



Activities of LSIS on EV Infrastructure in Korea

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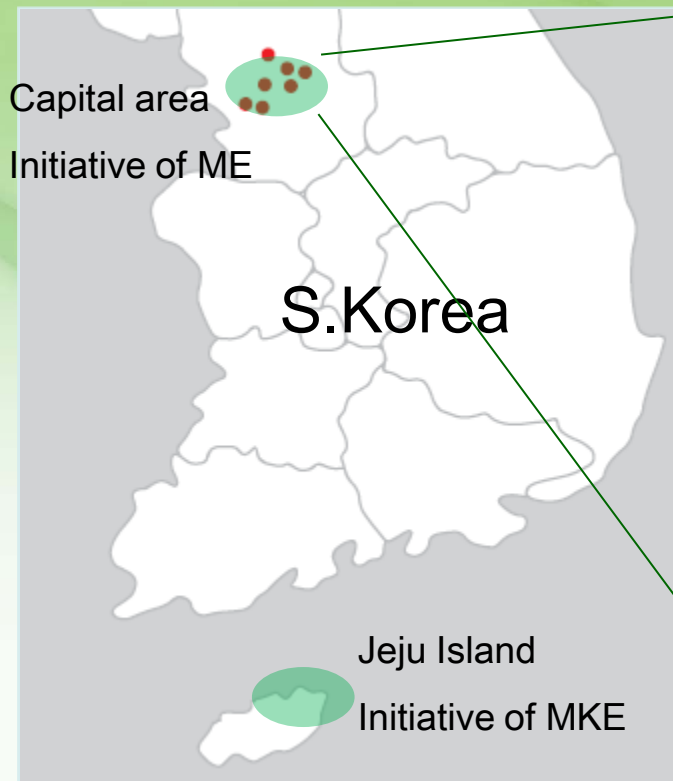


1. The Demonstration Site of Capital Area by Initiative of Ministry of Environment
2. The Demonstration Site of Jeju Island by Initiative of Ministry of Knowledge and Economy
3. Activities for Korean Standard
4. Charging Stand of LSIS
5. Suggested national policy
6. Practical Review points



1. The Demonstration Site of Capital Area

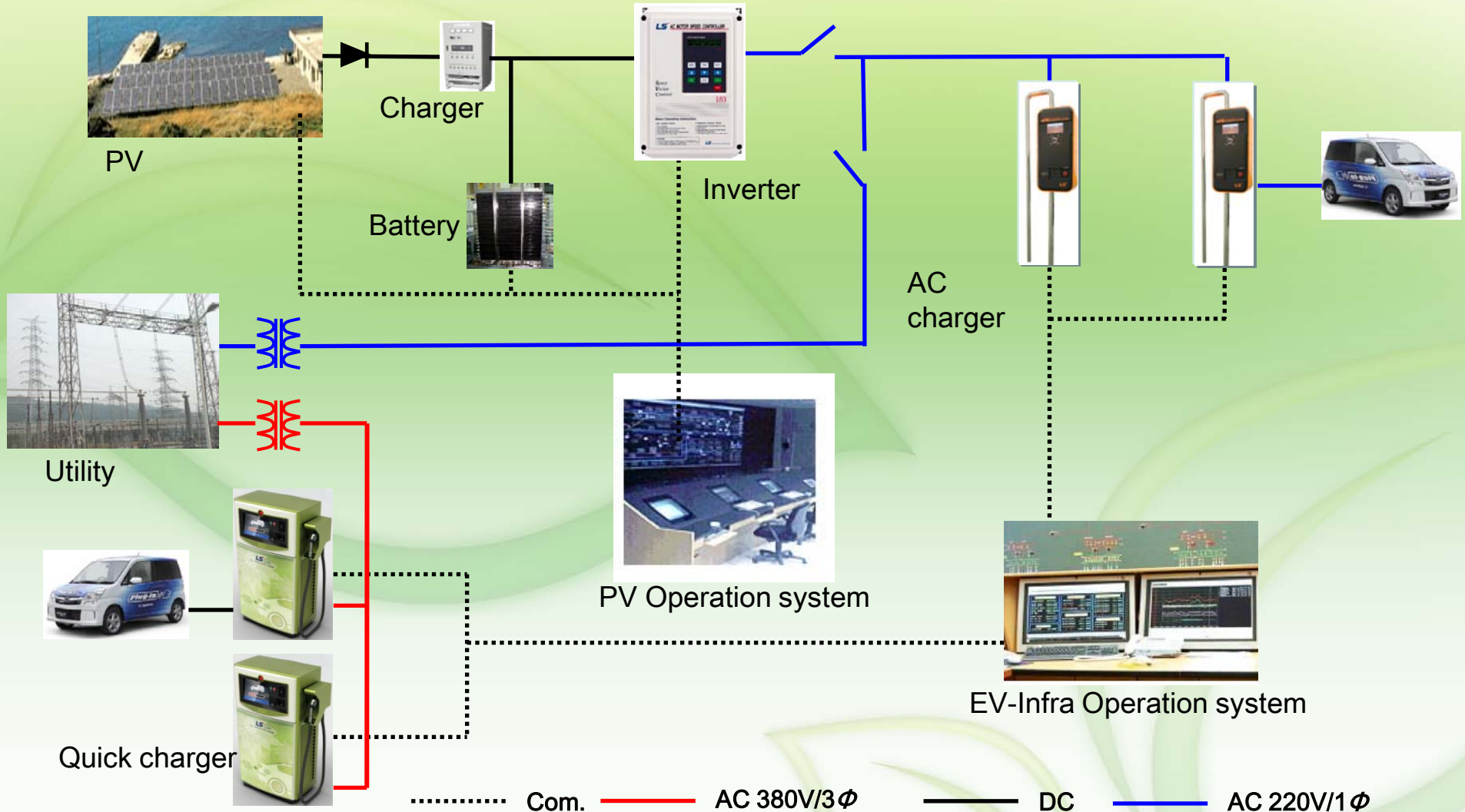
- ◉ LSIS is the first company that built up the EV-charging infra. in the KOREA (for the Korea Environment Corporation).
- ◉ KECO(Korea Environment Corporation; Agent of ME) builds up some demonstration sites for the PV integrated system(charging infra + solar power systems) with LSIS.





1. The Demonstration Site of Capital Area

◎ System Configuration





1. The Demonstration Site of Capital Area

◎ Network





1. The Demonstration Site of Capital Area

© Pictures of Installation



Inverter

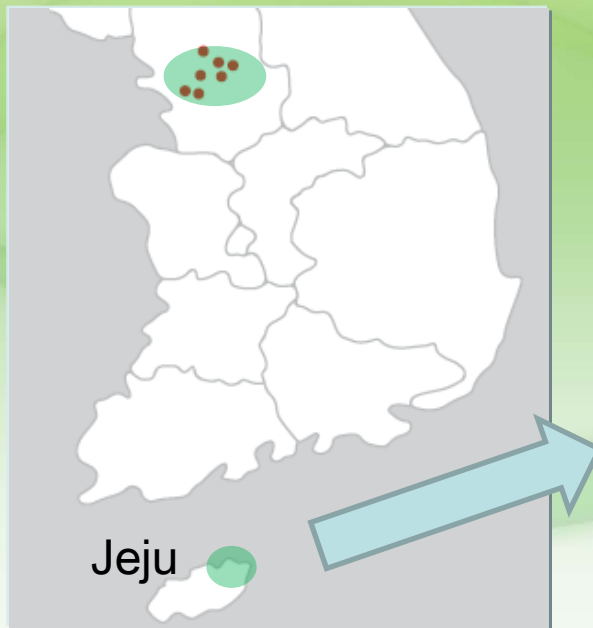


Solar panel



2. The Demonstration Site of Jeju Island

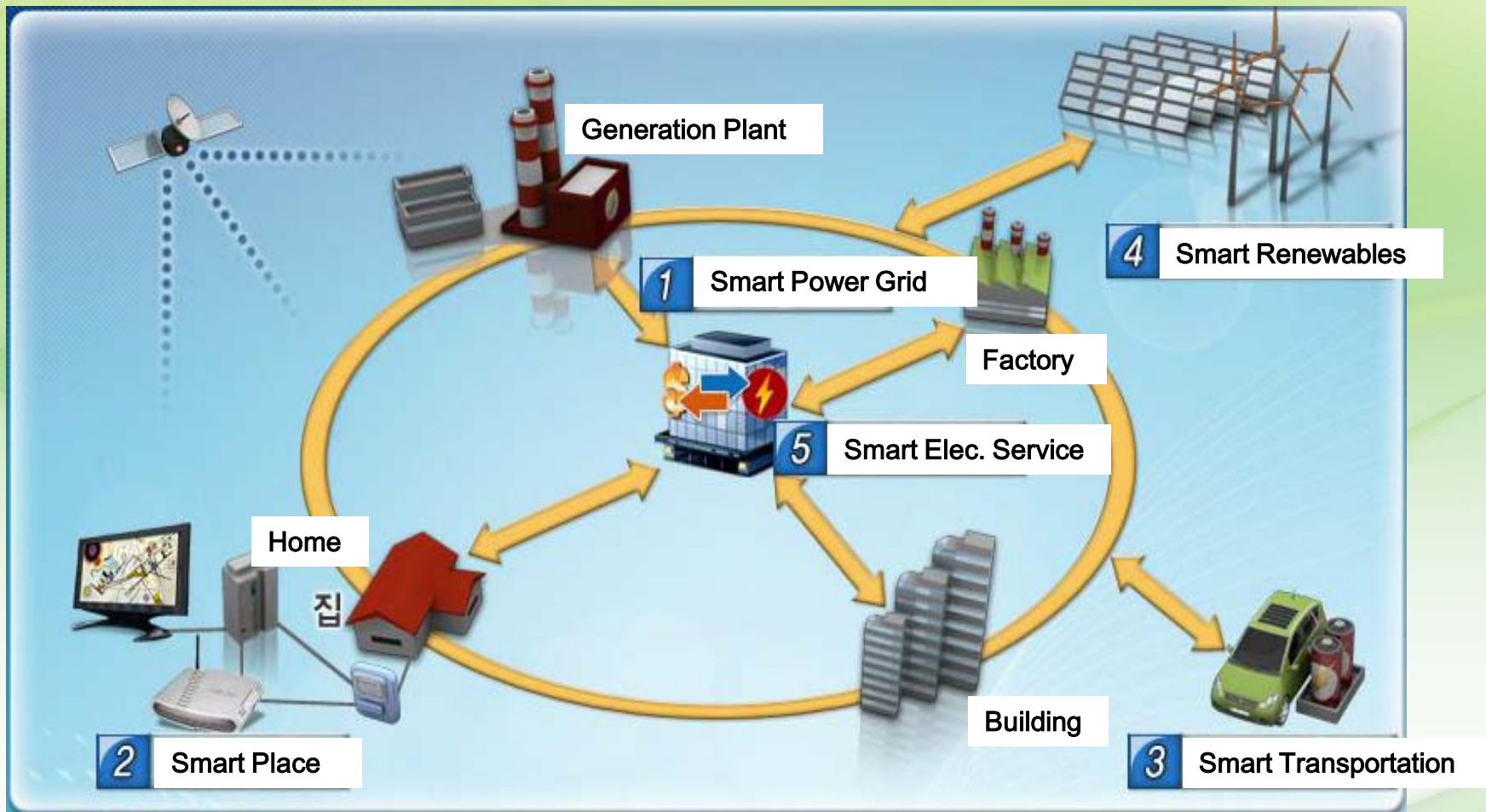
- ◎ Korea Ministry of knowledge and Economy initiated the first NSGTA (National Smart Grid Test Area) in Jeju island.





2. The Demonstration Site of Jeju Island

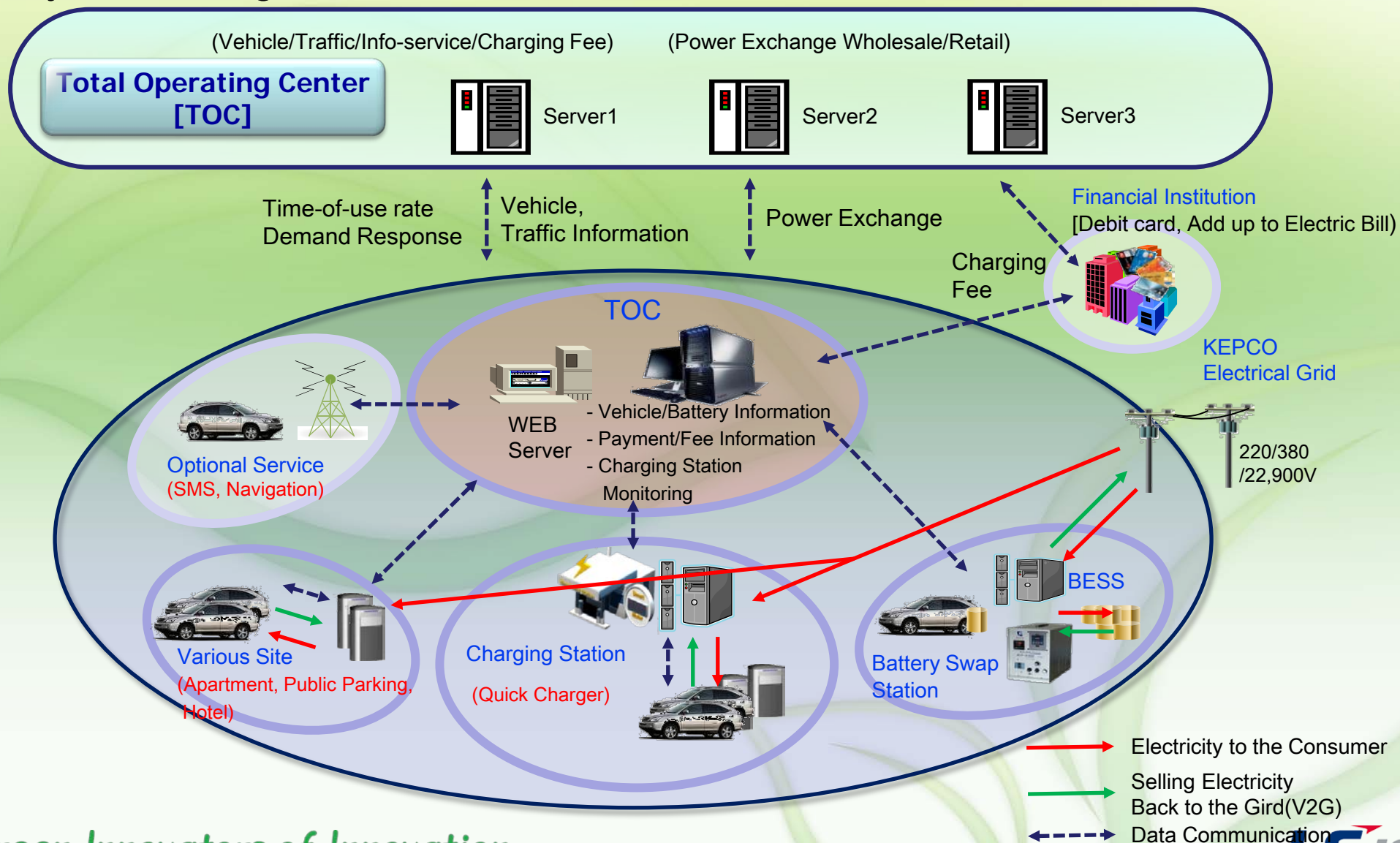
- © The Smart Grid Test Area in Jeju Island consists of 5 categories including EV Charging Infrastructure.





2. The Demonstration Site of Jeju Island

◎ System Configuration



2. The Demonstration Site of Jeju Island

◎ Pictures of Installation



Parking Lot at
Smart Grid Showroom



Lotte Mart
(Discount Store)



Sightseeing place



3. Activities for Korean Standard

◎ Korean National Standard would be released in 2011.

Step	Action	Remark
2009. 12.	□ Gov. supported the Working Group organized with 20 experts on related technical area	□ The 1 st Activity for Standardization of AC and DC Charger
2011. 1.	□ 1 st Draft released for a Group Standard	□ Based on IEC 62196, SAE J1772, JVES 105, IEC 61851-1, 22.
2011. 3.	□ ATS(Agent of Technology and Standard) announced to accept “the Draft” as the preliminary Korean National Standard	
2011. 6.	□ 1 st Draft released for Korean National Standard	
2011. 9.	□ Public forum for National Standards	
2011. 10.	□ Finalize standardization for AC•DC charger	



4. Charging Stand of LSIS

◎ Charger for Demonstration Sites

Item	Spec.
AC Charging Power Output	Level II : SAE J1772
AC Power Input	7.7[kW] (220[V] at 35[A], 2 ϕ)
Automatic Plug-out Detection	SAE J1772 or Other methods
Power Measurement accuracy	1[%]
Communication	Wire and(or) Wireless
Outdoor Rated	IP44
Operating Temperature	-20 ~ 55[°C]
Operating Humidity	Up to 95[%] non-condensing



Item		Spec.
Rated capacity		50[kW]
Output	Voltage	DC 450[V]
	Current	DC 110[A]
Input	Voltage	AC 380[V]
Outdoor Rated		IP33
Communication		LAN, CAN, CDMA RS232, 485
efficiency		92[%]



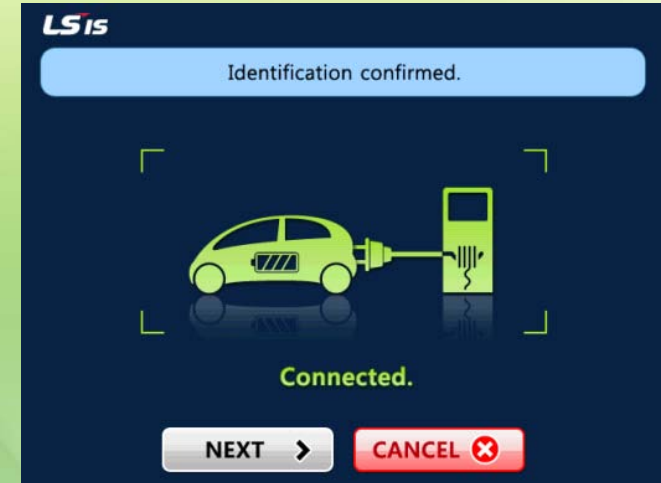


4. Charging Stand of LSIS

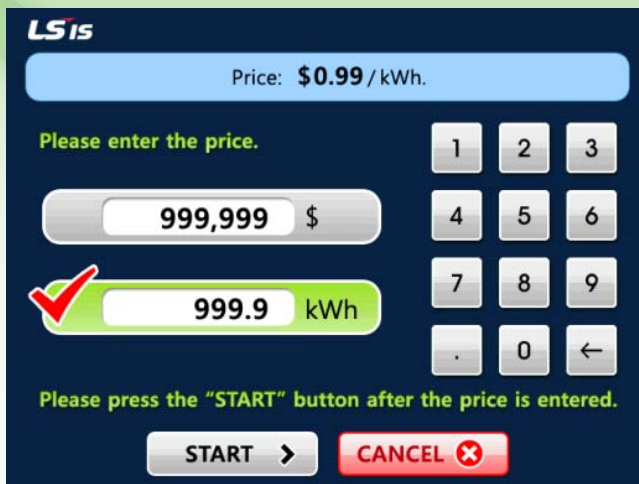
⊙ LCD Display of AC Charging Stand



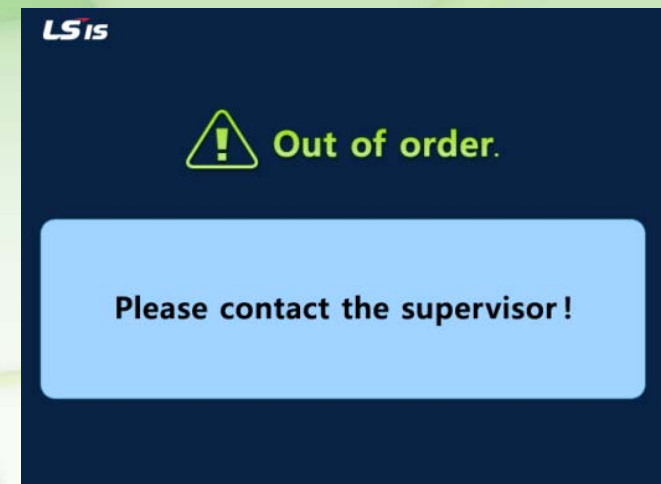
RFID Card checking



Connecting the cable



Enter the fare



4. Charging Stand of LSIS

◉ Charging Stand for Deployment

Vehicle Interface	SAE J1772 EV connector
AC Charging Power Output	MAX 7.7[kW] (220VAC @ 32A)
AC Power Input	AC 220[V] (L, N, Earth)
Fault Protection	ELCB 30[mA], 0.03[s] (Ground Fault, Over Current, Short, Leakage, Electric Shock)
Operating Temperature	-25 ~ +55[°C] ambient
Operating Humidity	5 ~ 95% non-condensing
Approximate Weights	About 50[kg]
Metering Accuracy	1[%]
Surge Protection	6[kV]
EMI Compliance	Class A
Display Screen	Negative Segment LCD (VA)
Network	CDMA (SMS)
RFID Reader	ISO14443 (A/B) Mifare(A/B)
Enclosure Protection	IP44
Dimensions (mm)	220 x 230 x 1400





5. Suggested national policy

- ◎ Strategy for deployment is to begin with establishing Hub cities for EV, then integrate each Hub city and expand to wide area/metropolitan.

Strategy of EV Deployment





5. Suggested national policy

- ◉ To integrate charging Infra. into the National level Operating System, Standards for Information and Installation are highly required.

information system for charging infrastructure





5. Suggested national policy

- © Various operation models have to be developed.



Urban
Operation Model



Suburb/Sightseeing Site
operation model



Local Operation Model



6. Practical Review points

1. Ice and mischief



- ◉ In winter, the door is not opened because of ice by snow and cold rain.
- ◉ Emergency STOP switch is frequently pushed by someone's mischief.



6. Practical Review points

2. Canopy

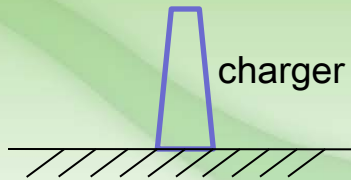


Fig. (a)

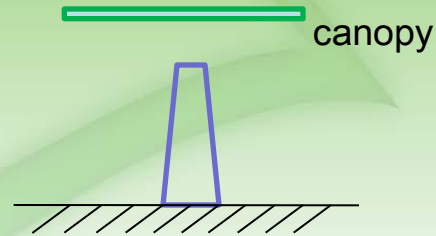


Fig. (b)

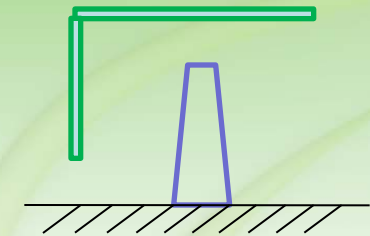


Fig. (c)

© Fig. (a), (b) are not sufficient to protect the human, charger from rain, snow, wind.

© Fig. (c) is the final suggestion.



6. Practical Review points

3. Human safety



- © This picture is found at a personal blog.
- © Monitoring system such as CCTV and public education are needed.



6. Practical Review points

4. Hardness of cable(Jeju Island)



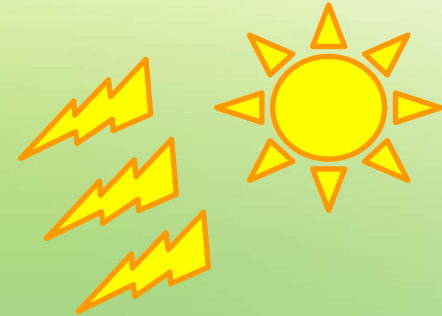
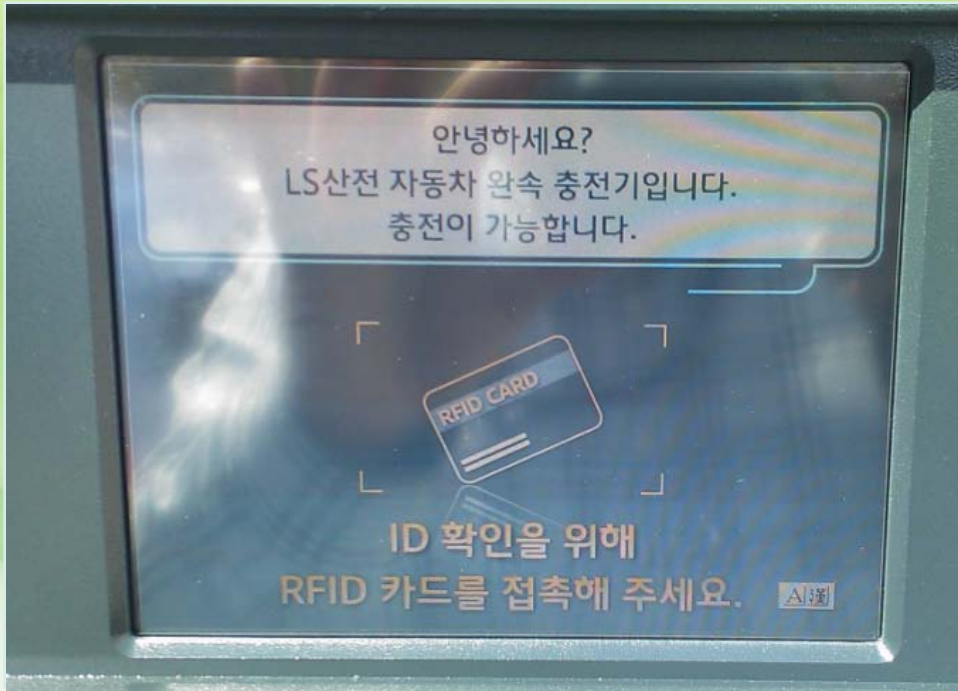
Cable

- ◎ Smart grid test area(Jeju island) has type “C” connector.
(Cable is always attached to main body).
- ◎ In winter, hardness of cable is too rigid to handle by weak person(Lady, ...).



6. Practical Review points

5. Visibility of Graphic LCD



- ◎ Color graphic LCD with touch panel is very useful to display the data.
- ◎ Guaranteed visibility under sun-light needs high cost.



6. Practical Review points

6. Capacity of distribution line



- ◎ Max power consumption is 110[kW](=10+50x2).
- ◎ Installation of additional (low voltage) distribution line is big cost.



Thank you for attention!

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