

Blue Economy Jeonnam e-Mobility Industry Cluster Plan



전라남도
JeollaNamdo

Jeonnam e-Mobility Industry Cluster Plan



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Future Automobile e-Mobility Industry Trends

01

Future Automobile e-Mobility Industry Trends

Industrial Features

Definition Electric-powered transportation device designed for one or two persons



Micro EV



Agricultural EV



Electric Motorcycle



Electric Wheelchair



Electric Bicycle



Electric Scooter

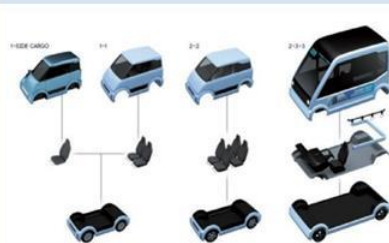
Clean Environment

Response to
Environmental Issues
such as Fine Dust Crisis



Small Batch Production

Flexible Industrial
Structure



New Lifestyle

Diversified
Transportation Services



4th Industrial Revolution

Convergence of Cutting
Edge Technologies such as
autonomous Driving, AI, IoT



Market Trends

Rapidly growing technologies to capture the global leadership in e-Mobility market

Global Market

- Market growth is driven by emission control, green vehicle policy and extended mileage technologies



US EV owner entitled to income tax exemption



China 300GWh EV battery production anticipated by 2020



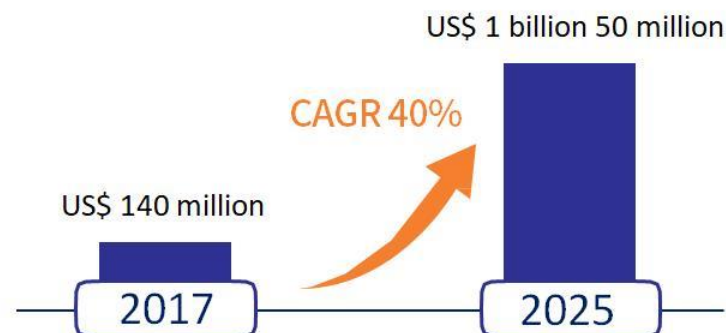
EU 190 million euros be invested in e-Mobility R&D



India India to become a 100% EV nation by 2030.

Korean Market

- Single-person and two-person households on the rise, growing green vehicles, and legislative changes



Micro automobile safety standards are legislated. (Aug. 2017)

Electric bicycles are allowed to run on bicycle-only-lanes. (Mar. 2018)

Shared electric scooter service is launched. (Oct. 2018)

「Data Source : KEMA, Korea Smart E-mobility Association」

Government Policy Trends

Future Automotive Industry is one of the 8 leading sectors under the National Innovative Growth Engine.

「Data Source : Innovative Growth Strategy Conference' (2.19.)」

Accelerating Industrial Ecosystem Transition

Green vehicle production share of 10% by 2022



Upgrading Core Technologies

US\$ 1.6 bil. investments for key components and parts R&D



Expanding Charging Infrastructure

10,000+ EV charging stations by 2022

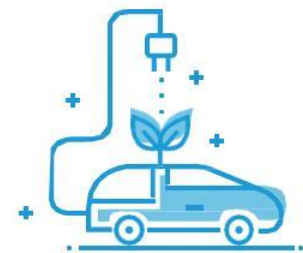


Business Support Package

Financial, and technological assistances

EV platform development for supporting overseas market launching





Jeonnam's Business Conditions and Potentials

The Most Advanced e-Mobility Industrial Infrastructure in Korea



e-Mobility development, evaluation, certification, and demonstration capabilities

e-Mobility Research Center



Open Research Center(Nov. 2017)

Joint R&D Center



Open (Aug. 2017) / 18 companies

Evaluation & Certification Instrument



High Performance Motor Testing System

Automotive Proving Ground



Under Construction
(Completed by Nov. 2019)

Crash Test Lab



Under Construction
(Completed by June 2020)



Electromagnetic Radiation Evaluation System

Integrated Research and Business Establishments



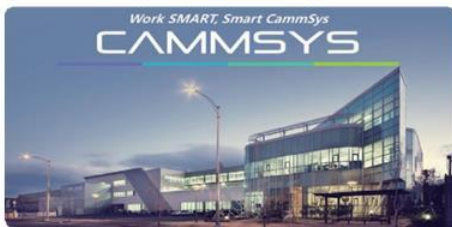
Consultative bodies of e-Mobility research agencies and manufacturing companies

- Korea Automotive Technology Institute Jeonnam Branch (Research body governed by the MOTIE)
- Korea Smart E-Mobility Association (e-Mobility business association recognized by the MOTIE)
- Korea Electric Motorcycle Industry Association (e-Motorcycle business association recognized by the ME)



Yeonggwang Daema EV Industrial Complex (14 investors)

- CAMMSYS (micro EV), DAEPOONG (electric bicycle), HB (electric scooter)
- Signet System, GAGA (EV charging station)



Upstream and Downstream Industries

Rechargeable battery

Research

EV Rechargeable Battery Recycling Research Center

Business

Companies of Innovation Industrial Complex (incl. GAGA), POSCO Chemical



Lightweight Materials

Research

Korea Testing & Research Institute

Business

POSCO, chemical companies of Yeosu Industrial Complex



Business Model

Ultimate destination to realize a variety of business models incl. urban, Rural, Tourism, Island and more





e-Mobility Industry Vision and Strategy

Vision and Objectives

Vision

Global e-Mobility Hub

Objectives
by 2025



Business X 100

14 → 100



Employment X 10

200 → 2,000



Sales X 10

US\$ 30 million → US\$ 300 million

Strategy

1

Designate
“Regulation-
Free Special
Zone”

2

Set up “Testing,
Evaluation and
Certification
Systems”

3

Create “Import
Replacement
Parts Eco-systems”

4

Develop
“Business
Models

5

Expand
“Industrial
Base and
Human
Resource”

e-Mobility Cluster Roadmap

- 5 areas and 17 tasks, US\$ 390m

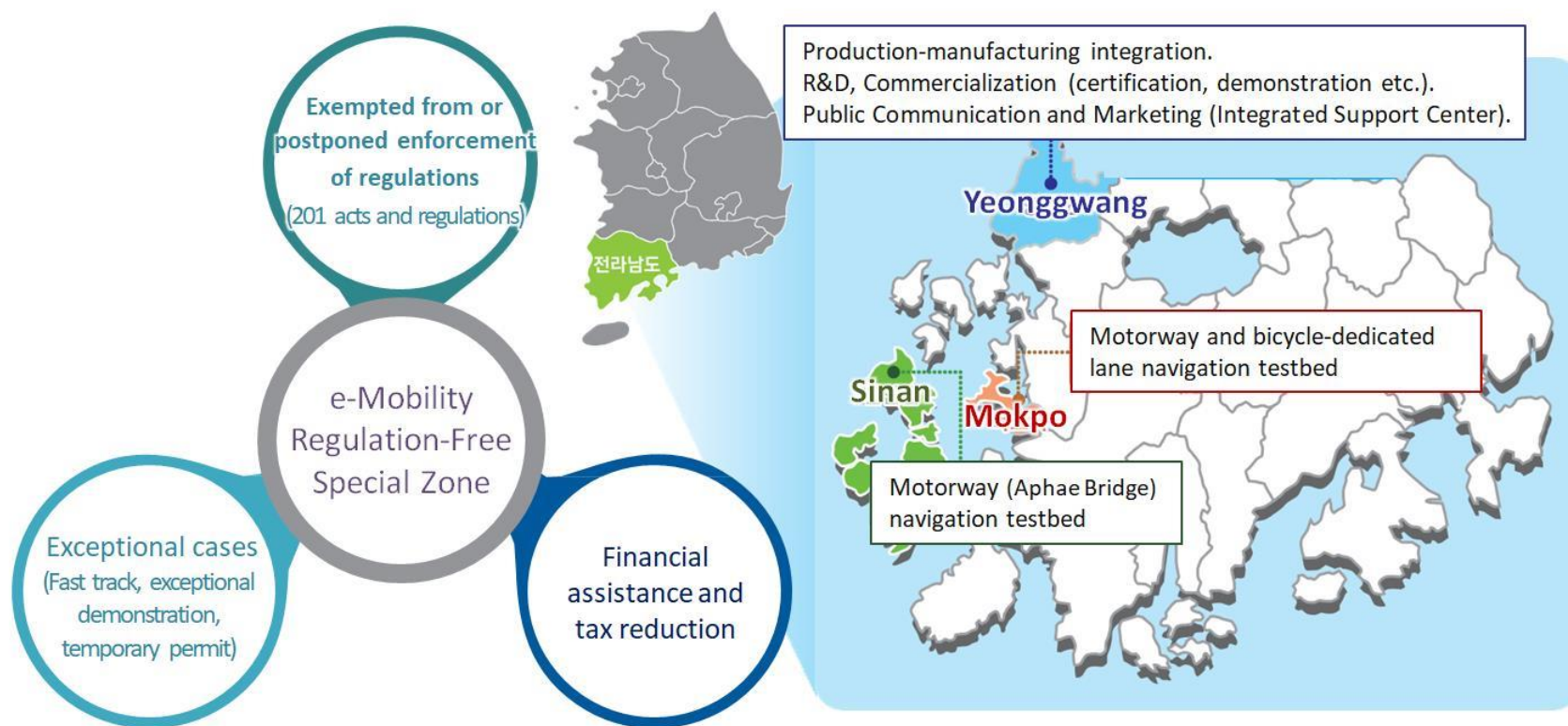
- Central Government: US\$ 190m/ Local Government US\$ 140m / Private US\$ 60m

Strategy	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
Designate “Regulation-Free Special Zone”					Designation of e-Mobility Regulation-Free Special Zone							
Set up “Testing, Evaluation and Certification Systems”	Electric motor powered transportation device demonstration facility setup											
		Future personal mobility user experience lab set-up										
			Autonomous vehicle demonstration testbed									
Create “Import Replacement Parts Eco-systems”					EV open platform development							
					Power system evaluation setup							
					Micro hydrogen fuel cell R&D and demonstration							
					Smart mini-electric shuttle core components & parts technology							
Develop “Business Models”					Micro EV industry promotion service demonstration							
					e-Mobility distribution project							
Expand “Industrial Base and Human Resource”				e-Mobility EXPOs								
				e-Mobility business and human resource empowerment								
				Knowledge Industry Center								
				Specialized Industry Complex								
							Eco-friendly convergence theme park project					

Strategy

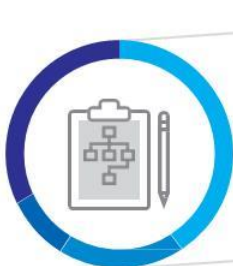
Designate Jeonnam e-Mobility Regulation-Free Special Zone

- 2019~2023 / US\$ 33.41 million / Yeonggwang, Mokpo, and Sinan(Aphae Bridge)
- 5 projects incl. micro EV commercialization and proving ground, and 9 demonstration projects



2. Set up e-Mobility Testing, Evaluation and Certification Systems

- Business support process from design-> prototype-> performance testing through mass production.
- International evaluation/certification support incl. EU certification of core components and parts (TUV SUD, IDIADA)



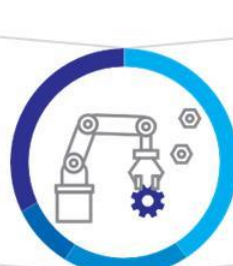
Design-convergent Micro-Mobility Industry Eco-system
(2014~2018 / US\$ 26 million)

- Invitation of research institutes
- Indoor evaluation system setup



Electric motor-powered transportation device demonstration facility setup
(2015~2020 / US\$ 24.65 million)

- Proving ground, crash test lab and open lab



Future personal mobility user experience lab set-up
(2017~2022 / US\$ 13.31 million)

- Design and prototype
- Big-Data platform setup



Autonomous vehicle demonstration testbed
(2021~2023 / US\$ 27.94 million)

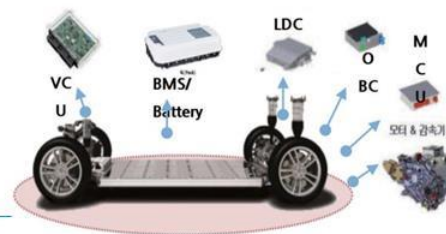
- Autonomous driving testing
- Performance evaluation certification facility setup

3. Create e-Mobility Import Replacement Parts Eco-system

- Import replacement components & parts through EV platform and power system R&D, supports for local parts suppliers
- Import replacement ratio : 2019 (30%) → 2022 (70%) → 2025 (100%)
- Leadership in autonomous driving, hydrogen fuel cell and other future automotive technologies

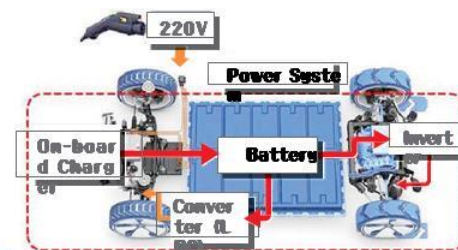
EV open platform

▶ 2019~2021 / US\$ 27.94 million
Micro EV (Passenger, Commercial) open platform, components & parts, modularization SMEs



Convergent device power system stability evaluation facility setup

▶ 2020~2022
Power system test facility setup
(battery, inverter, converter, built-in charging system)



04 e-Mobility Industry Vision and Strategy

Strategy

Micro hydrogen fuel cell R&D and demonstration

- ▶ 2020~2024 / US\$ 30.41 million
- e-Mobility hydrogen fuel cell ((1~5kW) industry to response to incoming hydrogen economy



Smart mini-electric shuttle core components & parts technology

- ▶ 2021~2025 / US\$ 37.45 million
- Self-driving shuttle service system and other related system development



4. Develop e-Mobility Business Models

Micro EV industry promotion service demonstration

- 2019~2025 / US\$ 39.45 million
(Yeonggwang, Mokpo, Muan, and Sinan)
- Development and demonstration of various business models incl. public transportation service, home delivery service, welfare services and tourism etc



e-Mobility distribution project

2020 ~ 2025 / US\$ 14.79 million (Priority is given to tourist spots and remote islands)

Micro EV

Gradual increase starting from government institutions/ agencies towards private sectors (total 20,000)

e-Mobility

Local government's electric scooter projects (total 50,000)

Expanded infrastructure

Charging stations at public installations (total 2,000)

Public communications

Attending local occasions (festival etc.) and community meeting

5. Expand Industrial Base and Human Resource

- Attract more investors through human resource development and empowerment, R&D, living condition improvement and tailored support package provision
- e-Mobility EXPOs to build and strengthen local/international business network

Expansion of Specialized Industrial Complex



- 2021~2024 / US\$14.79 million
- 350,000m², Industrial lots, Integrated Support Center, etc.

Knowledge Industry Center

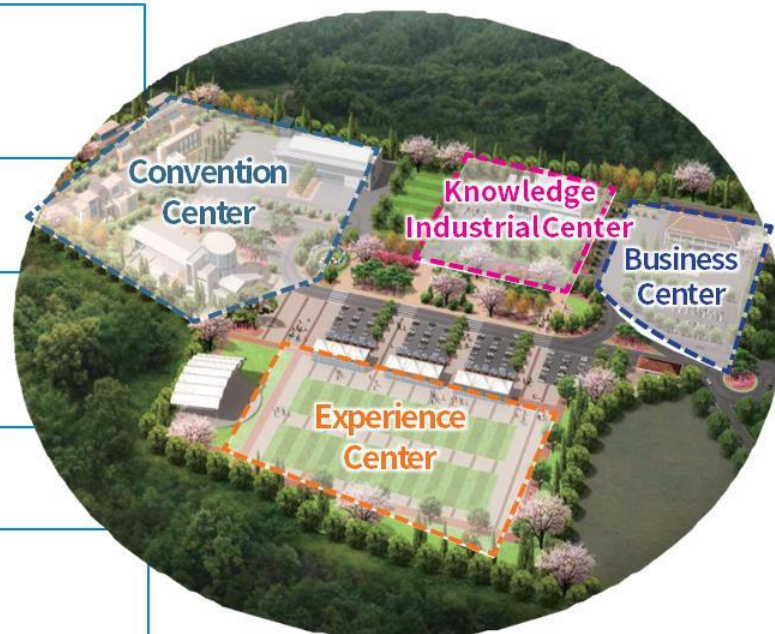


- 2019~2021 / US\$ 19.72 million
- Office premise, open R&D installations (40 rooms)

Eco-friendly convergence theme park project



- 2022~2025 / US\$36.98 million
- Exhibition, hands-on opportunities, combined leisure complex



e-Mobility Expo

(2018~2025 / US\$ 17.26 million)

- Korea's first e-Mobility-specialized industry exhibition
- Academia-business-research-and-public technology & information sharing partnership
- Convention center construction



Business Support & Human Resource Development

(2019~2025 / US\$ 8.21 million)

- Customized R&D projects
- Internship program with Mokpo National University, Suncheon National University and Chonnam National University
- e-Mobility courses in Yeonggwang Vocational-technical High School





Collaboration with Related Industries by Regions

Collaboration with Related Industries by Regions

Central Region

New energy industry
+
AI, IOT convergence components
& parts industry development

Advantages

- Energy companies incl. KEPCO
- EV Rechargeable Battery Recycling Research Center

Direction

- e-Mobility high-tech convergence components & parts industry development
- e-Mobility rechargeable battery industry development

Western Region (Focused on Yeonggwang)

All-in-One business support system
incl. R&D, evaluation and certification
infrastructure as well as human
resources development

Advantages

- Integration of e-Mobility Research
- Center, Knowledge Industry Center, associations and businesses

Direction

- Import replacement components & parts industry support for creating upstream and downstream ecosystems
- Increasing global presence through special industry zones and international exhibitions

Eastern Region

Hydrogen fuel cell and parts &
material production hub

Advantages

- Hydrogen fuel cell manufacturers incl. POSCO Chemical
- New ultra-lightweight metallic material industry infrastructure

Direction

- e-Mobility hydrogen fuel cell development
- Lightweight components & parts industry development

The Future of automotive industry Starts in Jeonnam
e-Mobility Industry Cluster.

Thank you





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