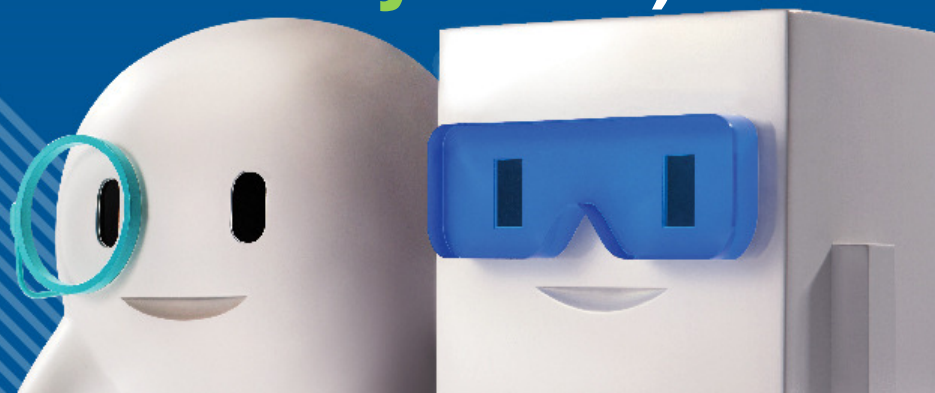




Smart EV Charging Station Energy Management System (Power Load Management System)

For 29 Jun 2015





Contents

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 2. Medium Charging Development
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- 



Neutral and non-commercial

- Hong Kong Productivity Council (HKPC) is a statutory body with a public mission to support HK Industry
- Non-commercial and non-profit making entity
- Supported by fee income from services & government subventions

Strong connection with Hong Kong Industry

- Solid track record of project management and implementation, especially in product R&D and commercialization
- Wide and close industrial network through its 47 years of operation

Strong and diversified expertise

- 600 professional staff with a wide variety of expertise in serving various industry sectors
- In electronics, a team of 60 consultants with strong expertise in electronics, Information Technology, wireless and radio frequency communications, EMC Testing etc

Solutions for Government Bodies and NGOs'



Advanced Driving Assistance System 2010 – 2014

- 90% funded by ITC
- To enhance driving safety-
- Image processing Technology
- 18 gov. fleet vehicles participated in the trial

創新科技署
Innovation and
Technology Commission



水務署

Next Generation e-Channel 2013 – 2014

- 100% funded by ImmD
- Industrial design for next gen. e-Channel
- Better aesthetics, ergonomic, user experience, and operation efficiency



Refuse Collection Vehicle (RCV) Retrofit T&C 2013 – 2015

- 100% funded by EMSD
- To enhance the environmental performance of RCVs during waste transportation
- Pilot Scheme + Full Scheme
- Approved trucks: 212



機電工程署
EMSD



Research of Biodiesel on GSE Application 2014 – 2015

- 100% funded by ITC
- To evaluate results of using Biodiesel on GSEs
- Test 59 GSEs for emission
- Test 3 GSEs for engine durability

創新科技署
Innovation and
Technology Commission

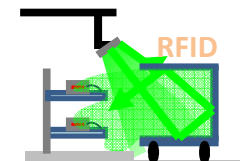


Supported by:



Development of RFID Belt-Read Solution 2014 – 2016

- To resolve RFID related problems for Automated Baggage Reconciliation System (ABRS)
- Belt read reduction with Intelligent RFID Activity Confiner (IRAC)



Medium Charging Development – 1/2

2012

EV-MegaNet Charging Network

- A charging network developed for local power company
- Compatible with 3 international charging standards (BS, SAE, IEC)
- Highest power AC charging station (3ph, 22kW)

HKPC[®] CLP 中電



香港房屋委員會
Hong Kong Housing Authority



彩德村(九龍灣)-2012年6月啟用



葵涌村(葵涌)-2012年11月啟用



HKPC[®]

Medium Charging Development – 2/2

2013

Charging Pro

- Low-cost EV charging station, economic solution for large scale adoption
- Support business upgrading of local SME to successfully commercialize EV charging station
- Highly expandable, can adopt networked management system and intelligent load regulation



新鴻基地產
Sun Hong Kai Properties



跑馬地曉廬



2014

100 Dual-Standard Medium Chargers for Policy Address 2014

- Extend the core technology of Charging Pro, develop a dual-standard medium charger for another local SME
- Total 100 medium chargers installed in 16 Government carparks



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環境保護署

Environmental Protection Department

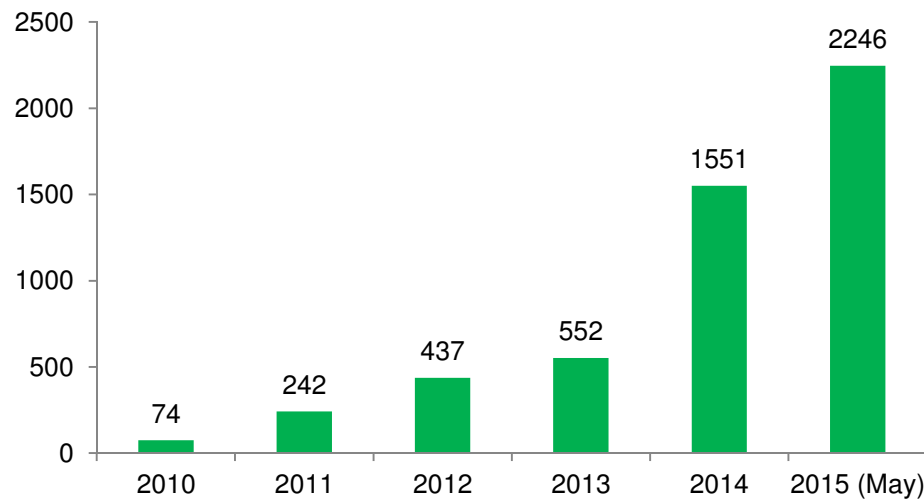


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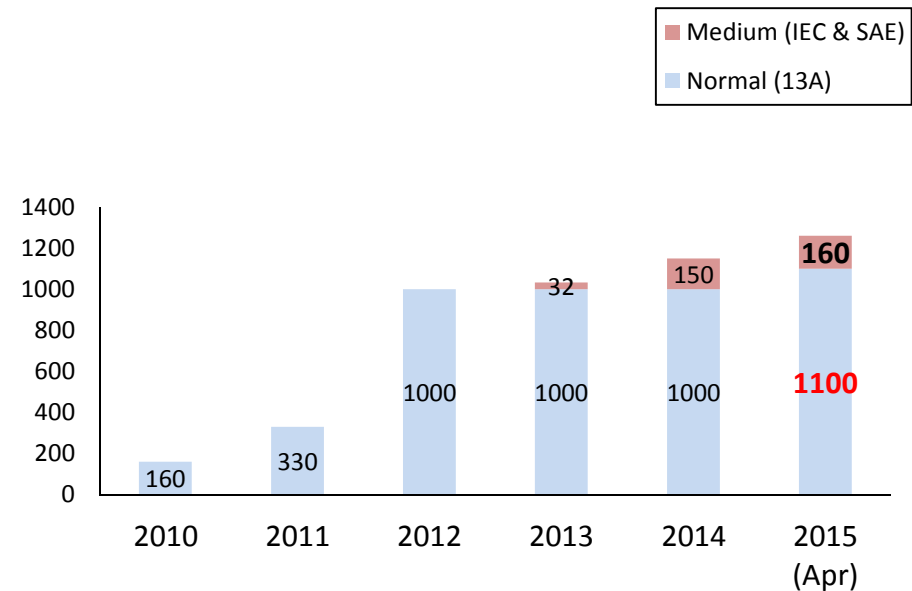
EV & Charging Facilities in HK

- Development of Charging Facilities cannot keep pace with the rapid growth of EVs

No. of EVs in HK



No. of Public Charging Points in HK



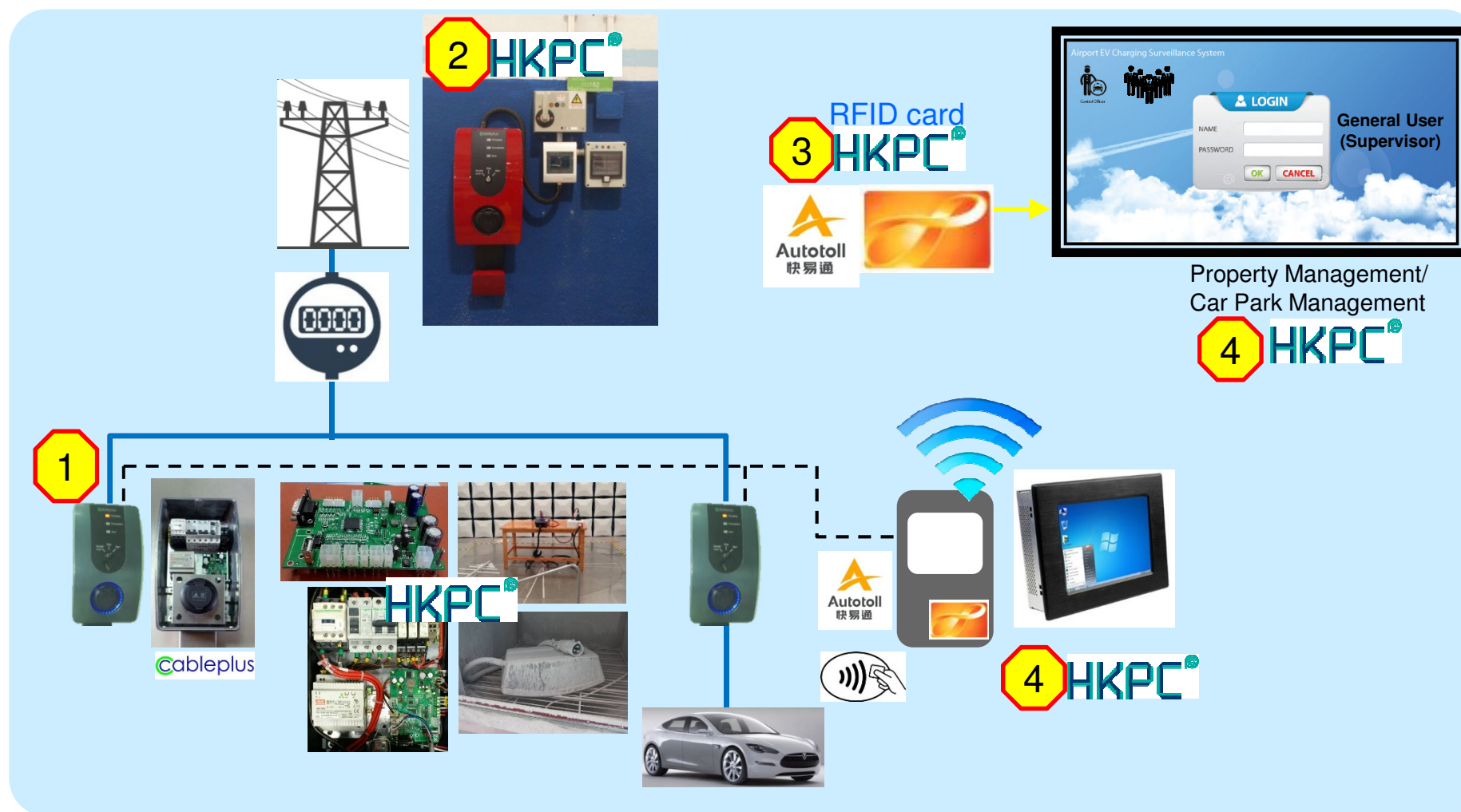
13A socket
(~2.2kW)



Medium charger
(7-42kW)



Operation Model for providing EV Charging Services



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Solution

1. EV Charging Tech.
2. Power Load Mgt.
3. E-Payment Sys.
4. Operation Mgt.

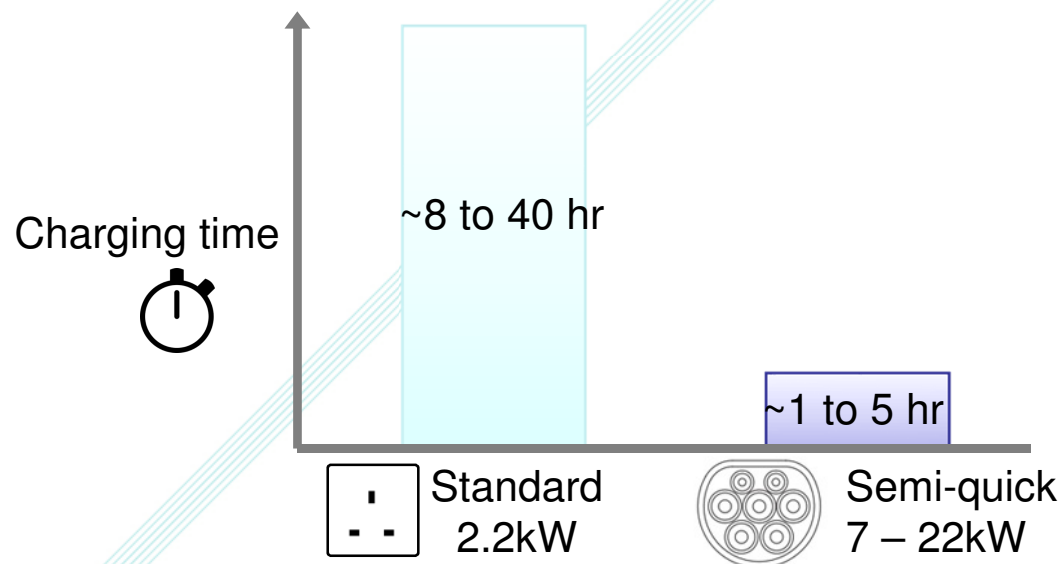
Background

Medium Charger greatly reduces the EV charging time

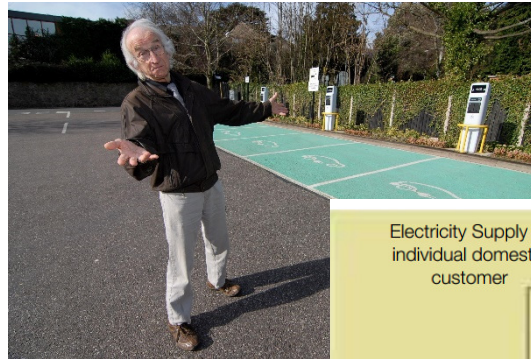
Problem: - Few charging stations in HK provide medium charging services

Barriers:

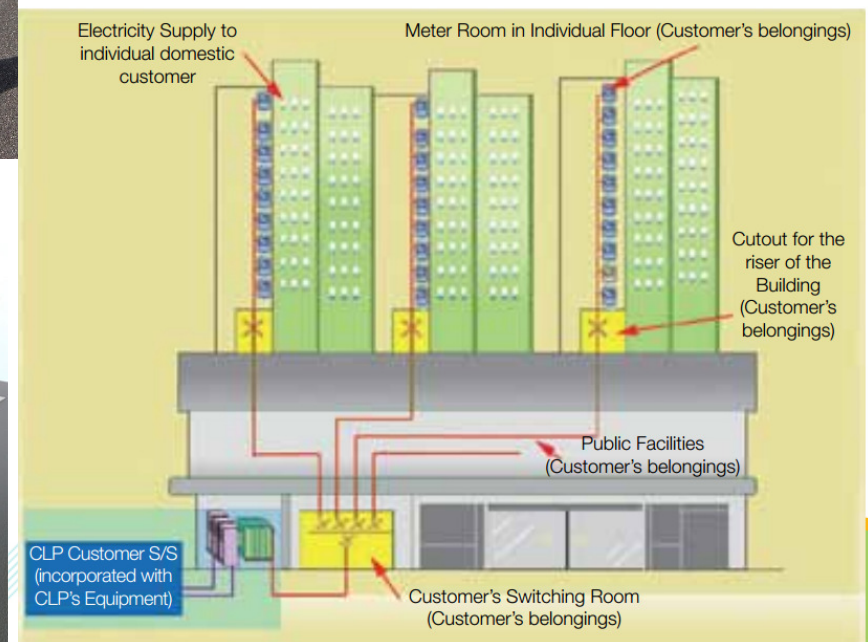
- **Loading limitations** of the power supply in existing car parks
- **Lack of space for extra transformer** to support more chargers
- The **costs** associated with upgrading the power distribution



Let's Check up on the Charging Scenario.....

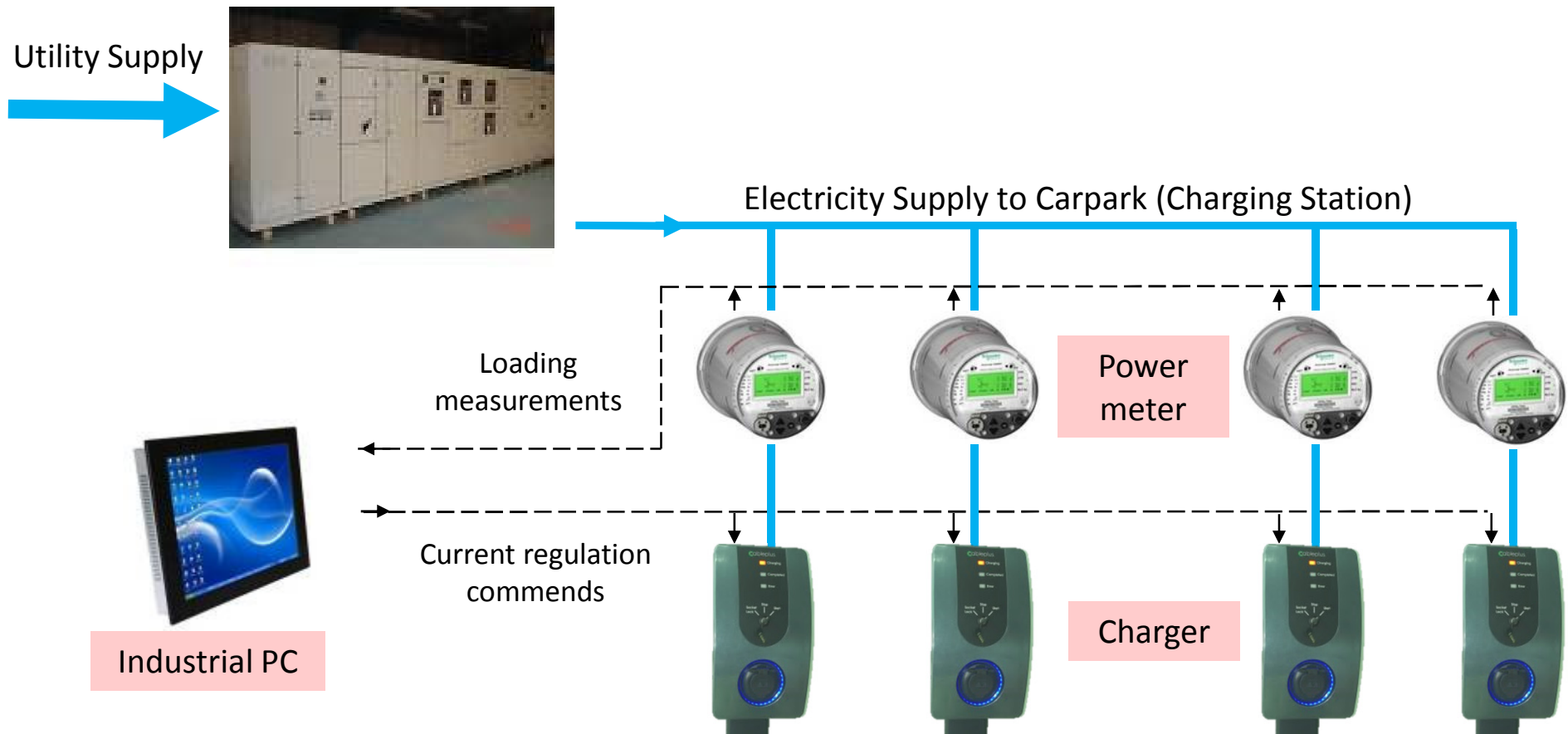


1. Not fully utilized
 2. Misused
 3. Keep occupied
- Therefore, it is suggested to...
1. Increase charging bays



Solution: EV Charging Station Energy Management System

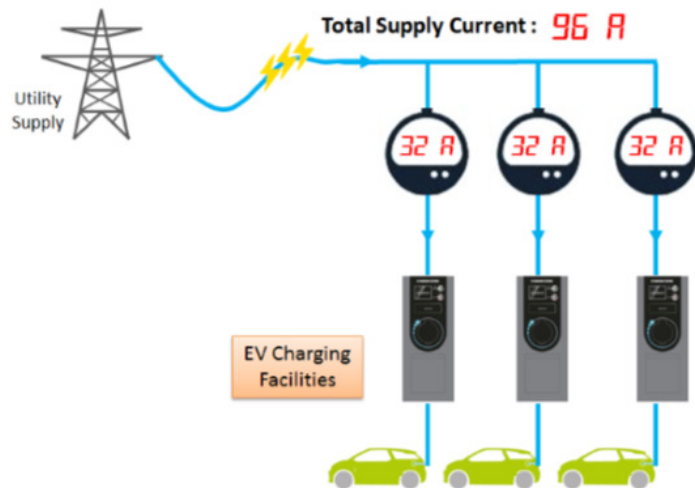
Core technologies: - EV Charging Load Management



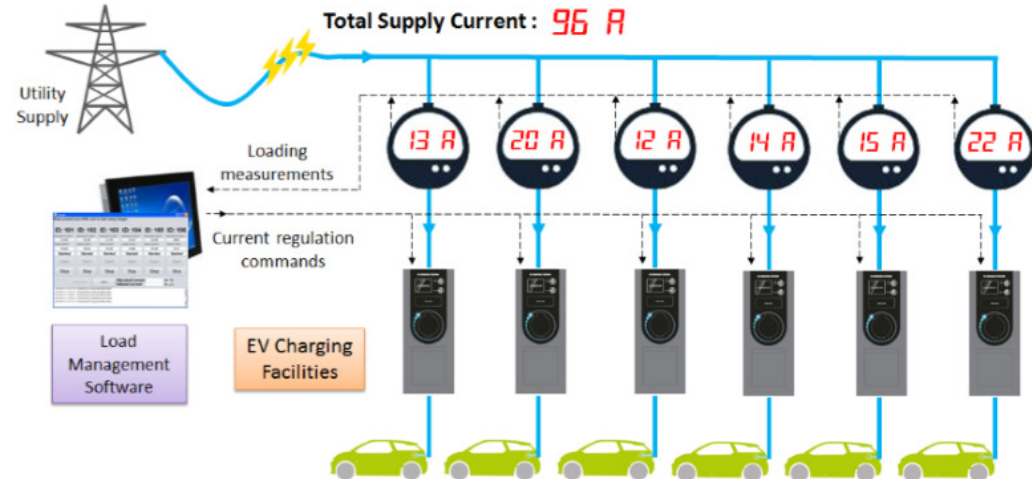
EV Charging Load Management

- Regulate charging current of EV charging facilities based on the overall demand
- HKPC owned technology with IP (Patent Number: HK1197157, HK1197158)

NO LMS: limited number of EV charging bays

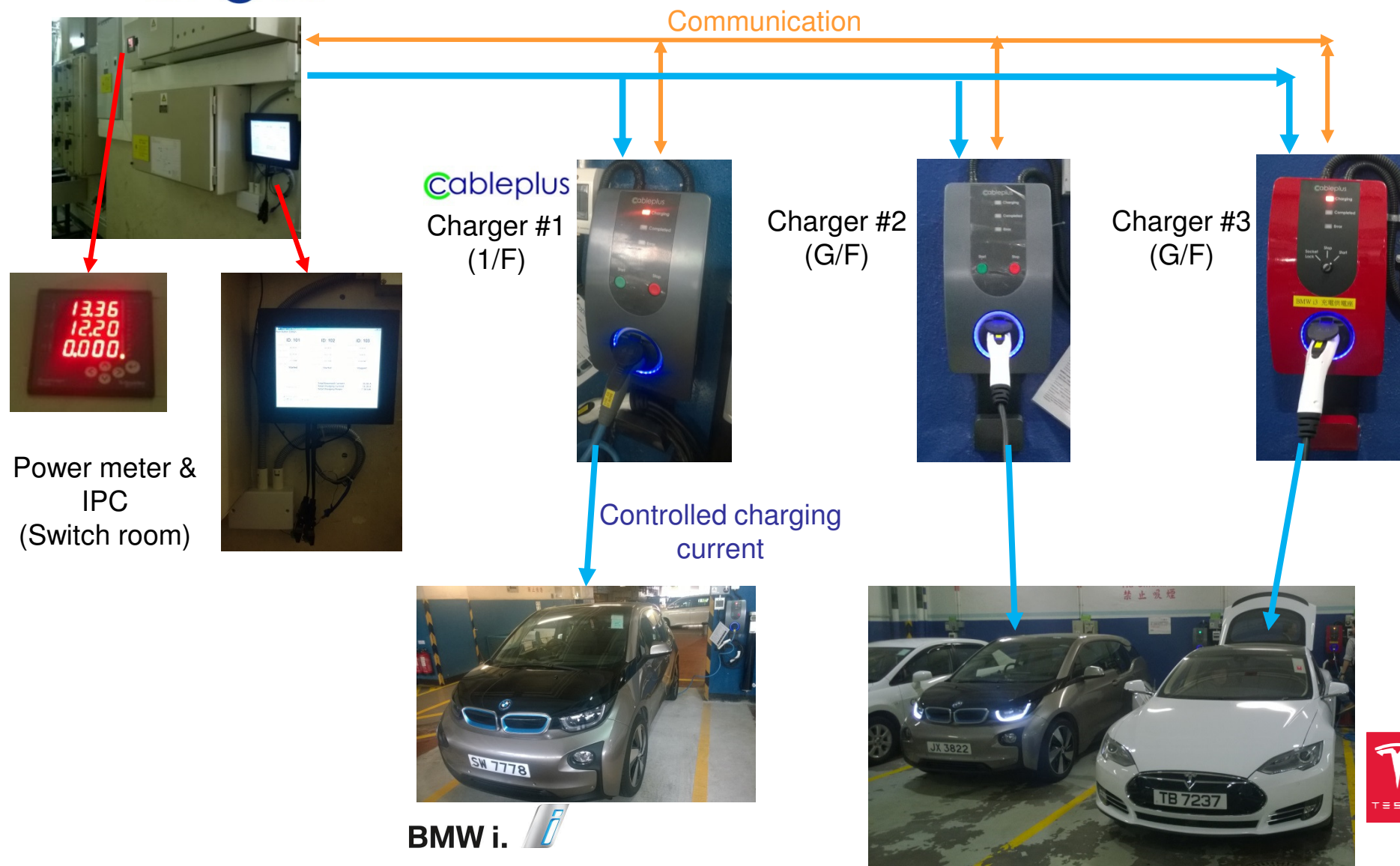


With LMS, double the number of EV charging bays



EV Charging Load Management – Field Test at CLP Depot

HKPC[®] CLP 中電



EV Charging Load Management - Field Test at CLP Depot

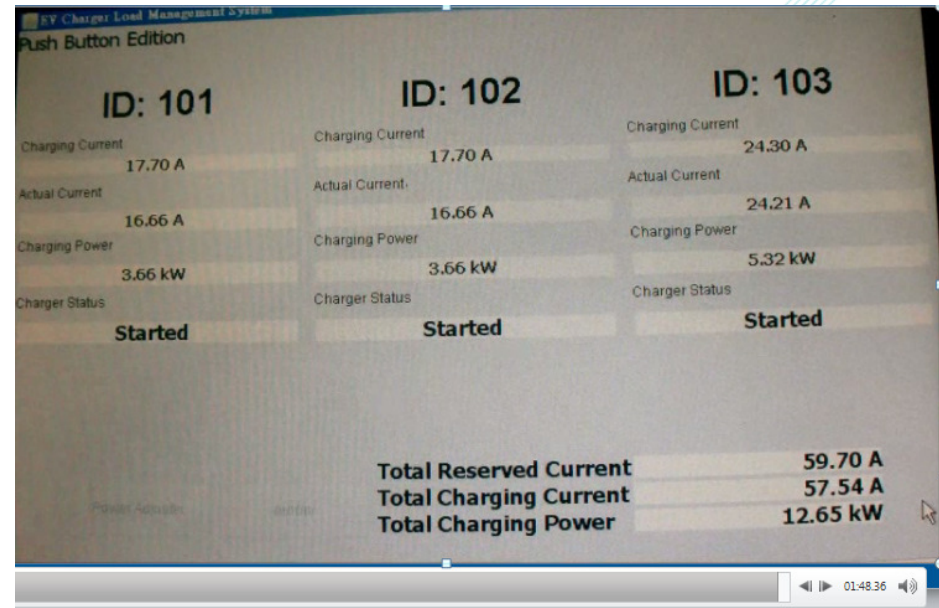
CLP site: max. 60A for 3 chargers

Only 2 EVs

	Total	# 101 (BMW)	# 102 (BMW)	# 103 (Tesla)
Allocated	59.6 A	32 A	27.6 A	0 A
Actual	37.6 A	19.51 A	18.10 A	0 A

3rd EV arrives

	Total	# 101 (BMW)	# 102 (BMW)	# 103 (Tesla)
Allocated	59.7 A	17.7 A	17.7 A	24.3 A
Actual	57.63 A	16.75 A	16.65 A	24.22 A





Benefits of Smart Energy Management System

- More charging bays to satisfy more users
 - Less operation management effort since no blocking or reservation
 - Limited investment to accommodate extra power
 - Maximize power utilization
- 