



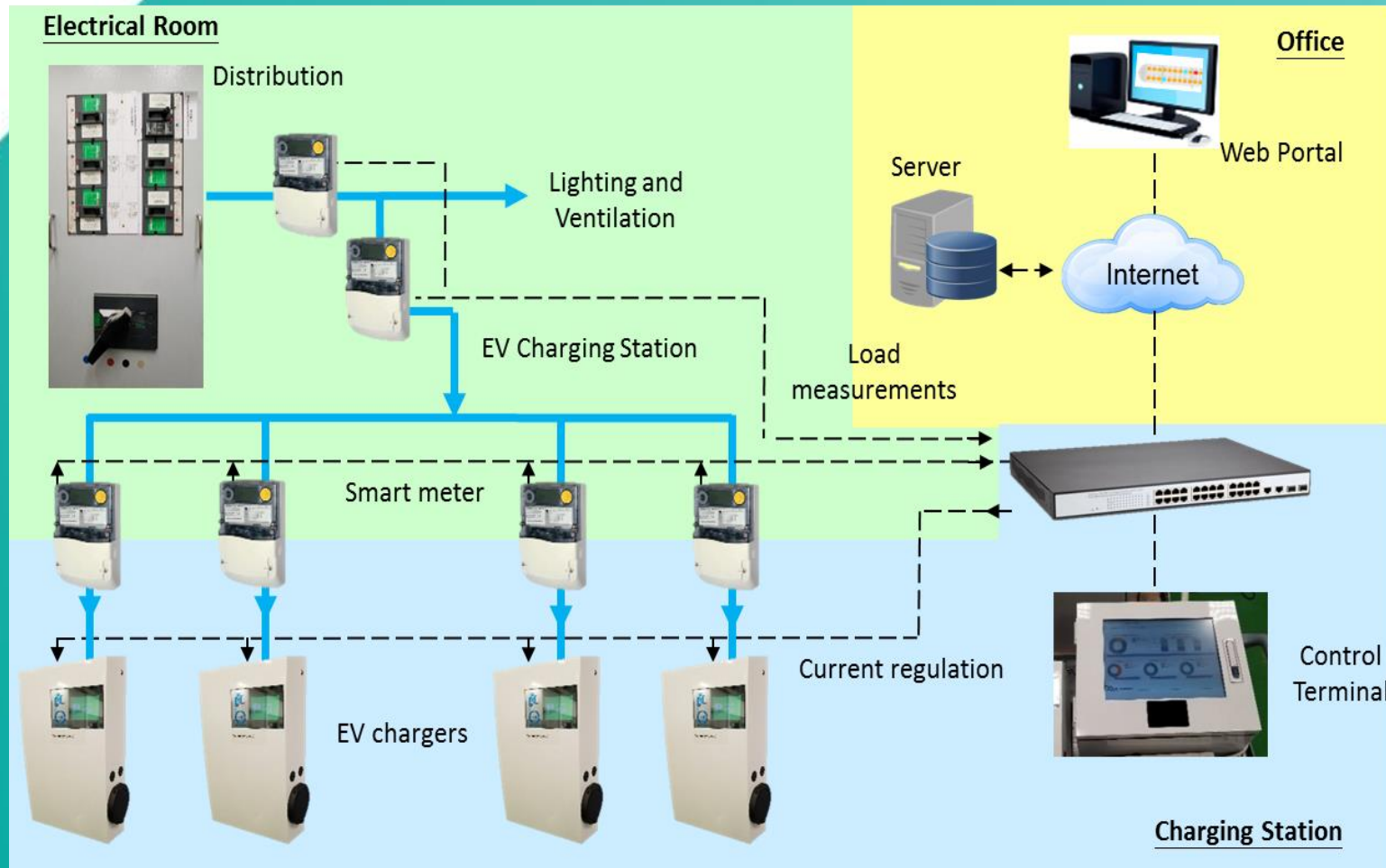
Smart EV Charging Station Load Management System

HKPC TechDive: Smart City – EV Technology
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Smart EV Charging Station Load Management System



- Monitors and analyse power usage of each Electric Vehicle (EV) charger in real-time connecting multiple parking spaces
- Rated power (100%) when there are only a few EVs
- When more EVs are connected, the system can reduce power output of some chargers (e.g. 50%) so as to allocate additional power to the just-arrived vehicles

Engineering Prototype – CLP Laguna Mall Carpark

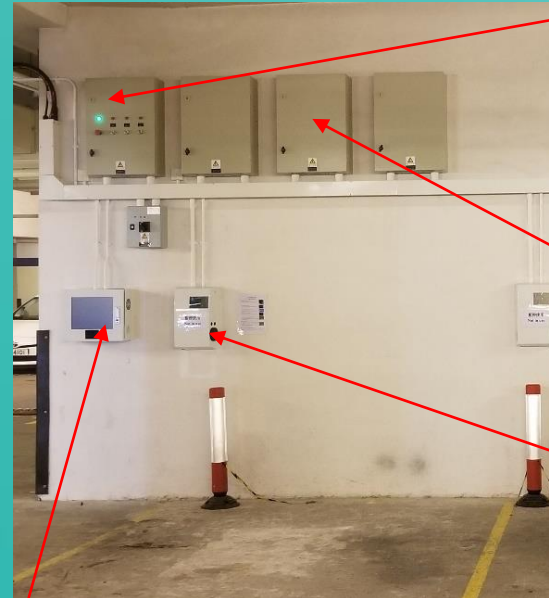
LG/F Meter Room



Monitor
Main
Supply
Current



B2/F 83-85 Parking Bays



Control Board



Meter Board



EV Charger



Control Terminal



3-phase EV charger x 3 units

Engineering Prototype – Housing Society HEYA Crystal Carpark

B1/F Meter Room



Monitor
Main Supply
Current

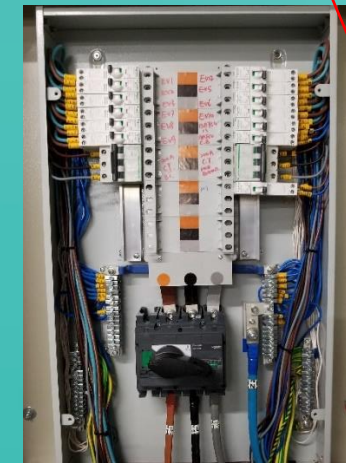
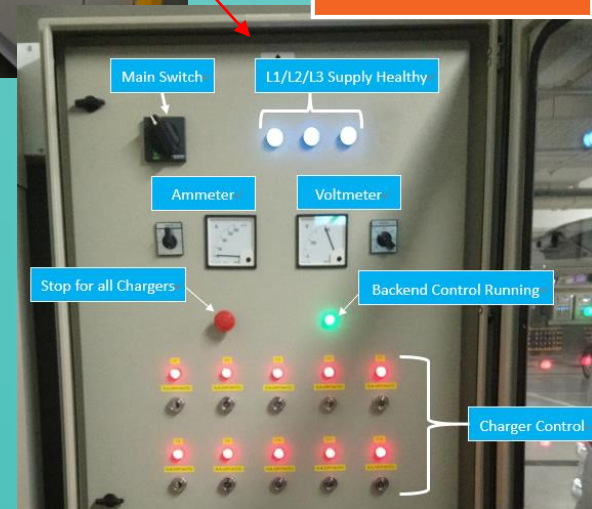
Control Terminal

Power Meter Board

B2/F



Control Board



Distribution Board

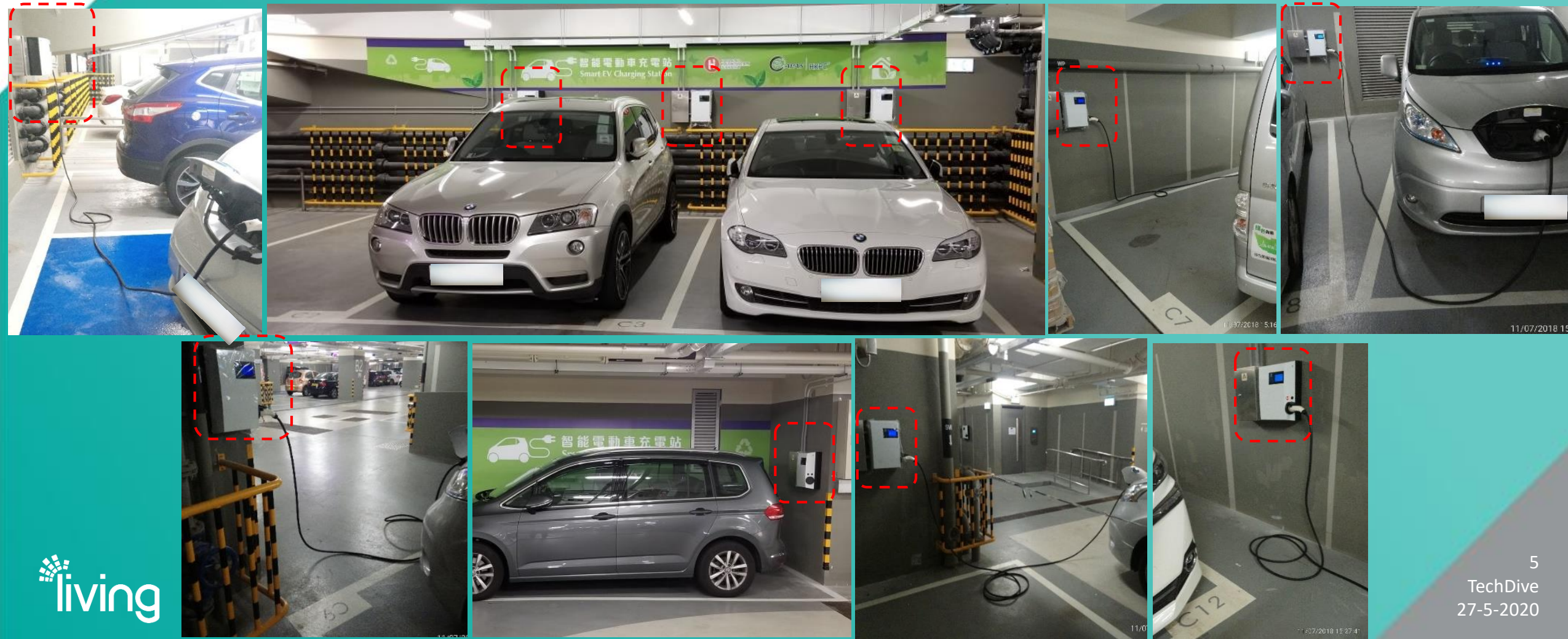


1-phase EV charger x 10 units

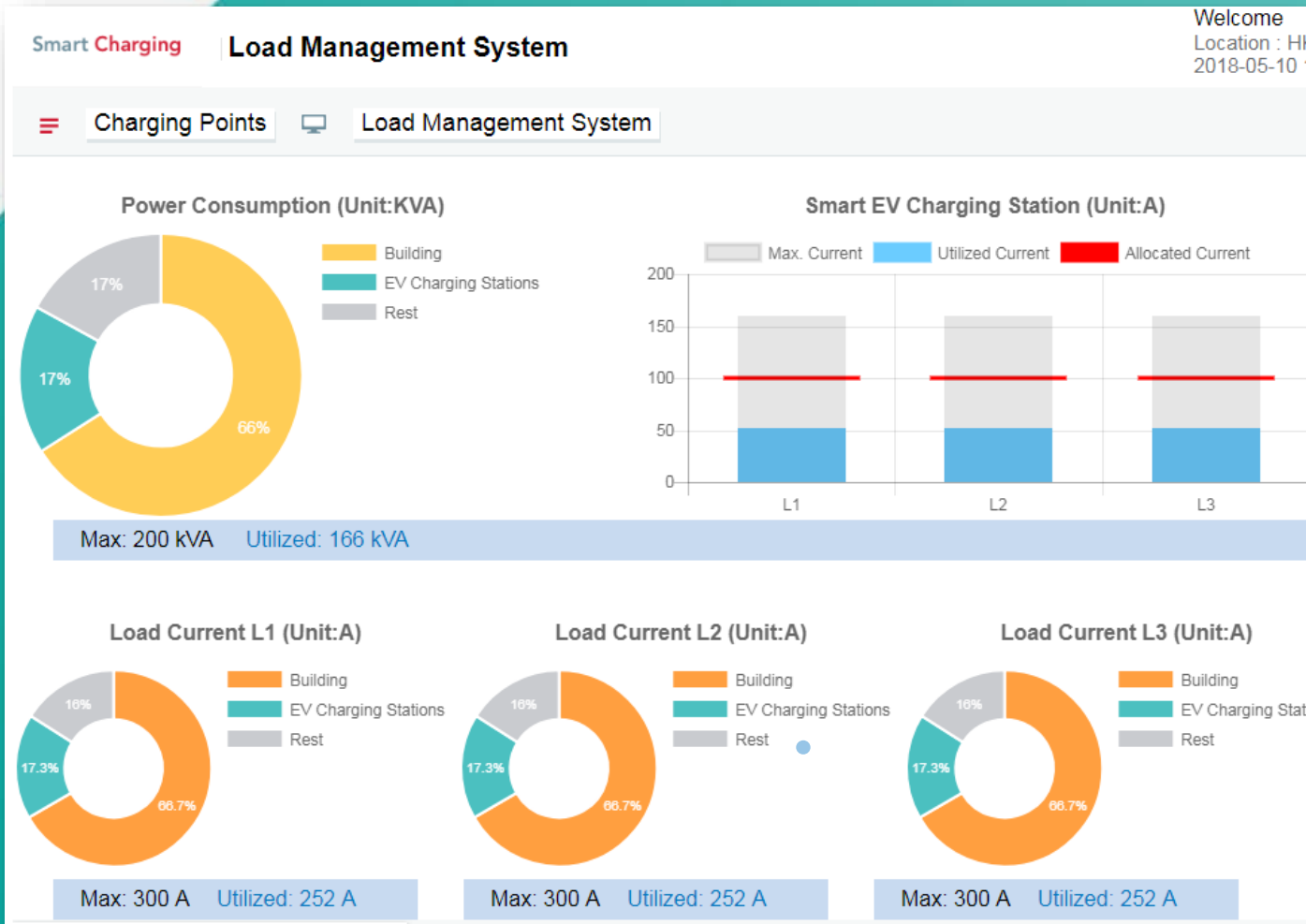
Engineering Prototype – Housing Society HEYA Crystal Carpark

B2/F parking bays

1-phase EV charger x 10 units



Local Controller – Load Management System



Object	Description
Supply	Sum of the electricity usage of the building plus EV charging station
Building	Electricity usage for the building, which is supplied by the same source as the EV charging station
EV Charging Station	Sum of the electricity usage of all EV chargers

Web Portal

SmartEV Station v0.31

Account Management
Site Management
Data Monitor
Historical Data
Report
User Profile

Site Control

Controller Status

Controller id	Last update	Build date
clp_lv_ctrl01	2018-10-13 10:43:27	2018-07-23 15:07
heya_crystal_c1	2018-10-26 10:23:33	2018-07-23 15:07

Site: HS_Heya_Crystal Controller: heya_crystal_c1 Snapshot Update Halt

devstruct heya_crystal_s1 Total current: 300 Total kVA: 198

Show entries

Parking Slot	Location	Meter id	Charger Status	Max. Current (A)	Now Current (A)	L1 Now (A)	L2 Now (A)	L3 Now (A)	Last meter update	Last charger update
heya_crystal_m1	Main Trunk	852020381	--	300	--	72.534	62.485	65.447	2018-10-24 16:50:30	--
852020382	Station	852020382	--	100.00	--	8.192	0.207	0.351	2018-10-24 16:50:30	--
hc1	C1	852020331	Available	30	24.00	22.718	0.000	0.000	2018-09-27 11:28:26	2018-10-25 12:30:48
hc2	C2	852020332	Available	30	27.00	25.915	0.000	0.000	2018-09-09 07:40:33	2018-10-25 12:30:48
hc3	C3	852020333	Available	30	30.00	15.902	0.000	0.000	2018-09-27 16:19:20	2018-10-25 12:30:48
hc4	C4	852020334	Available	30	30.00	28.763	0.000	0.000	2018-10-02 12:17:03	2018-10-25 12:30:48

Real-time monitoring and data logging

Automatic e-mail notification

All Unread

Search All Mail Items (Ctrl+E)

FROM SUBJECT RECEIVED SIZE

▲ Date: Today

evserver@hkpc.org	Info: EVController is connected:clp_lv_ctrl01	18/4/2018 (週三) 10:...	43 KB
evserver@hkpc.org	Warn: EVController is disconnected:clp_lv_ctrl01	18/4/2018 (週三) 10:...	43 KB
evserver@hkpc.org	Info: EVController is connected:clp_lv_ctrl01	18/4/2018 (週三) 2:15	43 KB
evserver@hkpc.org	Warn: EVController is disconnected:clp_lv_ctrl01	18/4/2018 (週三) 2:13	43 KB

▲ Date: Yesterday

evserver@hkpc.org	Info: EVController is connected:clp_lv_ctrl01	17/4/2018 (週二) 19:...	43 KB
evserver@hkpc.org	Warn: EVController is disconnected:clp_lv_ctrl01	17/4/2018 (週二) 19:...	43 KB
evserver@hkpc.org	Info: EVController is connected:clp_lv_ctrl01	17/4/2018 (週二) 10:...	43 KB
evserver@hkpc.org	Info: Central Server is started	17/4/2018 (週二) 10:...	43 KB

▲ Date: Monday

evserver@hkpc.org	Info: EVController is connected:clp_lv_ctrl01	16/4/2018 (週一) 23:...	43 KB
evserver@hkpc.org	Warn: EVController is disconnected:clp_lv_ctrl01	16/4/2018 (週一) 23:...	43 KB
evserver@hkpc.org	Info: EVController is connected:clp_lv_ctrl01	16/4/2018 (週一) 18:...	43 KB
evserver@hkpc.org	Warn: EVController is disconnected:clp_lv_ctrl01	16/4/2018 (週一) 17:...	43 KB
evserver@hkpc.org	Info: EVController is connected:clp_lv_ctrl01	16/4/2018 (週一) 8:19	43 KB
evserver@hkpc.org	Warn: EVController is disconnected:clp_lv_ctrl01	16/4/2018 (週一) 8:17	43 KB

▲ Date: Sunday

evserver@hkpc.org	Info: EVController is connected:clp_lv_ctrl01	15/4/2018 (週日) 18:...	43 KB
evserver@hkpc.org	Warn: EVController is disconnected:clp_lv_ctrl01	15/4/2018 (週日) 18:...	43 KB

Innovation and Creativity

More medium chargers to be installed in existing (old) buildings with limited spare power capacity

Fully utilise the building's power capacity for EV charging station

Relieve the concerns from Landlord / Incorporated Owner / Management Office of erecting medium chargers in larger scale

A technology-wise and long-term solution to the industry in supporting the Government policy

Smart power management and IoT elements of the System can leverage smart grid to make Hong Kong an Energy Smart City



Benefits and Impact

Real-time monitor of the power usage of EV chargers

Fully utilise carpark electricity capacity for EV charging station

More medium chargers to be installed in existing buildings with limited spare electricity capacity



Market Potentials

Solution for existing buildings without limited electric load capacity to support a larger-scale installation of medium charging facilities

Reduce the need of extra space and costs associated with updating and retrofitting the power distribution system may be prohibitive, e.g. add extra power transformer

Data monitoring of EV Charging Station e.g. charging behavior, load profile, utilization rate, impact to grid

Prepare for future Smart Grid development





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