Operation of EV and EV Charger Based on New & Renewable Energy on Jeju

Low carbon division,
Jeju Special Self-Governing Province
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Jeju, Turning Climate Crisis into Growth Opportunity

1 Paris UN Climate Change Conference (2015 COP21)

Introduction to Jeju's "Carbon Free Island" & "Green Big Bang" Vision

2 Jeju's Green Big Bang model draws global attention (2017 Davos Forum)

"Jeju triggers a big bang integrating technology and infrastructure"

3 The CFI policy links energy, transport, electric power system, and big data, and creates a new integrated model of energy and mobility to make Jeju a carbon-free island.

Jeju

Annual tourists of over 15 million

- **Over 15 million tourists a year visit Jeju**
- **Environmental Treasure Island: only region in the world to be awarded UNESCO Triple Crown**
  - Biosphere Reserve (2002), World Natural Heritage site (2007), Global Geopark (2010)
  - New 7 Wonders of Nature (2011)

Mega city (60)

- **2-hour flight away from cities with 1M population**

Optimal location for low-carbon green industry

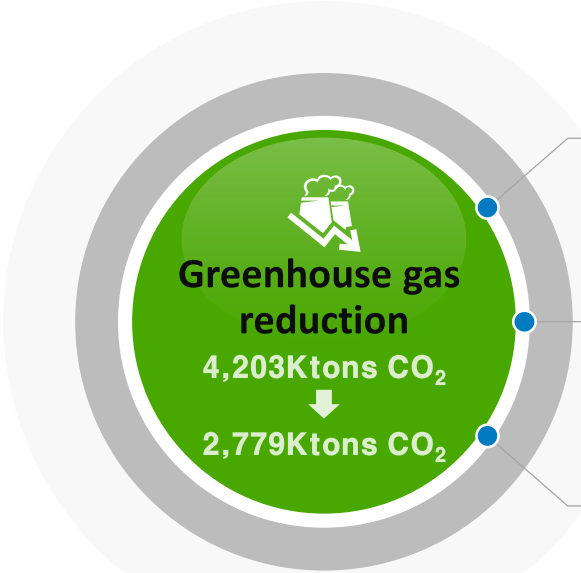
- **Travel around the whole island on a single charge**
- **Abundant renewable energy resources such as wind and solar power**
- **Establishment of infrastructure for smart grid demonstration complex**

Jeju Carbon Free island vision 2030

100%
New & Renewable energy

100%
Eco-friendly mobility

Carbon Free Island 2030 Project



Cleanness

Harmonizing with
the environment of Jeju

Stability

Stable energy supply
And demand structure

Growth

Jeju people-led industrial
Ecosystem innovation

by 2030

- Meeting 100% of Jeju's electricity demand with new & renewable energy
- Replacing 377,000 registered vehicles (75%) with eco-friendly EVs
- Reducing energy demand by 23.4%
- Facilitating new energy-related industries

Renewable energy and ev-based carbon reduction project

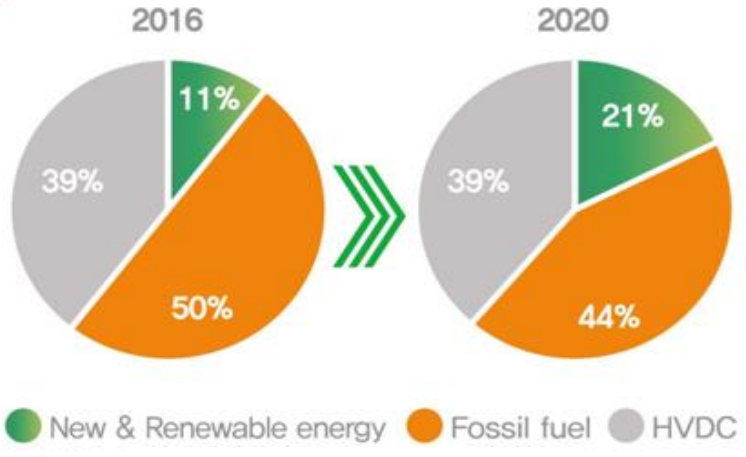
Carbon Free Island Project

Since 2012

- Transition to eco-friendly energy and mobility
- Improvement of energy independence
- Pursuing environmental, social and economic values simultaneously

New & Renewable energy generation

Highest New & Renewable energy generation rate in Korea (16.2%)
80% of government target reached



Enhanced energy independence due to increased RE generation
(Reduced HVDC dependence)

First 8MW floating offshore wind farm pilot site in Korea

Electric Vehicles

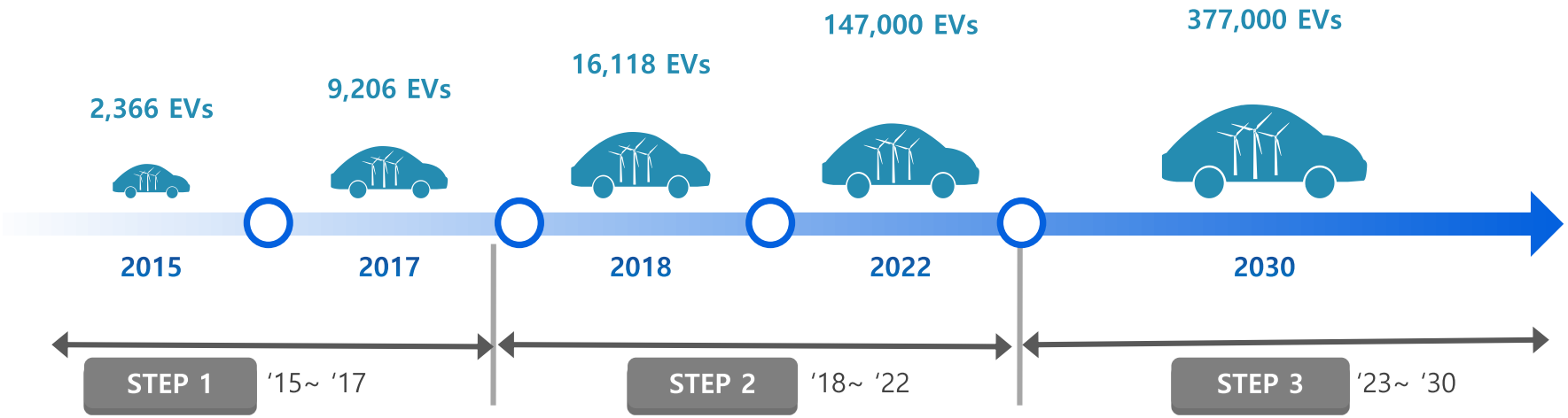
First in Korea
to record 23K EVs

New registration of ICE
vehicles banned from 2030

Life cycle management
of EV battery

Roadmap to Promote EV

A global mecca of electric vehicles running on wind for the realization of Jeju, a carbon-free island
Announced mid- to long-term comprehensive plan for increasing EV penetration and nurturing industry (‘15. 9.16.)
Converting 100% of operating vehicles to electric vehicles, building charging infrastructure throughout Jeju



Birth of the electric vehicle industry ecosystem

Establishing an electric vehicle global platform

Establishing a self-sustaining industrial ecosystem for electric vehicles

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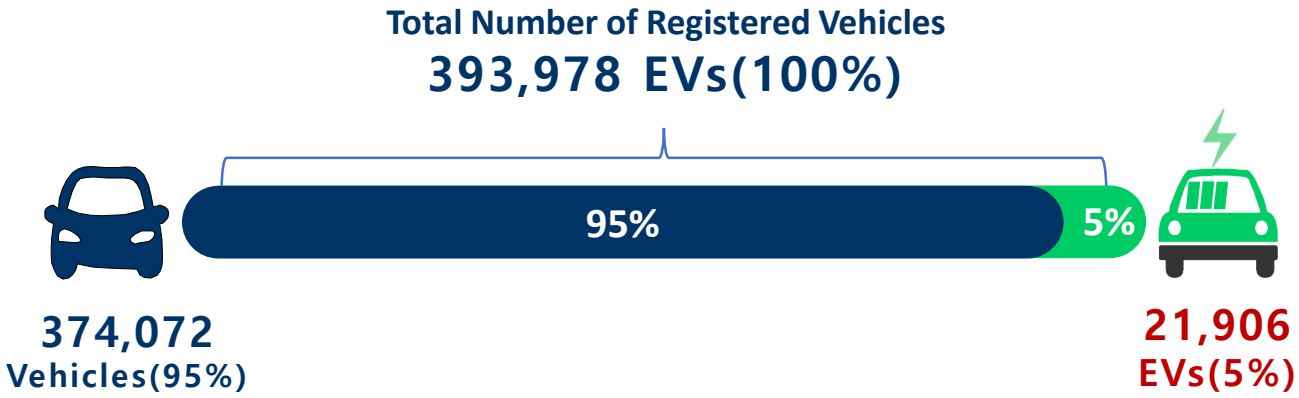
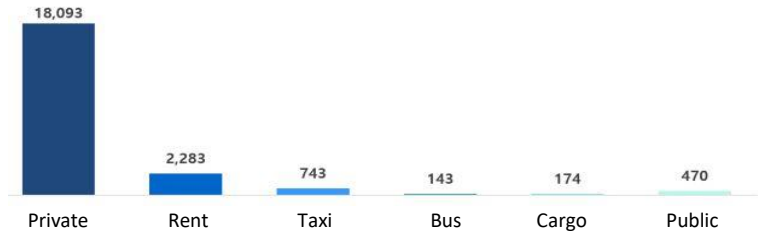
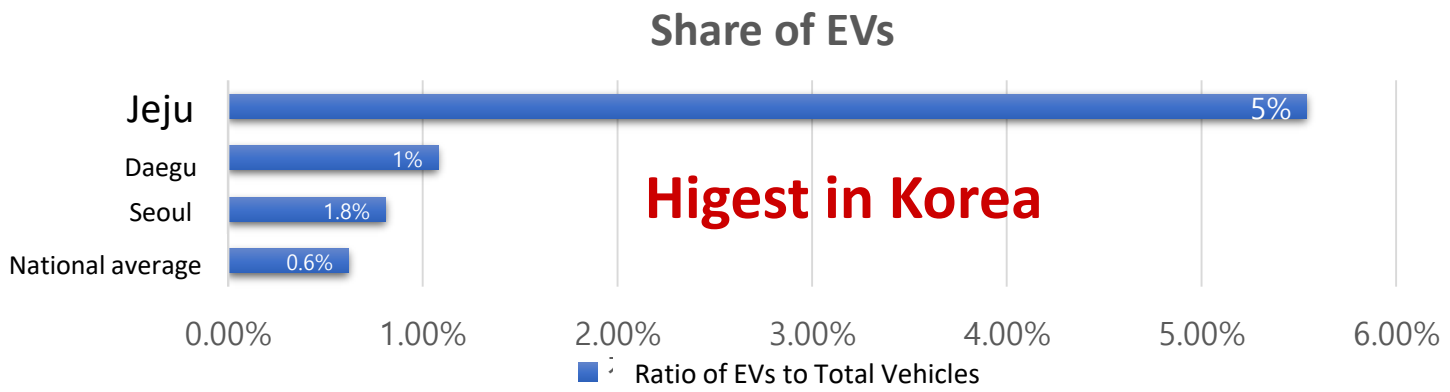
Electric Vehicle Registration Status In Jeju



Registration status by vehicle type

Category	Private Vehicle	Biz Type				Public	Total
		Rent Car	Taxi	Bus	Cargo		
Registration	18,093	2,283	743	143	174	470	21,906
Ratio	82.6%	10.4%	3.4%	0.7%	0.8%	2.1%	100.0%





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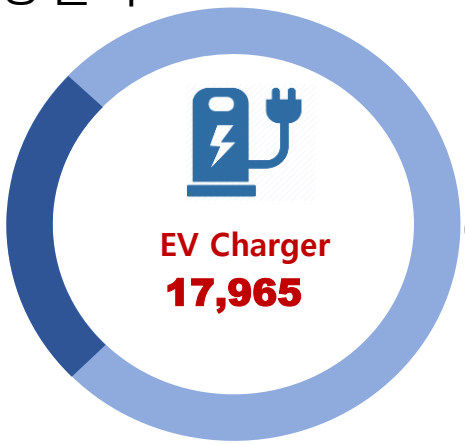
EV Charging Infrastructure in Jeju

Number of EV charger in Jeju
충전기

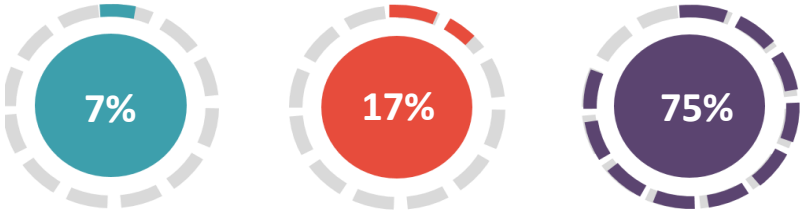
Open Type Charger
4,434
Slow 3,113(17%)
Fast 1,321(7%)



Private Charger
13,531
Slow 13,016(73%)
Fast 515(3%)

As of April 2021, a total of 17,965 electric vehicle chargers are in operation, 16,129 slow and 1,836 rapid chargers.

By owner type



Government 1,329 (5%)

Private business 3,105 (18%)

Personal 13,531 (77%)

The nation's best charging infrastructure
Number of chargers per 1 EV (2020)

Jeju 0.9

Nation wide 0.5

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Various EV Chargering Infrastructure in Jeju

Home Charger Dissemination

- Dedicated chargers for houses, offices, rental cars, etc.
- Charger installation subsidy for electric vehicle buyers(~2019)

Establishment of Open Charger

- Government offices and public parking lots
- Residential facilities such as apartments
- private commercial facilities
- Tourist attraction, etc.

Establishment of customized charger

- Charger for vulnerable road users
- EV bus Charger
- Socket Type Charger (fee-charging)

EV Charger subsidy policy

	Fast charger Installation	Slow charger Installation
Period	2019 ~	2013 ~ ※ Home charger support ends in 2019
Institution in charge	Ministry of Trade, Industry and Energy, Korea energy agency	Ministry of environment, Korea environment corporation
Grant recipient	Private charging business	Charger owner
Subsidy Amount (As of 2021)	(gov.) up to $16,400 (pro.) $6,400 ※ based on 50kW	(gov.) $1,820
Subsidy type	Government and province budget	Government budget ※ provincial support until 2018

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Policy to increase EV driver convenience

❖ Jeju EV call center (1st in Korea)

- Opening date : 2015. 4. 6.
- Working hours : 24/7 all year round
- Staff : 11 people (1 manager, 1 assistant manager, 7 consultants, 2 field workers)
- Responsibilities
  · EV and charger policy guidance
  · customer service (inquires, malfunction reception),
  · emergency service

❖ Production and distribution of 'Happy charging station' map

- Recipient : EV drivers (provincial residents, rental car companies etc.)
- guidance on charger location, user manual, using etiquette, etc.

❖ Crackdown on charging disruption & promotion of charging etiquett

- Regulatory area : Public institutions, public facilities and public parking lot with at least 100 parking spaces, apartments with over 500 households
- Development and installation of automatic monitoring equipment: 35 charging stations

❖ EV Supporters

- **Monitoring of charging stations in Jeju**
- Promotion of EV policies via social media
- Sharing opinions on EV experience

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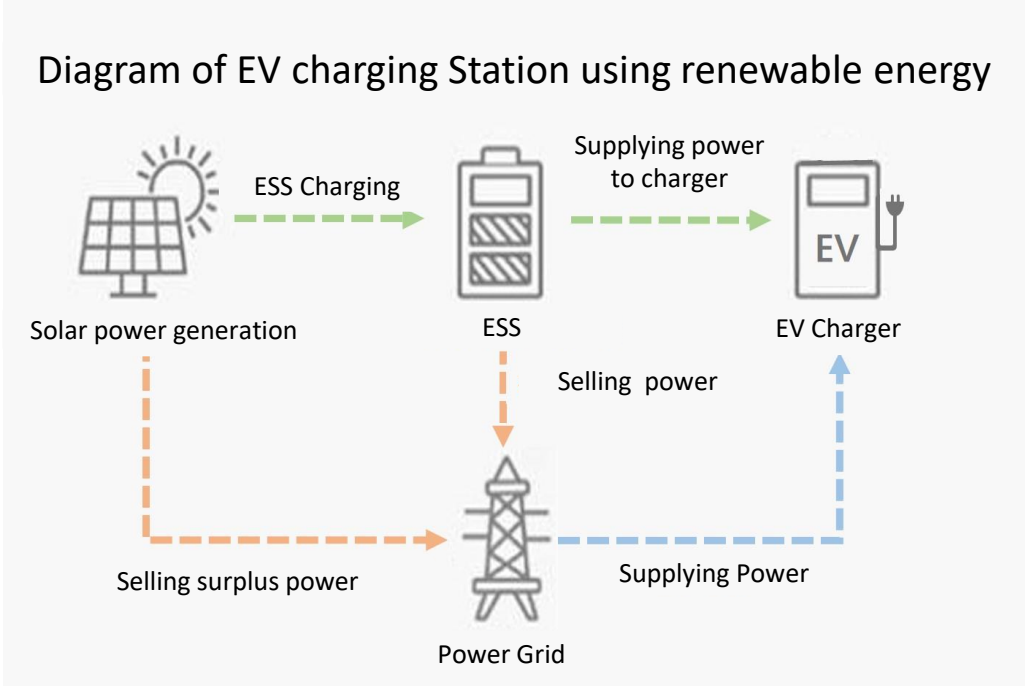
(Case 1) EV Charging Station using renewable energy



A system that supplies EV chargers with electricity from renewable energy (PV) and sells the remaining electricity to the power grid

- Planning to build 6 sites on Jeju between 2019 and 2022

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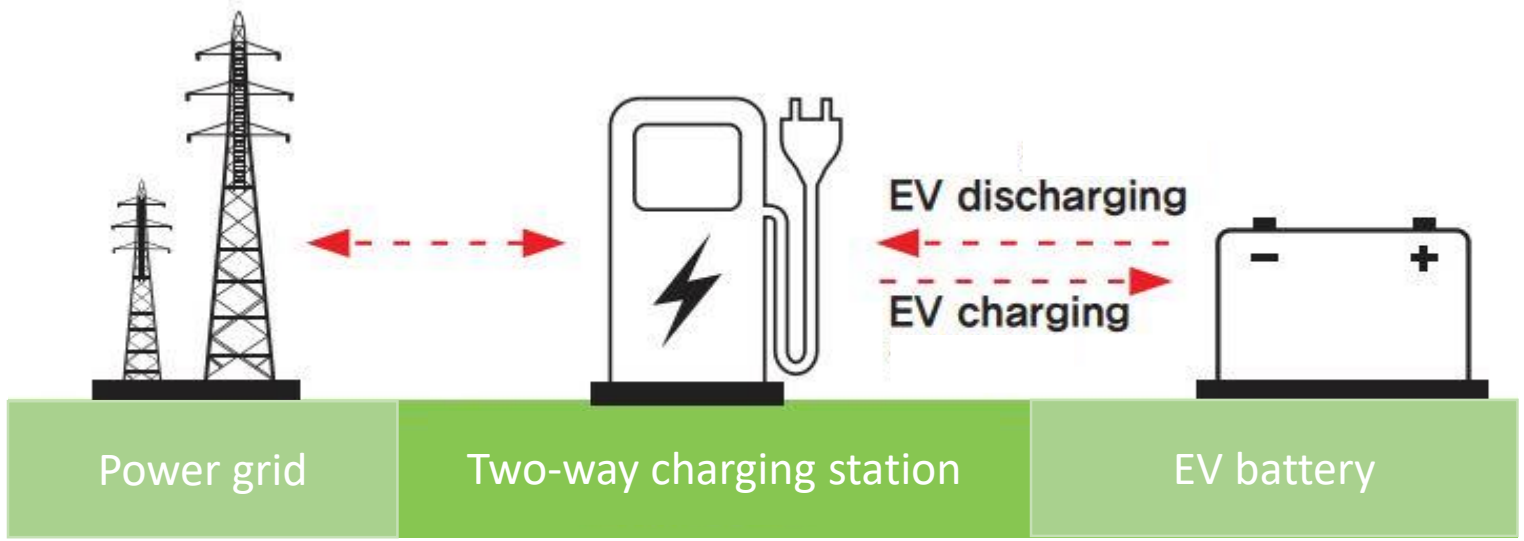
(Case 2) Smart Grid V2G Charger



(Stage1)
Pilot project
Jeju government fleet

(Stage2)
Expansion of Pilot project
Target : Public institutions and rental car companies

(Stage3)
Expansion of supply and vitalization of related industries
Used as power storage

Two-way power transmission between EVs and charging stations & External control system for charging and discharging

- Responding to the increase of renewable energy generation and free trading of electricity by establishing and operating a two-way power transmission system (in phases 1,2,3) and achieving stable commercialization.

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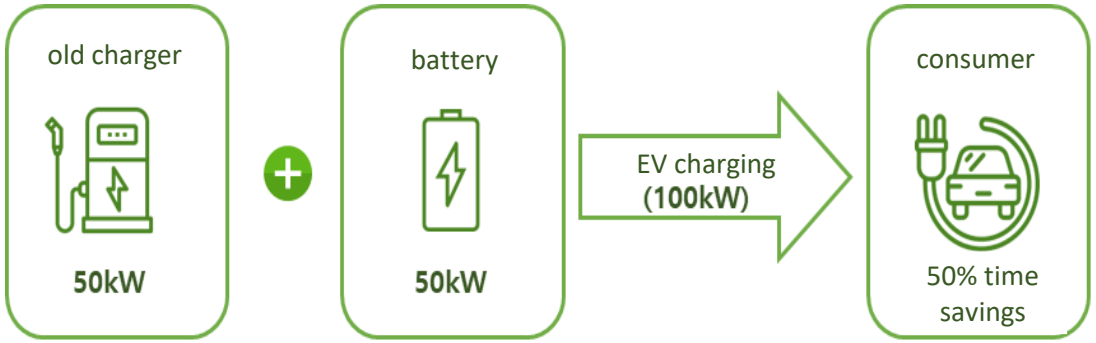
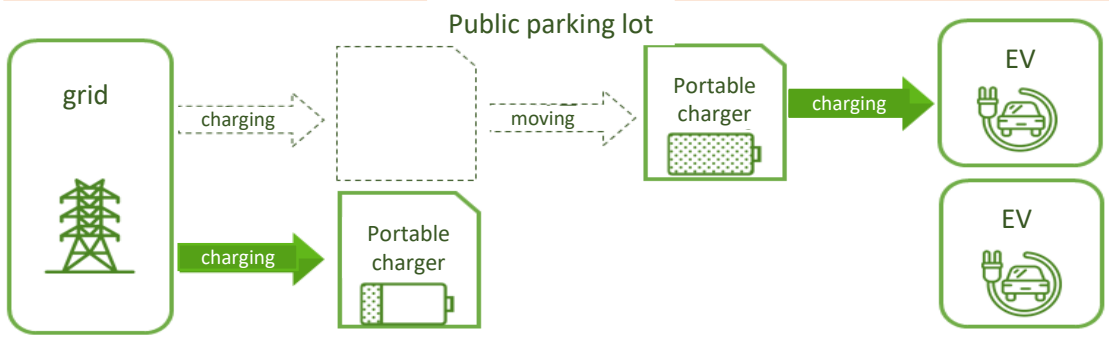
(Case 3) Special Regulation-Free Zone for EV charging Service

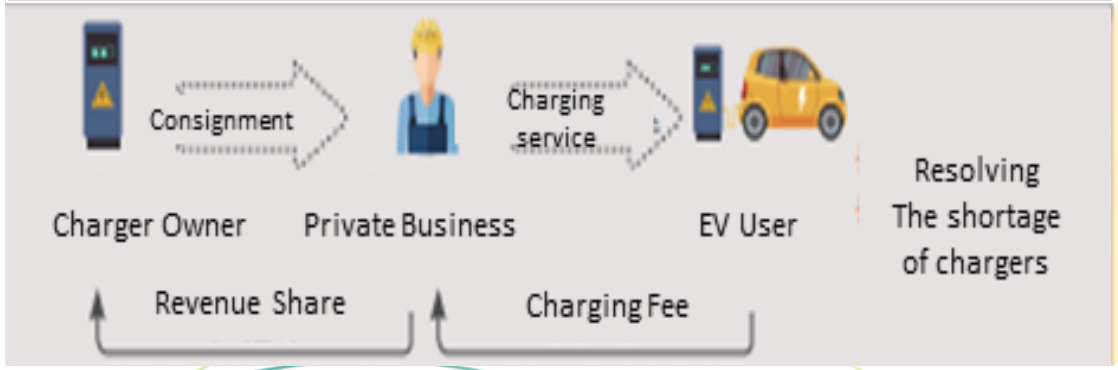
Infrastructure improvement to reduce charging time



Portable charging service to minimize occupied space



Charger sharing platform to increase efficiency



Charging data-based EV inspection service

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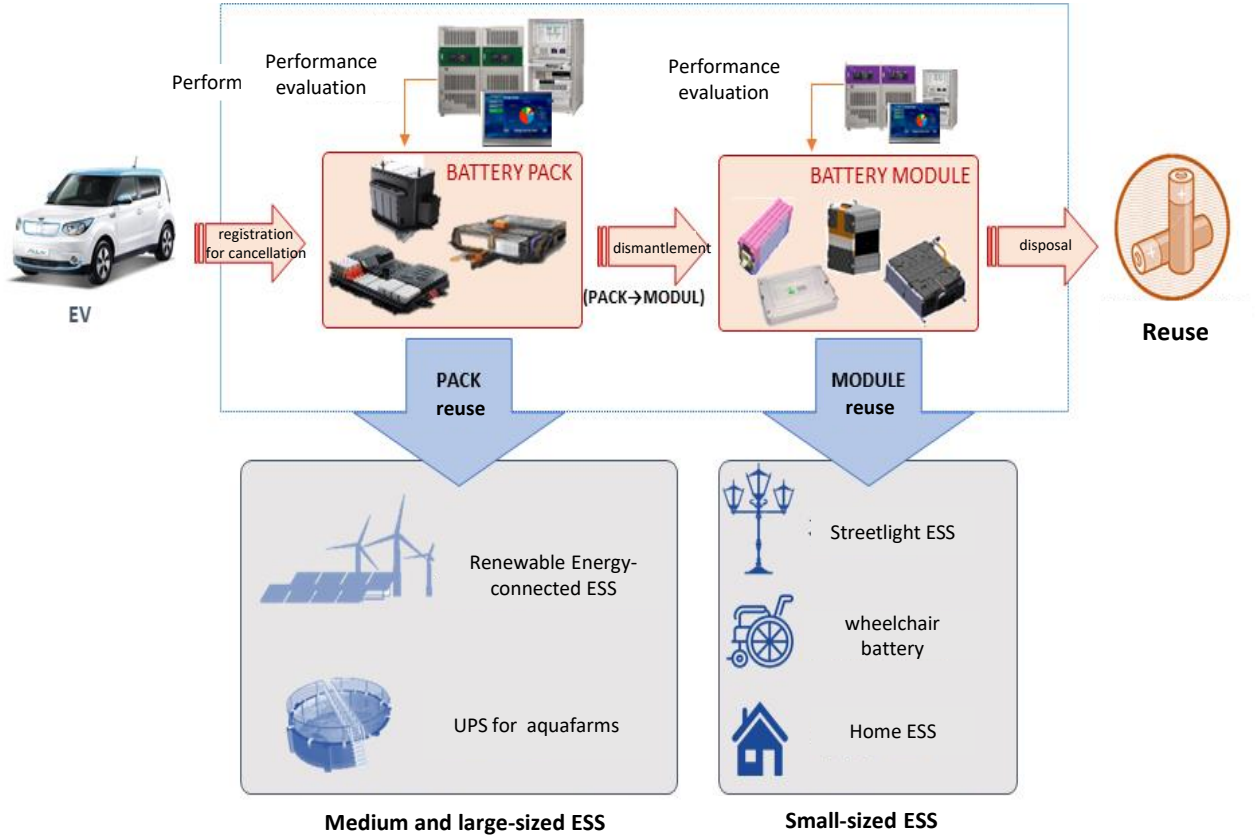
(Case 4) Infrastructure for Life cycle management of EV battery

Life cycle management of EV waste battery



Establishment and Operation of Battery industrial center

(Stage 1) Framework for EV battery collection and residual evaluation (2019)
(Stage 2) Establishment of safety assessment system for fixed products (2022)
(Stage 3) Establishment of safety assessment system for portable products and support for examination of private products (2024)

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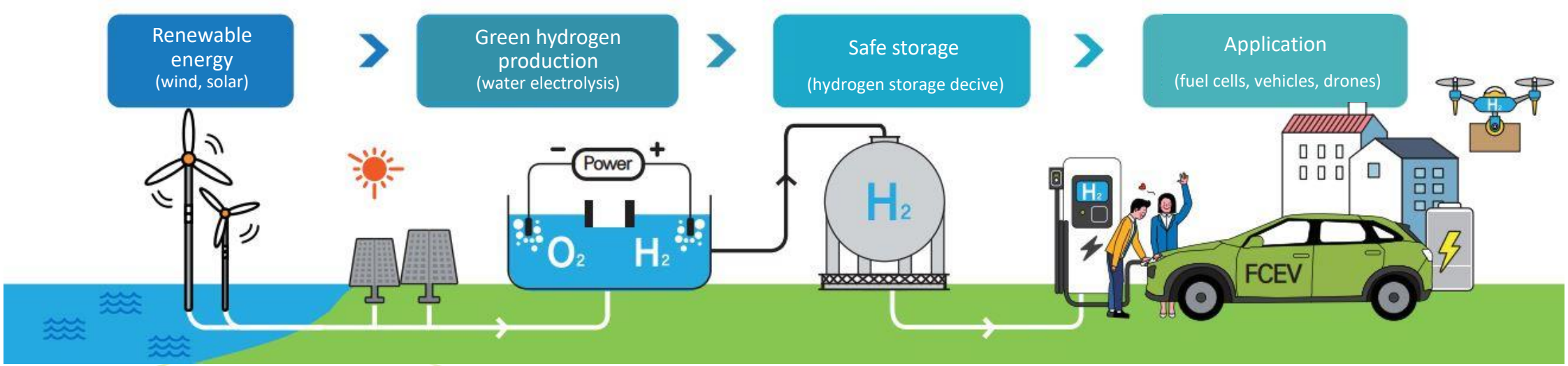
(Case 5) New & Renewable energy based Hydrogen-charging station

Production, Storage, Application of Green Hydrogen

- Paradigm shift in clean energy
- Designation of green hydrogen pilot production as national project
- Designation of Special Regulation-free Drone Zone




Jeju, Green New Deal Frontier
그린뉴딜 프런티어 제주
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to global achievements.
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