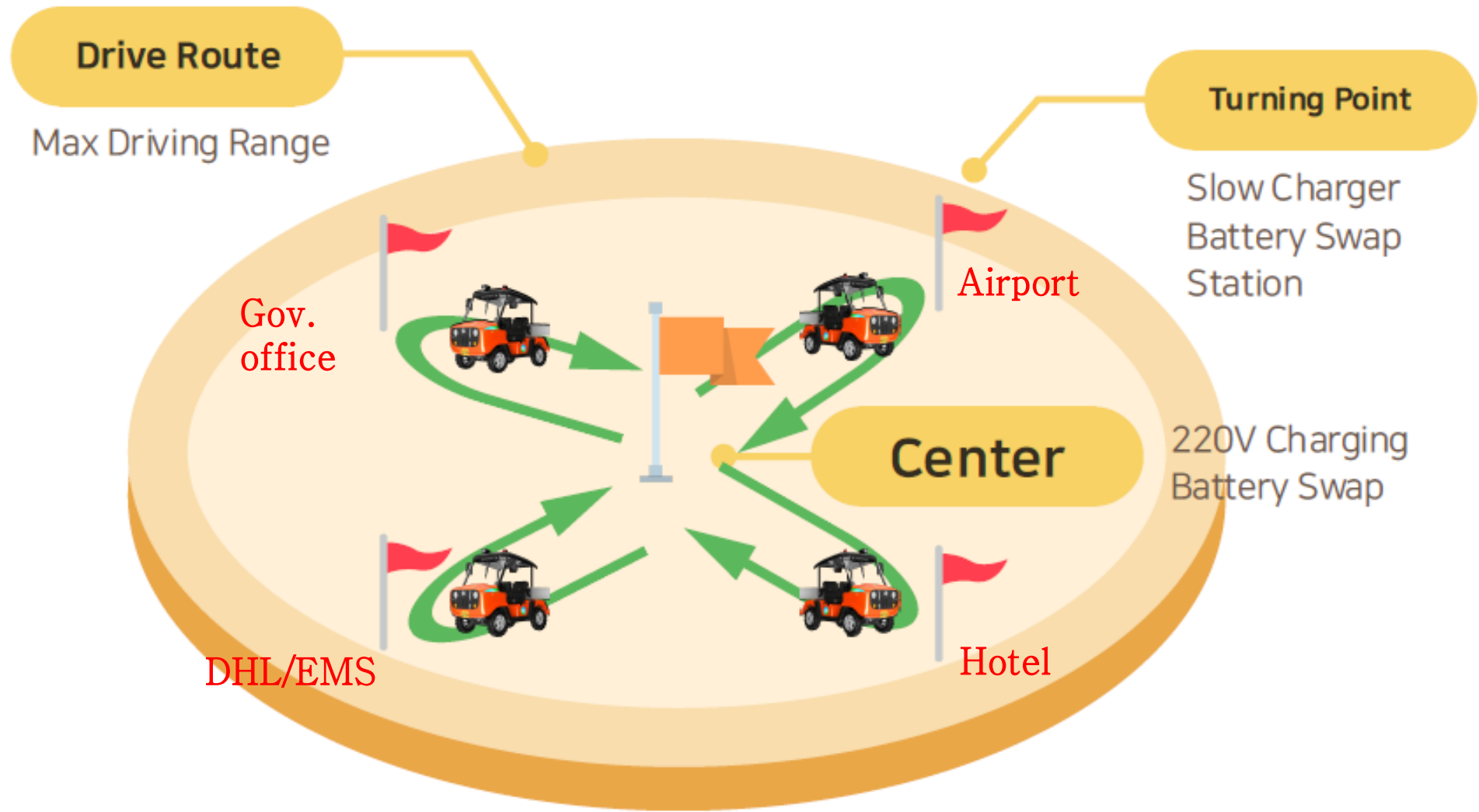
Invest in kind and working expenses

Drive Tech

Provide

- 1) Technologies,
- 2) Engineering experts,
- 3) all parts and components of vehicles to be assembled,
- 4) Education & Training, and Operating System

CONCEPT of PILOT PROJECT



Circulation route based on important facilities

Products of Pilot Production

EV- Mini Truck

[Basic Specification]


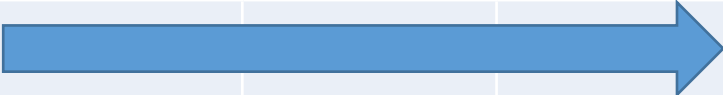
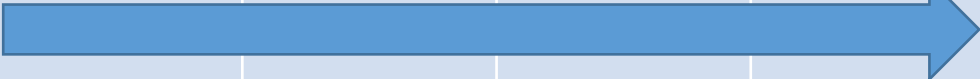

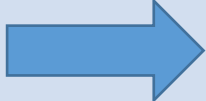






- Number of seat : 2/4 seats
- Loadage : 0.5 ton (1 ton)
- Vehicle Size : 2,450x1,500x1,3500
- Distance : 50km (100km)
- Max Speed : 50 km/h (80 km/h)
- Motor : AC Motor (4.5kW, 7kW)
- Battery : 48V / 72V

[Strong Point]

- Good for unpaved road
- The best vehicle for agriculture



PROJECT TIMELINE (1ST STEP)

ITEM	D	D+1M	D+2M	D+3M	D+4M	D+5M	D+6M	D+7M
MOU & Contract								
Factory Arrangement								
Preparation of Components, M/C, and Equipment								
Transportation								
Education & Training								
Assembly								
Testing								

Education & Training, Assembly, Test





DRIVETECH

(www.drivetech.kr)

3. TRANSFER TECHNOLOGY OF EV DEVELOPMENT

*Design System and Development
for Electric Vehicle*

1. Most of Thai companies **don't have tools** to understand their **designs results, performance** after put parts together.
 2. They **don't know** after the assembly how all parts will function with **each others well or not**.
 3. They will know after they completed put things together, their vehicles is **not run smooth**, that their **battery is too large**, or **components are not compatible with each other** that well as they thought.
 4. They **will lost** their **prototypes, money**, and have to try to **make a new one again to solve their previous problems**.
-
1. If there is **knowledge of part selections, tool for simulation**, that can show the end product performances, this will help companies understand and shorten their trials.

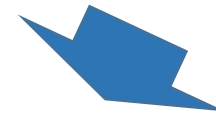
< System Integration >

1. Parts selection, Function compatibility
2. How to run engineer simulation, example
3. Testing and verification process



**You wanted to know
how to simulate a product
before assembling it.**

**=> It's not a simple thing.
In this short time ...**

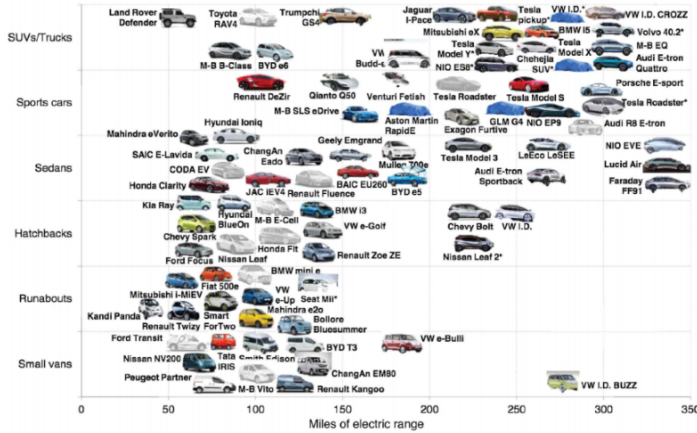


***However,
I will give you an explanation about
what you can do in the future
to make a good electric car.***

Design System and Development for Electric Vehicle

Selection of Vehicles

Models by style and range available through 2020



출처: Bloomberg

What electric car will you make?

- SIZE
- DESIGN
- SPEED
- USABILITY
-

Selection of Design/Size

Number of passengers, basic chassis, interior and exterior



http://dept.saekyung.ac.kr/dept111/index.php/mid-board_3hgo138document_srl=17350

Required Power-System of Vehicles

INPUT

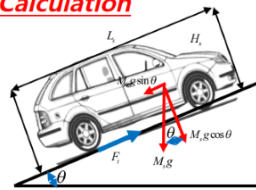
WEIGHT

SPEED

SIZE

Design Calculation

$M_v [kg] = 200 \text{ kg(car)} + 200 \text{ kg(3 man)}$
 $\theta [deg] = 16.7 \text{ deg (up a slope of angle 30\%)}$
 $C_r = 0.013$: rolling resistance coefficient
 $\rho_{air} [kg / m^3] = 1.18$
 $Vehicle \ width \ [m] = 1.2$
 $Vehicle \ height \ [m] = 1.4$
 $Vehicle \ length \ [m] = 2.3$
 $A_{front} [m^2] = 1.68$
 $C_d = 0.6$: Aerodynamic drag coefficient
 $V_{max} [m / h] = 30$
 $Tire \ radius \ [m] = 0.25$



$F_t = F_r + F_{air} + F_{hill}$: Force require to climbing
 $F_r = C_r \cdot M_v \cdot g \cdot \cos \theta$: Rolling resistance force
 $F_{air} = \rho_{air} \cdot A_{front} \cdot C_d \cdot V^2 \cdot 0.5$: Aerodynamic drag
 $F_{hill} = M_v \cdot g \cdot \sin \theta$: Hill climbing force
 $F_a = M_v \cdot a_x$: Force required to give acceleration

Required Power

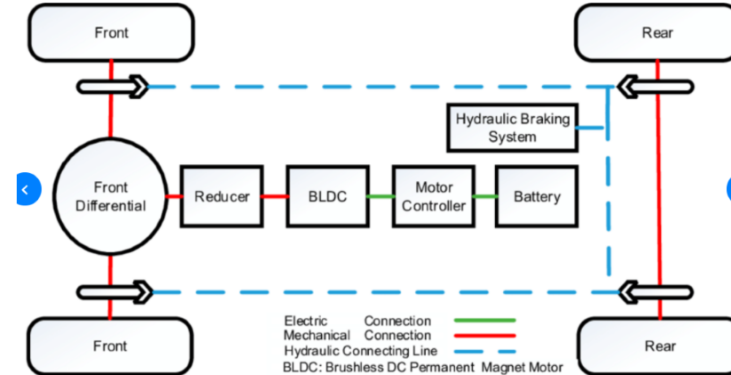
$$T_{shxft} = 600 Nm$$

$$P_{out} = 16 kW$$

Required Driving Power

Gear Ratio	1:1	2:1	3:1	4:1	5:1	6:1	7:1	8:1	9:1	10:1
Motor Torque[Nm]	600	300	200	150	120	100	85	75	66	60
Motor Speed[rpm]	254	510	764	1020	1270	1530	1780	2040	2300	2550

Lavout Design of Vehicles Components

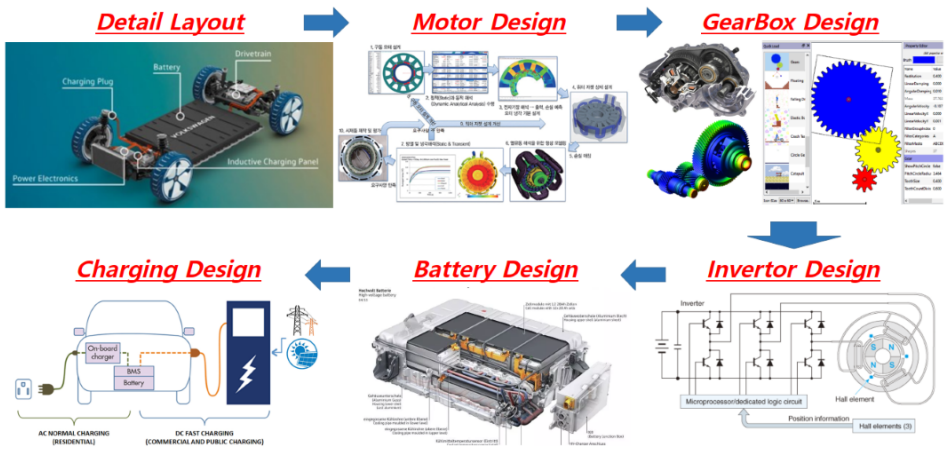


Topological structure of the battery electric vehicles (BEV) platform.

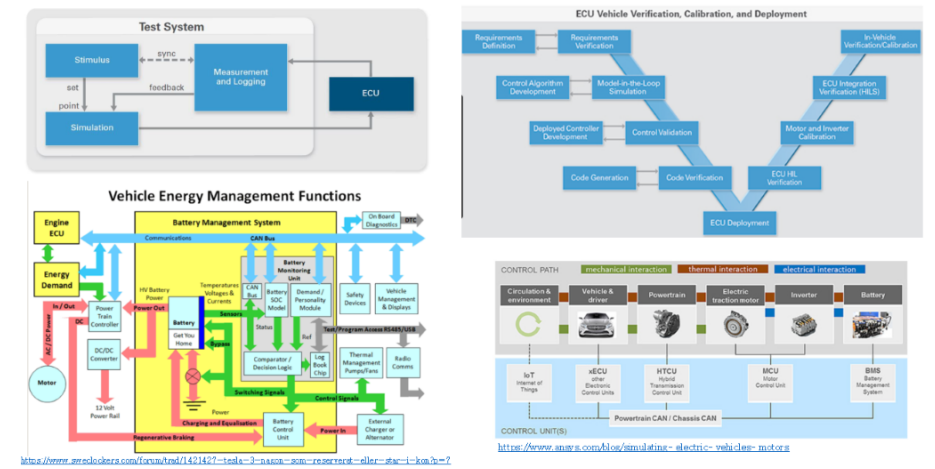
https://www.researchgate.net/figure/Topological-structure-of-the-battery-electric-vehicles-BEV-platform_fig3_321089883

Design System and Development for Electric Vehicle

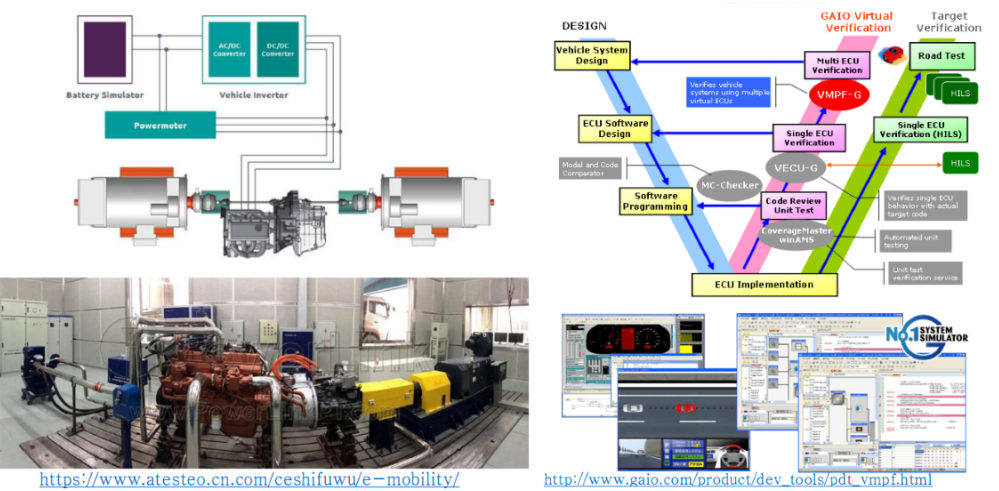
Detail Design of PowerTrain System



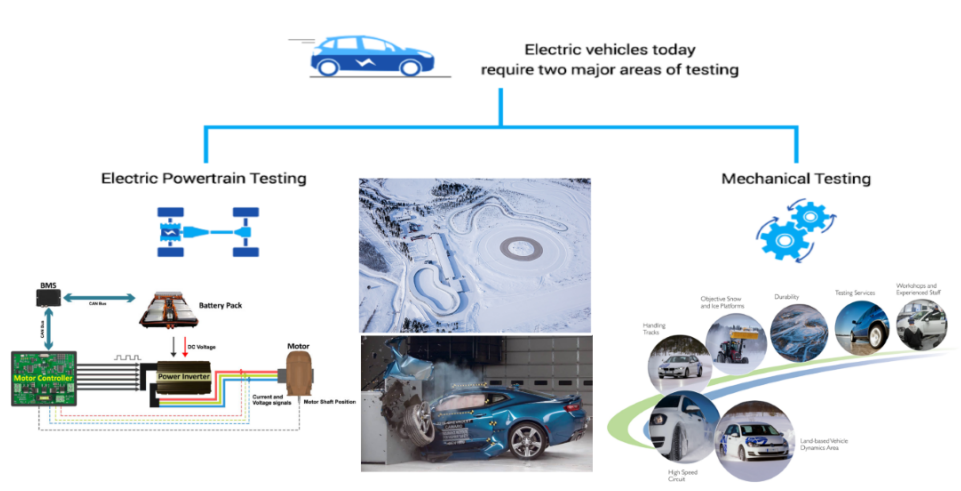
Virtual Simulation



Dynamo/Virtual Vehicle Test



Actual Vehicle Test



<https://www.atesteo.cn.com/ceshifuw/e-mobility/>

http://www.gaio.com/product/dev_tools/pdt_vmpf.html



DRIVETECH

(www.drivetech.kr)

4. FULL PACKAGE SERVICE FOR EV INFRA.

*Co-Operation Solution
of
EV Conversion*

CO-WORK STRATEGY

"Not just selling the product but work together"

Long-Term Business Partnership



« CO-BRAND PRODUCT »»

"Make the localized product together"

KOREA

Technology
Know-How
R/D
Training
Initial Assembly
Initial Production
Initial Quality
Upgrade



PARTNER

Regional Requirements
Human / Space Resources
Infra network
I/T Support
Installation/Construction
Assembly
Production
Quality
Customer Service
Repair and Maintenance

PILOT PROJECT

Feasible Pilot Project

Co-Work with realistic pilot project

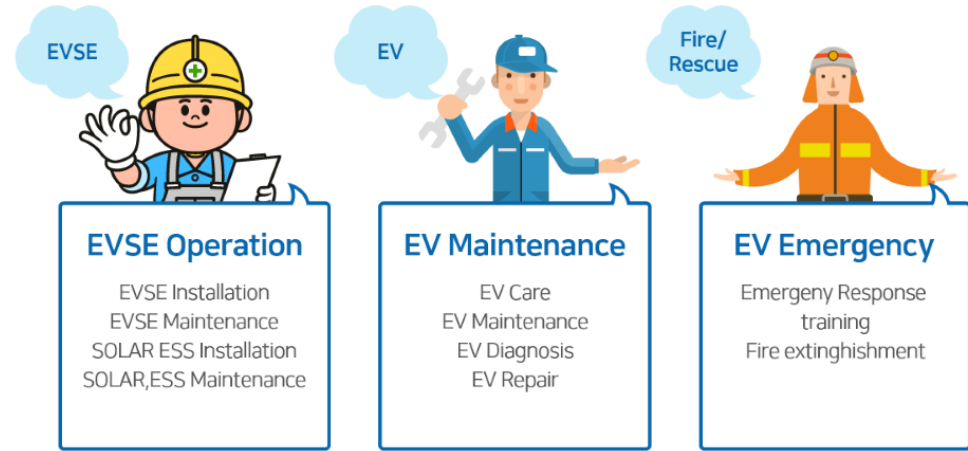


Training



Training

Based on German & USA standard
Certification Course / Non-Certification Course



Training

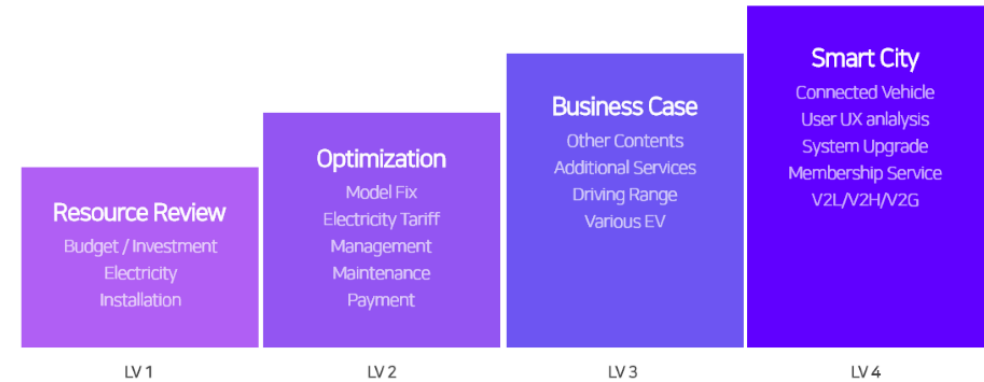
For engineer and Service Technician



EVSE Infra



EV Charging Infra

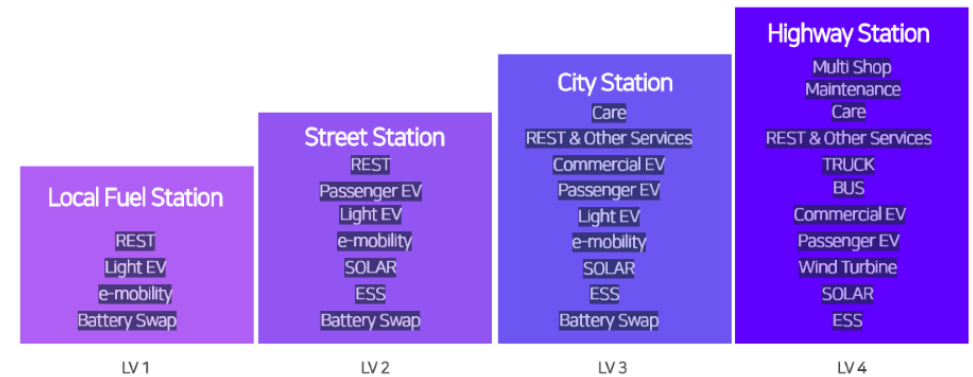


OPERATION PLATFORM

EV Charging Infra

MODULE BASE SYSTEM

Station Level



STANDARD OPERATION PLATFORM

Green Energy Business
[EV Charging Infrastructure]

Installed in Jaju Island, Jungbu-highway and Seoul (Green Car Sharing Project)

Product Function

Operation Management Program: Electricity statistics management with PC or Mobile by Daily, Monthly, Quarterly, Charge, Vehicle, Linked with Customer system

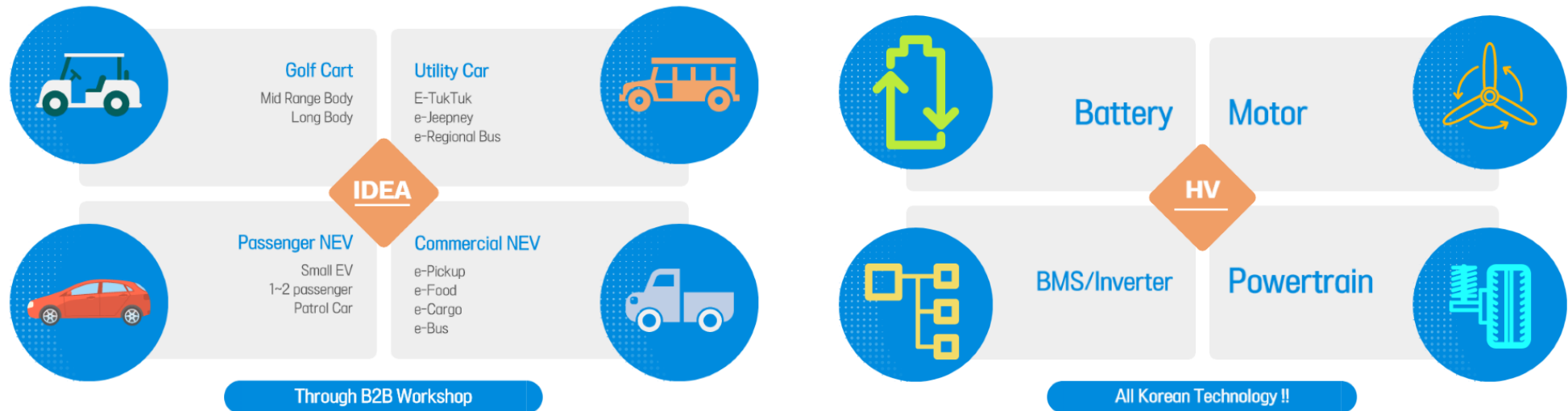
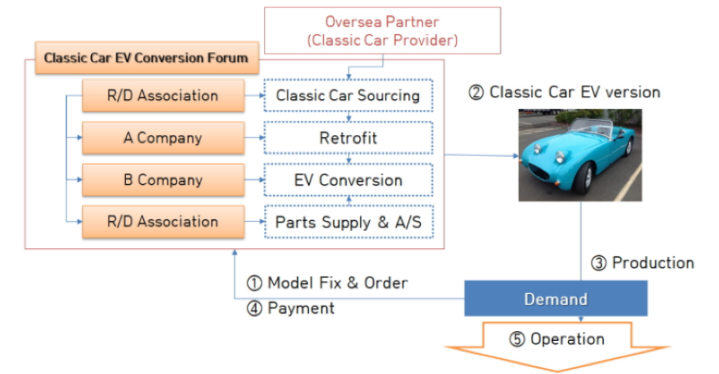
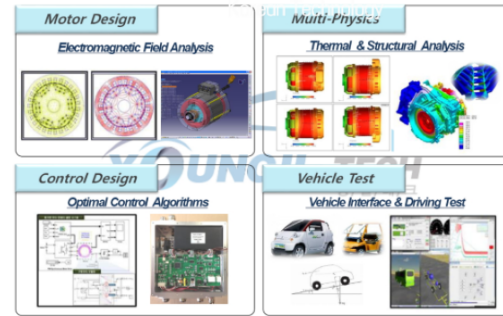
IPM EV Charging System Configuration

IPM EV Charging System Component Design

IPM EV Charging System Component Design

IPM EV Charging System Component Design

EV Conversion



EV Platform



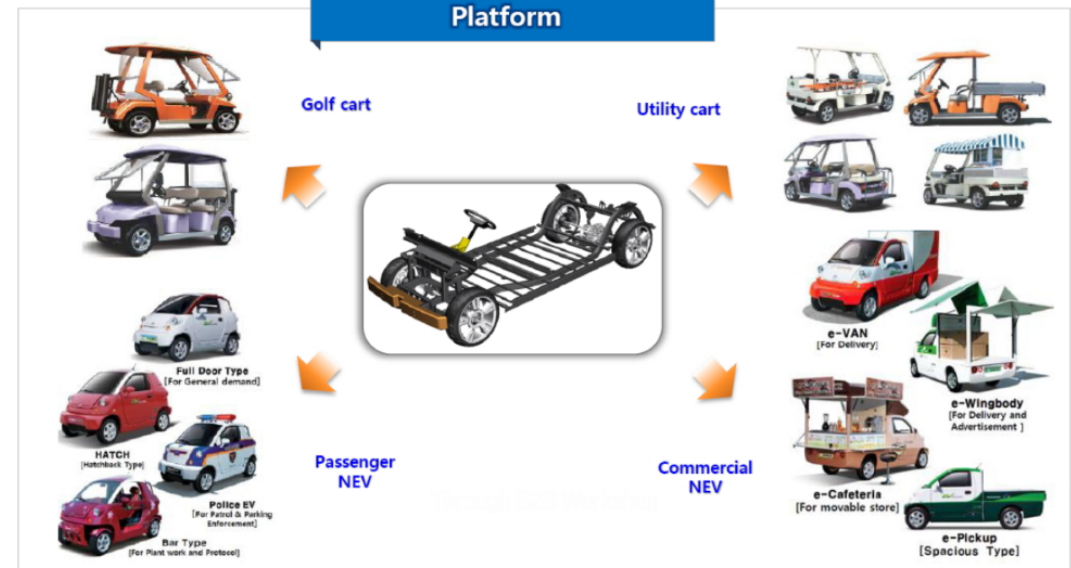
EV Platform

Considerations



Through B2B Workshop

Platform

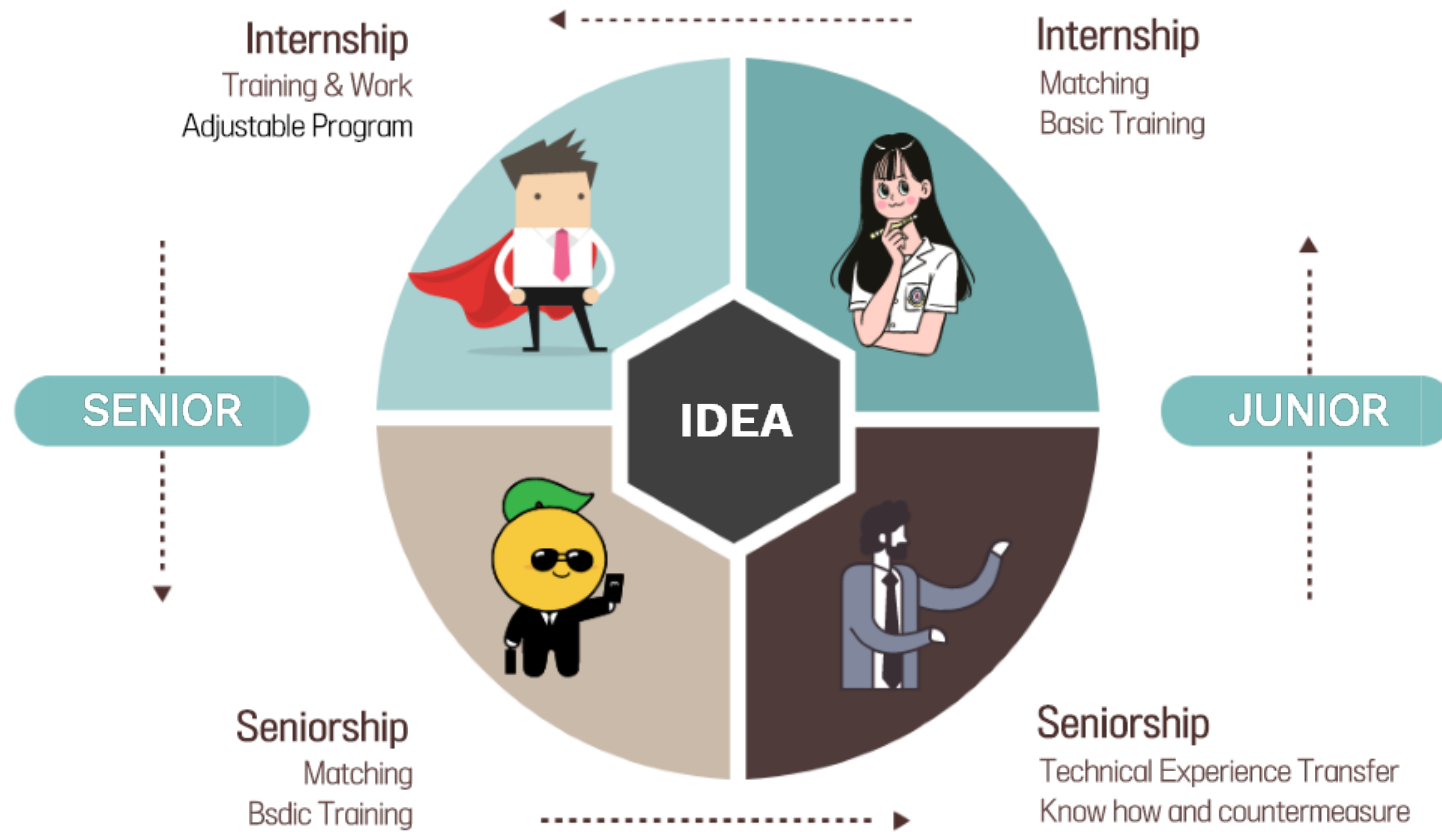


For the future

SYNERGY STRATEGY

KOREA

PARTNER





Thank you for your attention