



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
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1. The Demonstration Site of Capital Area

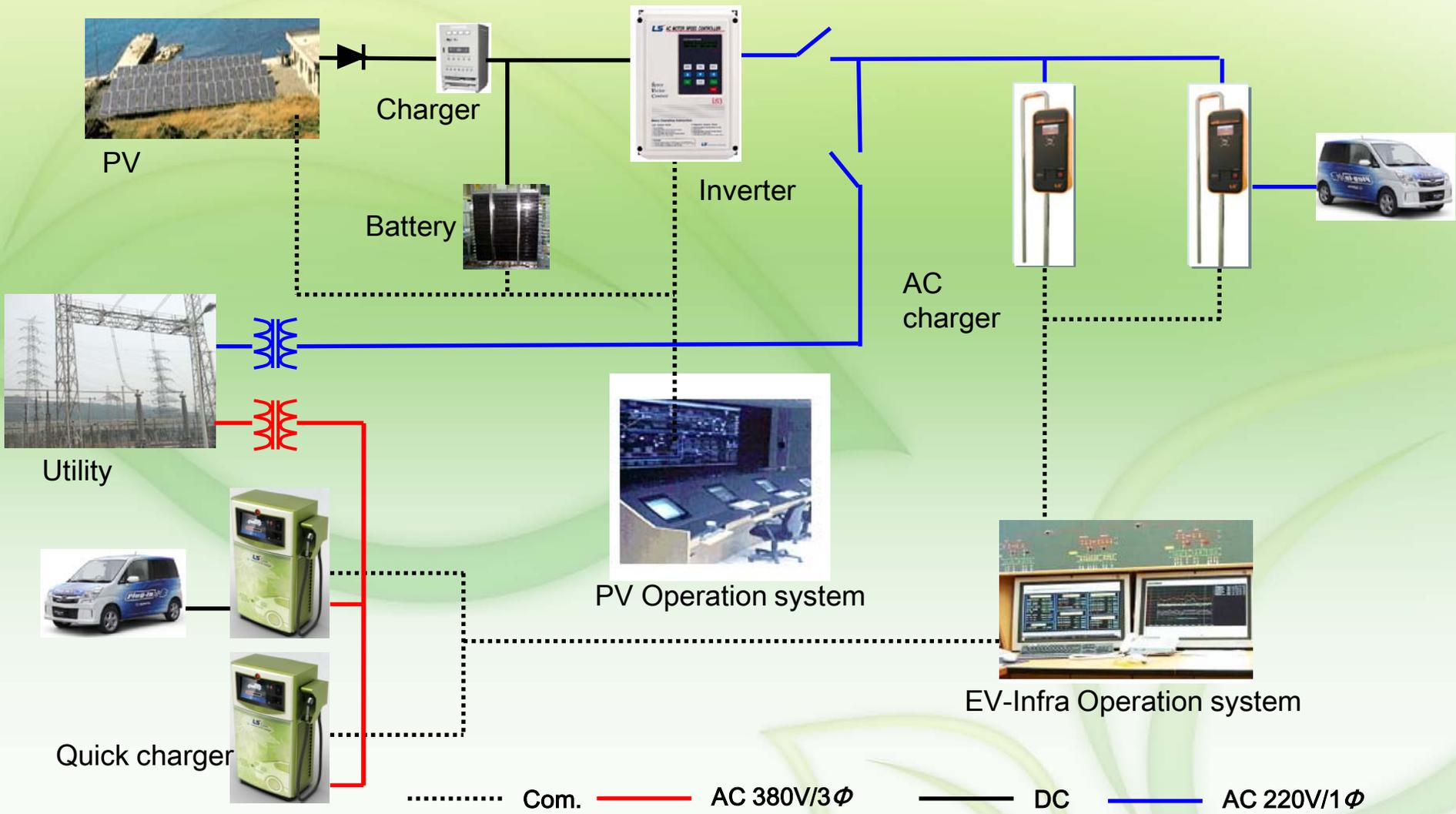
- ⊙ LSIS is the first company that built up the EV-charging infra. in the KOREA (for the Korea Environment Corporation).
- ⊙ KECO(Korea Environment Corporation; Agent of ME) builds up some demonstration sites for the PV integrated system(charging infra + solar power systems) with LSIS.





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

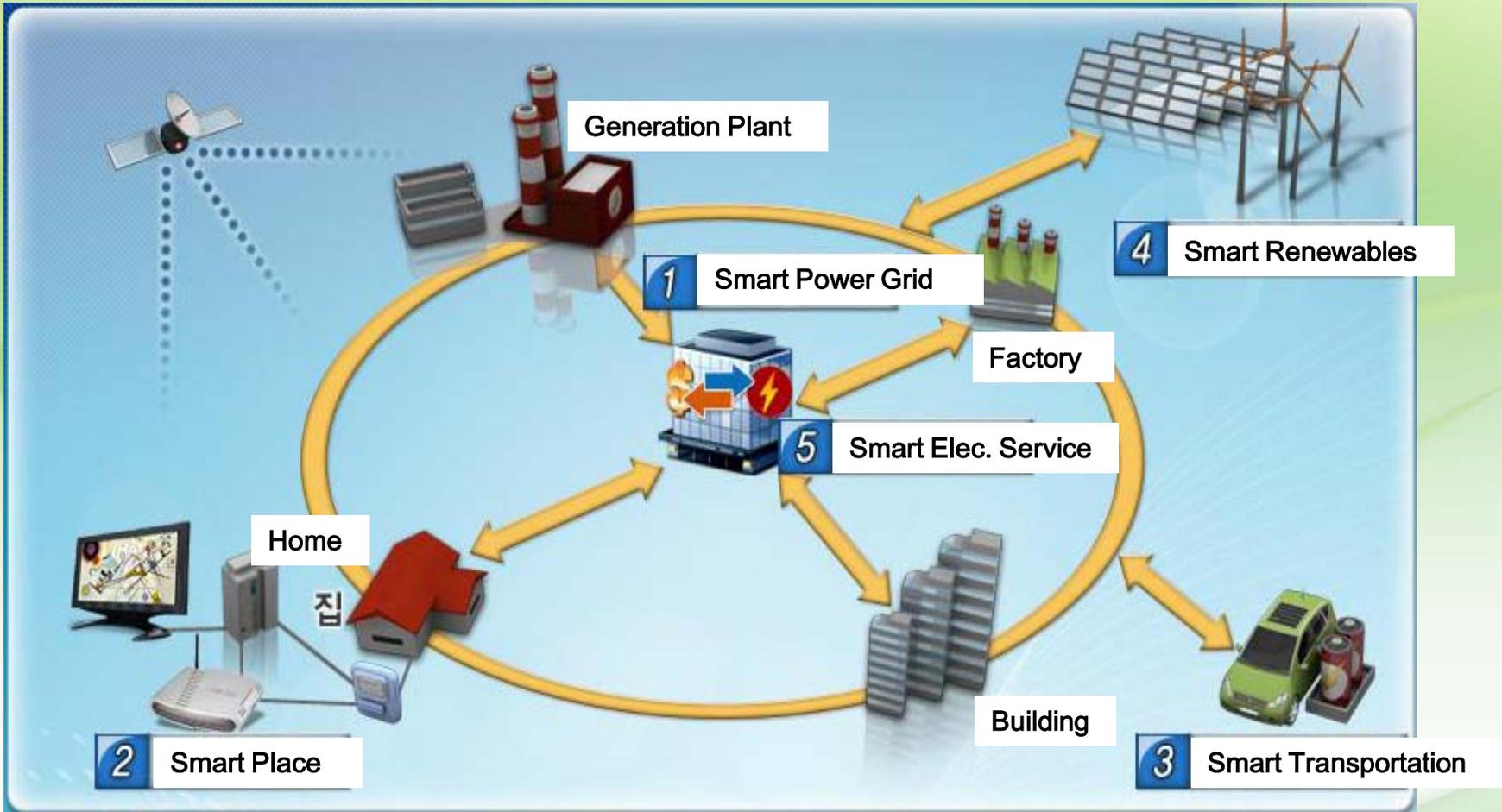


Solar panel



2. The Demonstration Site of Jeju Island

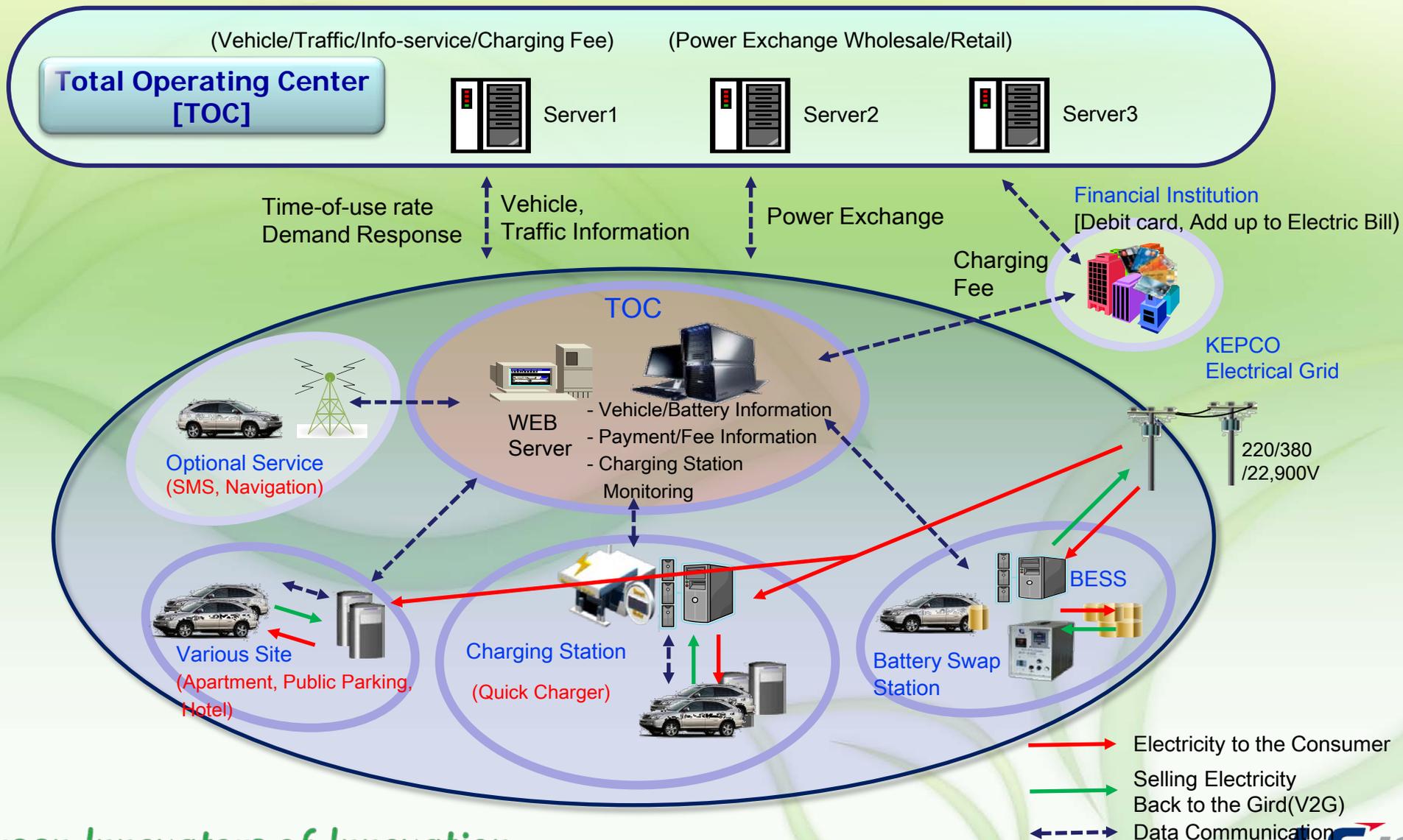
- © The Smart Grid Test Area in Jeju Island consists of 5 categories including EV Charging Infrastructure.





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[%]



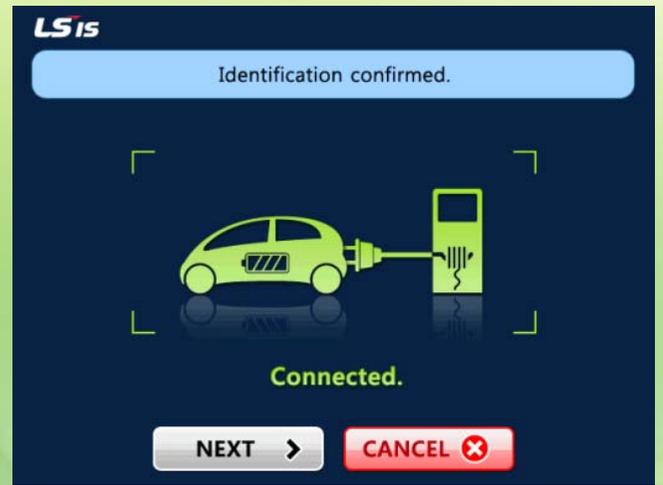


4. Charging Stand of LSIS

⊙ 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

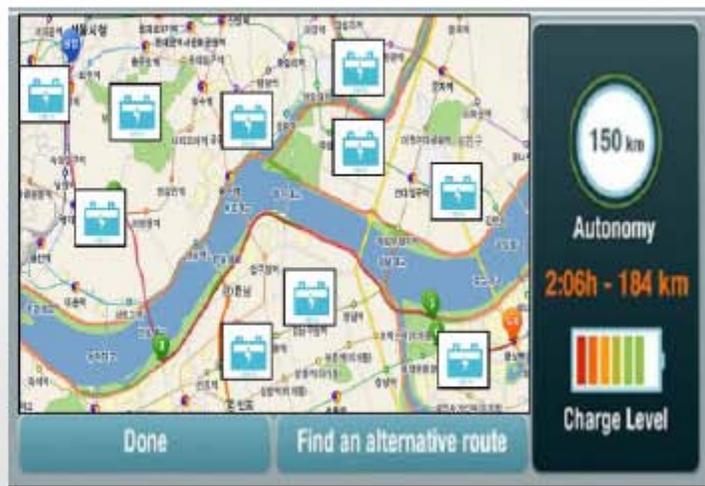




5. Suggested national policy

- ◉ 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

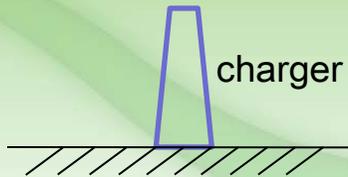


Fig. (a)

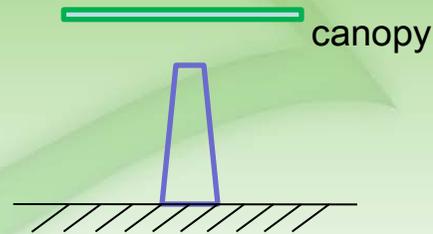


Fig. (b)

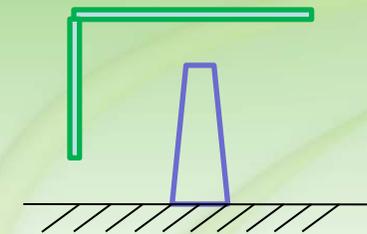


Fig. (c)

⊙ 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)

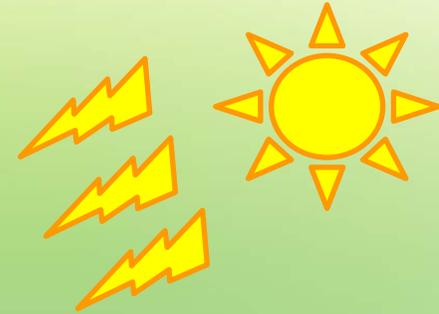
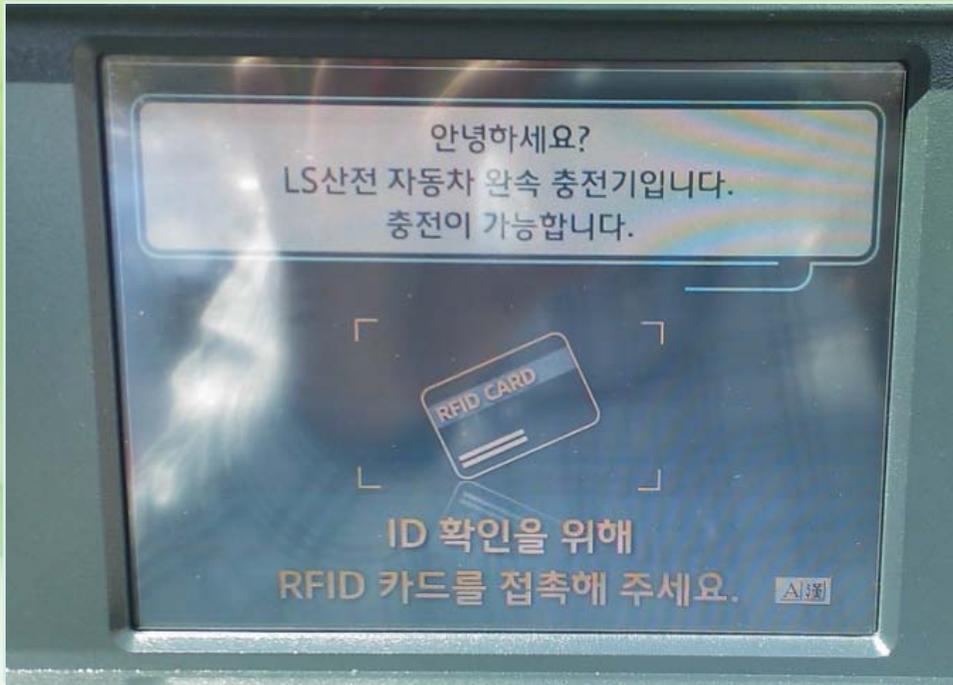


- ⊙ Smart grid test area(Jeju island) has type “C” connector.
(Cable is always attached to main body).
- ⊙ In winter, hardness of cable is too rigid to handle by weak person(Lady, ...).



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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Green Innovators of Innovation