

A Novel Energy-free and Environment-friendly Passive Radiative Cooling Paint for Building Energy Saving and Decarbonisation



香港城市大學
City University of Hong Kong
能源及環境學院
SCHOOL OF ENERGY
AND ENVIRONMENT

Indoor Air Temperature Reduction > 5 °C

Cooling power > 80 W/m²

Energy Saving > 10%

CO₂ Emission Reduction ~ 50,000 Tons (≈ 350,000 Trees/year)

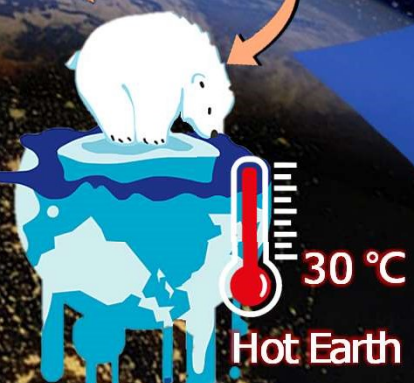


Refrigerant-free
Energy-free

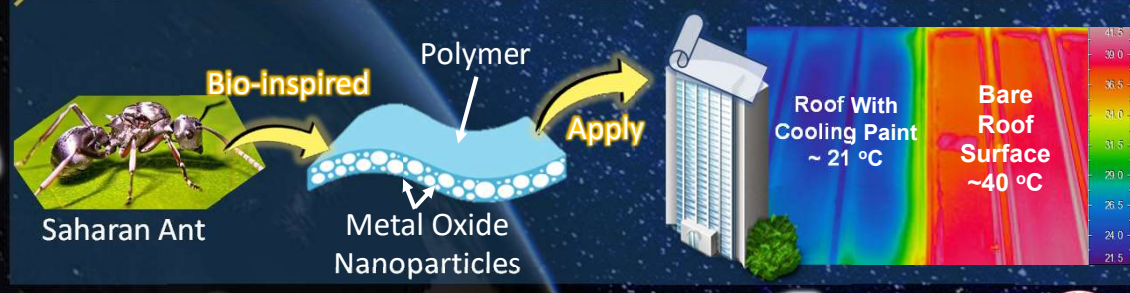
High Solar Reflection

High MIR Emission

- Gold Medal Inventions Geneva
- 創客中國 2021 國際中小企業創新創業大賽 - 香港分站賽 SME INNOVATION AND ENTREPRENEURSHIP GLOBAL CONTEST HONG KONG CHAPTER **Champion**
- SPONSORED BY CityU HK TECH 300
- IDEATION HKSTP
- CLIMATE ACTION Winner RECOGNITION SCHEME
- YPEC 2021 EXHIBITION & COMPETITION 1ST RUNNER UP
- HKIE THE HONG KONG INSTITUTION OF ENGINEERS Environmental Paper Award - **Champion**
- 第7屆 Second Price 香港大學生創新及創業大賽 The 7th Hong Kong University Student Innovation and Entrepreneurship Competition
- 慳神創科大比拼 2018 Energy Saving Championship Scheme Best Innovation Award Hanson I&T Outstanding Award



Solution





無電製冷技術
Electricity-free
Cooling Technology

Cooling technology
applied in Central Market

September 2022



Saving > 120
kWh / (m²·year)



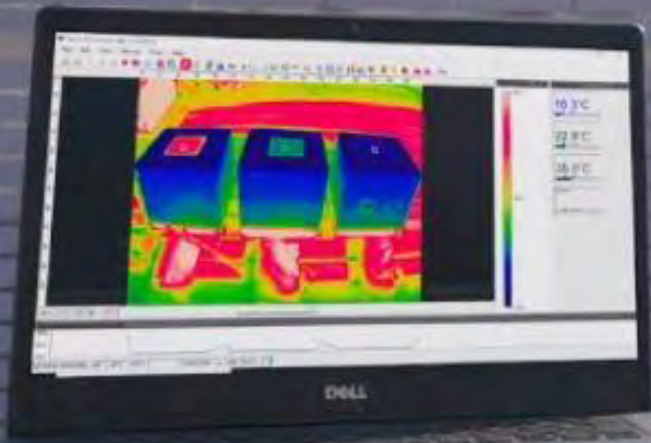
Reducing > 70
kg CO₂ / (m²·year)



< 1 Year
Expected Payback
Period of *iPaint*



> 5 Years
Estimated Life
Span of *iPaint*



34.9°C

No
Paint

22.9°C

Normal
Paint

15.0°C

Passive Radiative
Cooling Paint

Thanks to our unique and patented material composition,
Grâce à notre composition unique et brevetée des matériaux,



国家知识产权局

GAI21CN6459

100033

北京市金融街35号国际企业大厦A座16层
北京三友知识产权代理有限公司 姚亮(010-62300800), 韩晋(010-62300800)

发文日:

2021年12月24日



申请号或专利号: 202111591407.2

发文序号: 2021122400799220

专利申请受理通知书

根据专利法第28条及其实施细则第38条、第39条的规定, 申请人提出的专利申请已由国家知识产权局受理。现将确定的申请

申请号: 2021年
申请人: 香港城市
发明创造名称: 看
经核实, 国家知识
说明书摘要 每份
经证明的在先申请
说明书 每份页数
在先申请文件副本
说明书附图 每份
权利要求书 每份
发明专利请求书
专利代理委托书

知識產權專利註冊處
Patents Registry
Intellectual Property Department



香港特別行政區政府
The Government of the Hong Kong
Special Administrative Region

批予短期專利證明書

《專利條例》(第514章)

CERTIFICATE OF

Receipt No. 收據編號: N0000200299



Patents Registry
Intellectual Property Department
The Government of the Hong Kong Special Administrative Region

香港特別行政區政府

知識產權署

專利註冊處

The Registrar of Patents acknowledges receipt of the following Form P6/P6A-
專利註冊處處長收到下列表格第 P6/P6A 號: -

Date of receipt 收到日期: 24-12-2020
(DD-MM-YYYY):

Amount paid 已付金額 Note 2: HK\$613.00

Payment method 繳費方式: Deposit Account 繳費戶口

Application no. 申請號:	SF-HKS01056
Submission ID 遞交編號:	32020022670.4
Submission ID 遞交編號:	S00972874

Attachments 附件	No. of attachments 附件的數目
Specification 說明書	2
Abstract (in both English and Chinese) 摘要(中文本及英文本)	2
Search report and/or translation of the search report 查檢報告及/或查檢報告譯本	0

專利所有人姓名或名稱及地址:
City University of Hong Kong
Tat Chee Avenue, Kowloon
HONG KONG

茲證明下述短期專利在今日批
I hereby certify that a short-term
專利編號 Patent No.: HK30045

發明名稱 Title of Invention:
一種多層的顆粒嵌入式被動輻
A MULTI-LAYER, PARTICLE

短期專利有效期 (在符合規期的
由 07.07.2021 起計 8 年
Eight years commencing on 07.07.

提示:
1. 申請人收到專利申
請更正。
2. 申請人收到專利申
3. 國家知識產權局收

審查員: 自動

200101 紙件申請, 1
2019.11 電子申請, 1
文件視為未

Granted Patent
中國內地及香港
專利認證



Test Report

Page 1 of 6

Date: 2022-04-25
No.: HT22020045

Applicant: I2 Cool Limited
八龍佐敦文咸街
文昌樓6樓41室
Attn.: Iris ZHU

Description of Samples: One (1) group of submitted sample said to be:
High-Reflectivity coating paint
Country of origin: China

Date Samples Received: 2022-02-16

Date Tested: 2022-02-16 to 2022-03-18

Investigation Requested: Selected test(s) as detailed herein.

检测报告/Test Report

报告编号/Report No.: WP-22066167-JC-01

样品来源/Sample Origin: 客户送样/ Customer Sample Delivery

创冷科技有限公司
创冷科技(香港)有限公司
名称/Client: I2Cool Limite

香港特别行政区九龙城区达之路 83 号
83 Tat Chee Ave. Kowloon Tong, Hong Kong

地址/Address: Kong



CHENG Man-yiu, David, Authorized Signatory

The Hong Kong Standards and Testing Centre Limited



上海微谱检测科技集团股份有限公司

结论 / Conclusion:

基于所送样品的指定部位进行的测试, 铅、镉、汞、六价铬、多溴联苯(PBBs)、多溴二苯醚(PBDEs)、邻苯二甲酸酯(如邻苯二甲酸二丁酯 (DBP)、邻苯二甲酸丁苄酯(BBP)、邻苯二甲酸二(2-乙基己基)酯(DEHP) 和邻苯二甲酸二异丁酯(DIBP)的测试结果符合欧盟 RoHS 指令 2011/65/EU 附录 II 的修正指令(EU) 2015/863 的限值要求。

Based on the performed tests on selected part of submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ether (PBDEs), Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP), and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2011/65/EU, Annex II to Directive 2011/65/EU.

項目	檢測依據	結果
太陽光反射率 (250-2500nm)	GB/T 2680-2021 ASTM E1980-11(2019)	95.06%
中紅外 (8-13μm) 輻射率	GB/T 30127-2013 GB/T 30127-2013	95.2%
光澤度	ISO 2813:2014	83
太陽反射指數SRI	ASTM E1980-11(2019)	120
拉脫附著力測試	ASTM D4541-17	7 MPa
抗衝擊性測試	ISO 6272-2:2011	60 kg·cm



报告编号/Report No.: WP-22076087-JC-01CaEn 页码/Page(s): 4 / 6

检测项目/Test Items	单位/Unit	MDL	限值/Limit	序號/Seria No.
五溴二苯醚 Pentabromodiphenyl ether	mg/kg	5	-	N.D.
六溴二苯醚 Hexabromodiphenyl ether	mg/kg	5	-	N.D.
七溴二苯醚 Heptabromodiphenyl ether	mg/kg	5	-	N.D.
八溴二苯醚 Octabromodiphenyl ether	mg/kg	5	-	N.D.
九溴二苯醚 Nonabromodiphenyl ether	mg/kg	5	-	N.D.
十溴二苯醚 Decabromodiphenyl ether	mg/kg	5	-	N.D.
邻苯二甲酸二丁酯 (DBP) Dibutyl phthalate (DBP)	mg/kg	50	1000	N.D.
邻苯二甲酸丁苄酯 (BBP) Butyl benzyl phthalate (BBP)	mg/kg	50	1000	N.D.
邻苯二甲酸二(2-乙基己基)酯 (DEHP) Bis(2-ethylhexyl) phthalate (DEHP)	mg/kg	50	1000	N.D.
邻苯二甲酸二异丁酯 (DIBP) Diisobutyl Phthalate (DIBP)	mg/kg	50	1000	N.D.

结论 / Conclusion:
基于所送样品的指定部位进行的测试, 铅、镉、汞、六价铬、多溴联苯(PBBs)、多溴二苯醚(PBDEs)、邻苯二甲酸酯(如邻苯二甲酸二丁酯 (DBP)、邻苯二甲酸丁苄酯(BBP)、邻苯二甲酸二(2-乙基己基)酯(DEHP) 和邻苯二甲酸二异丁酯(DIBP)的测试结果符合欧盟 RoHS 指令 2011/65/EU 附录 II 的修正指令(EU) 2015/863 的限值要求。
Based on the performed tests on selected part of submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ether (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP), and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2011/65/EU, Annex II to Directive 2011/65/EU.

附录 4 项/ Halogen four
测试方法和检测仪器/Test Method and Apparatus:

检测项目 Test Items	检测方法 Test Method	检测仪器 Apparatus
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通過 RoHS (Restriction of Hazardous Substances) 有害物質測試, 符合歐盟標準, 安全無害

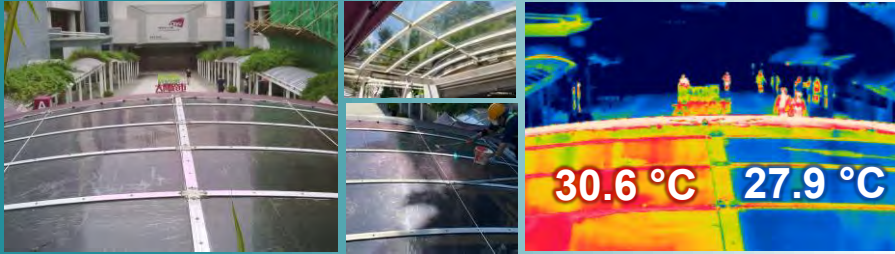
Patents in Hong Kong and Mainland China:

✓ HK30045313

✓ HKS01056

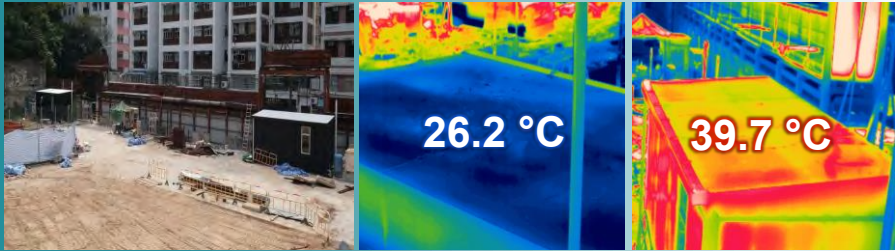
✓ GAI21CN6459

@CityU March. 2022




 香港城市大學
 City University of Hong Kong

@Mong Kok November. 2021




 恒基兆業地產有限公司
 HENDERSON LAND DEVELOPMENT COMPANY LIMITED

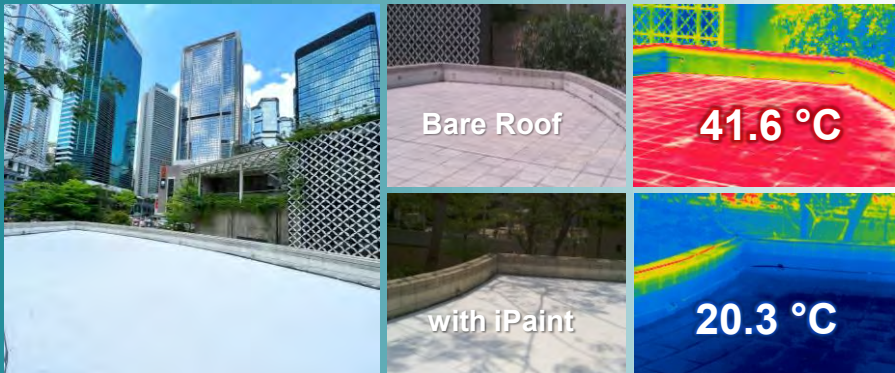
@Central January. 2022



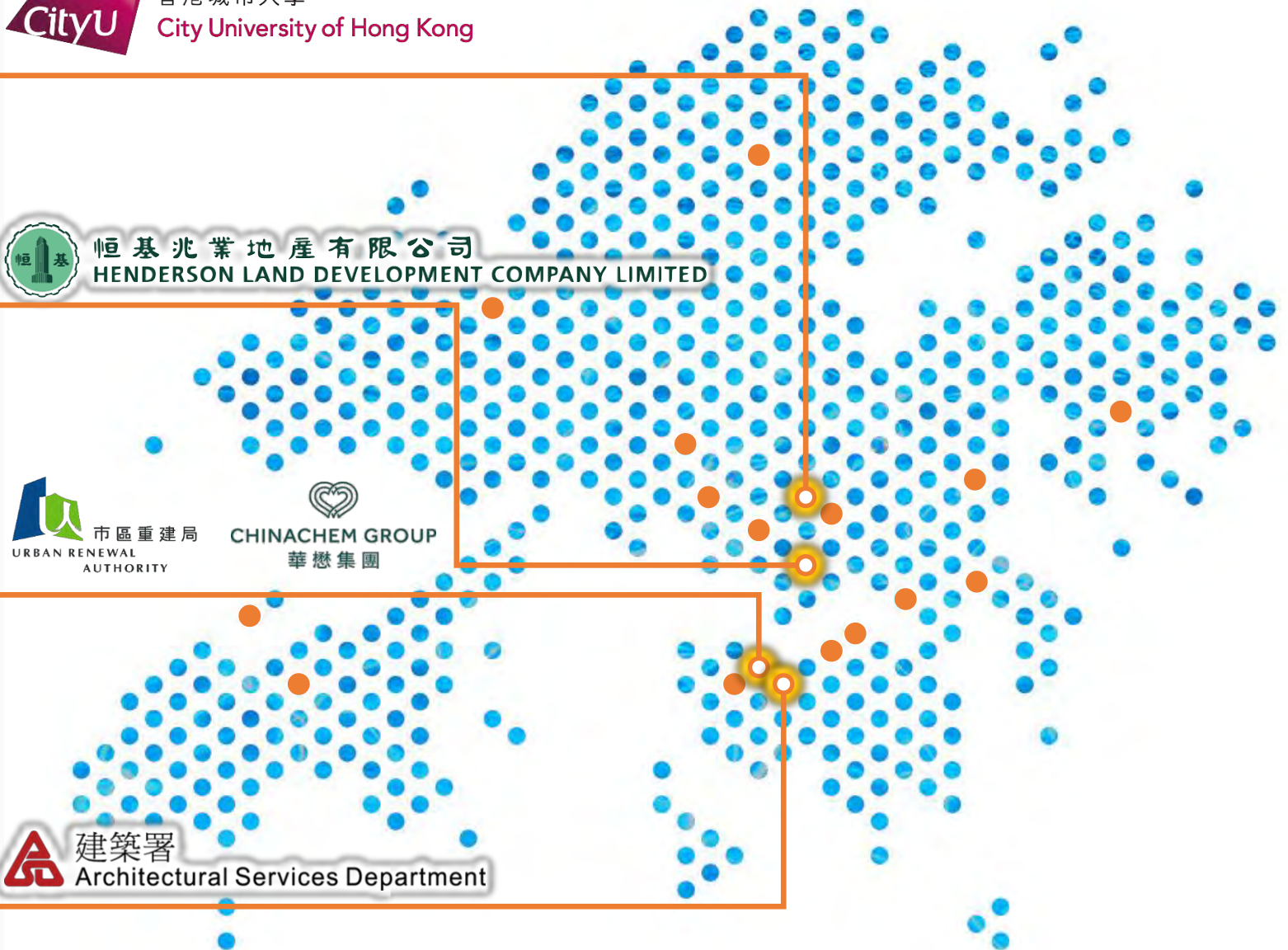

 市區重建局
 URBAN RENEWAL AUTHORITY


 CHINACHEM GROUP
 華懋集團

@Admiralty April. 2022



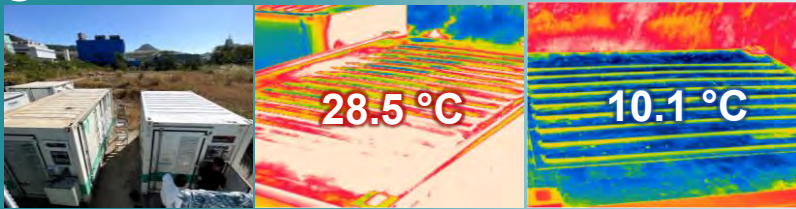

 建築署
 Architectural Services Department



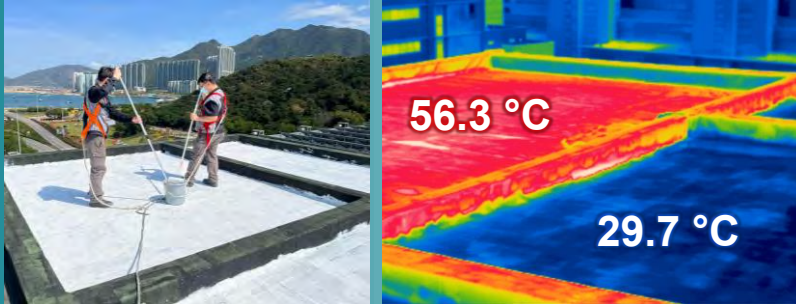
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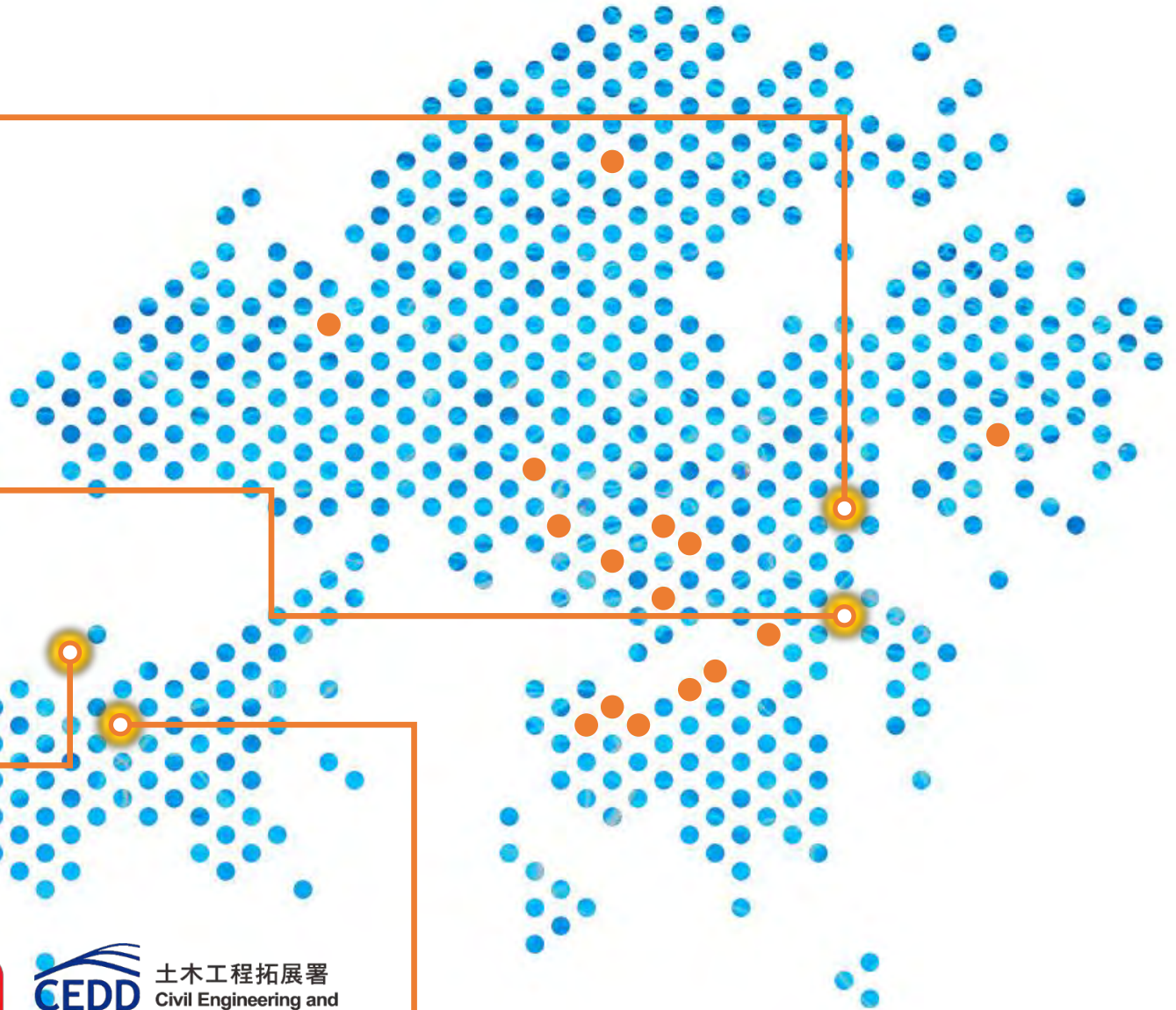
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@Chek Lap Kok March. 2022



@Tung Chung July. 2021

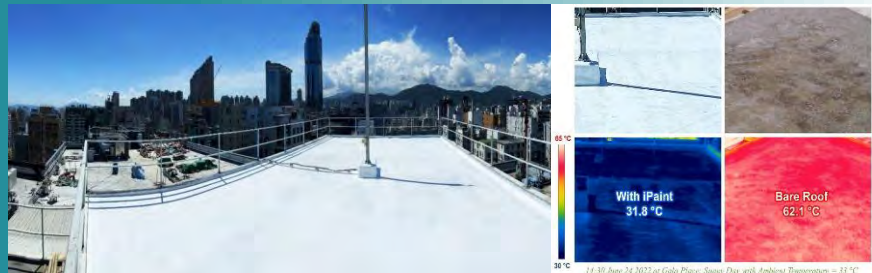


@Yeun Long August. 2022



 **新鴻基地產**
Sun Hung Kai Properties

@Mong Kok June. 2022



 **恒隆集團**
HANG LUNG GROUP

@Mei Foo July. 2022

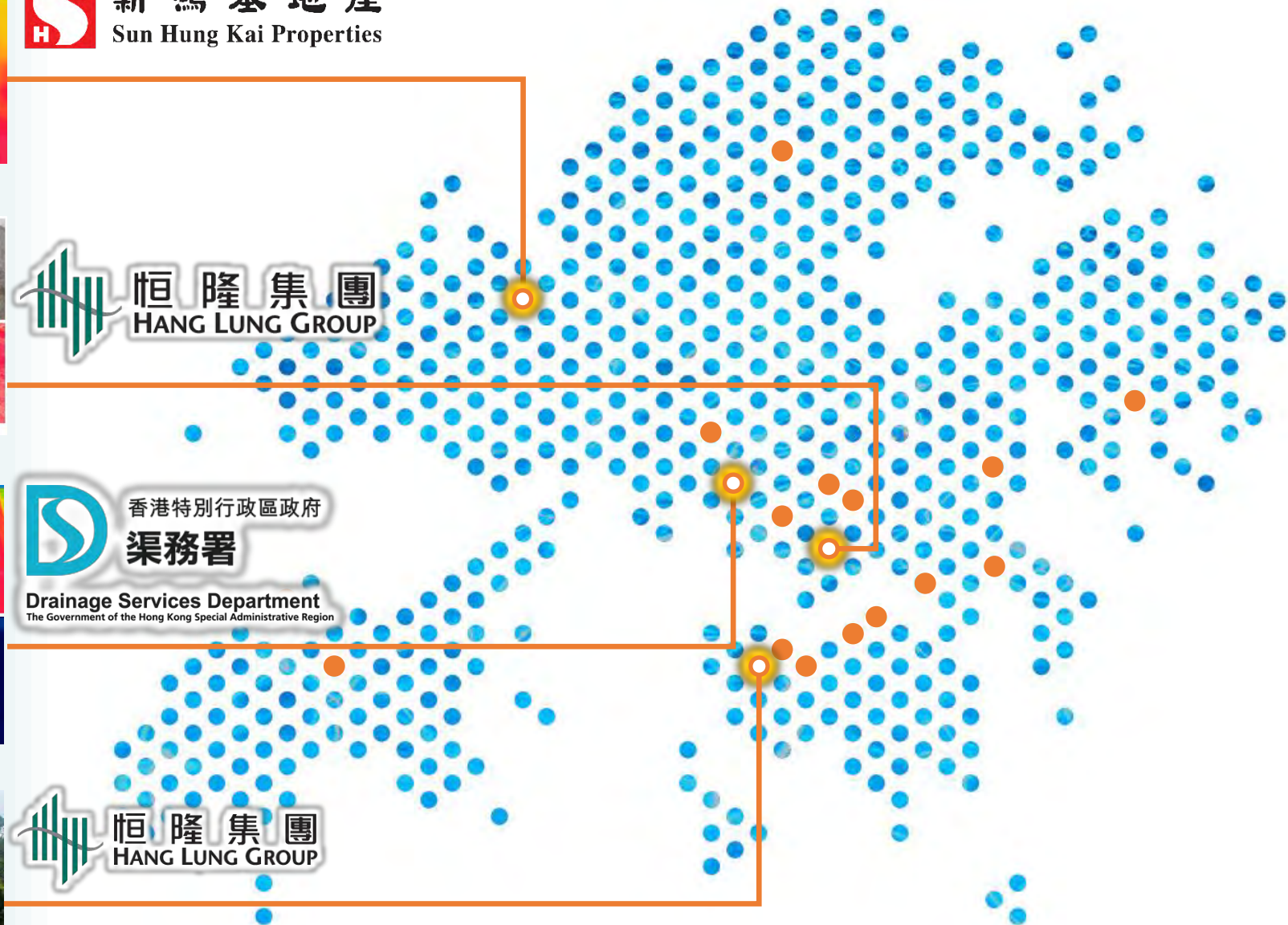


 香港特別行政區政府
渠務署
Drainage Services Department
The Government of the Hong Kong Special Administrative Region

@Victoria Peak August. 2022



 **恒隆集團**
HANG LUNG GROUP



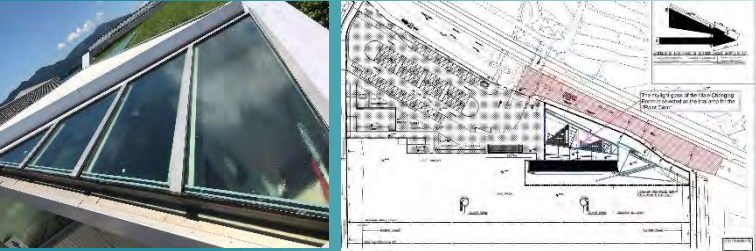
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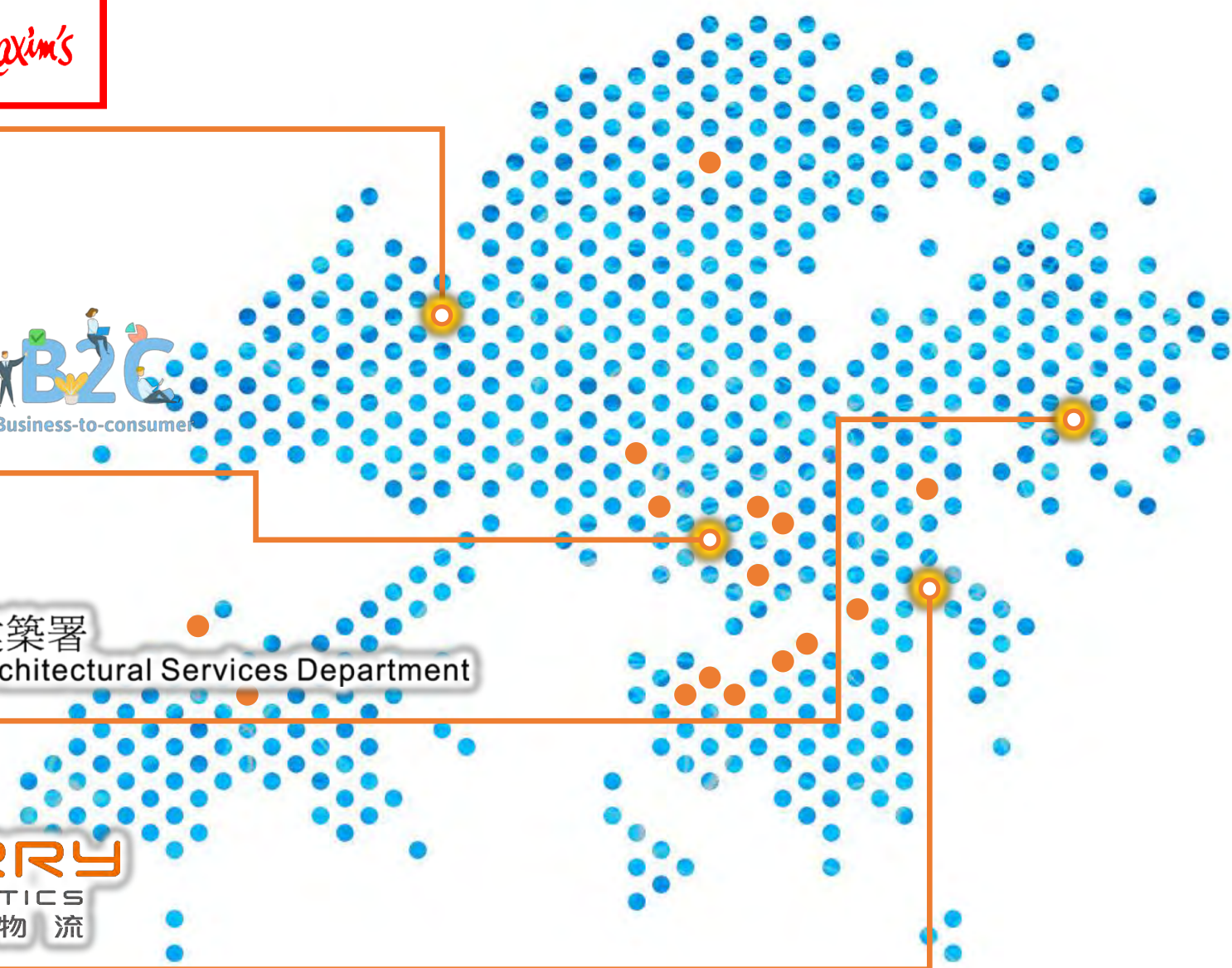
@Sham Shui Po August. 2022



@Tai Mei Tuk September. 2022



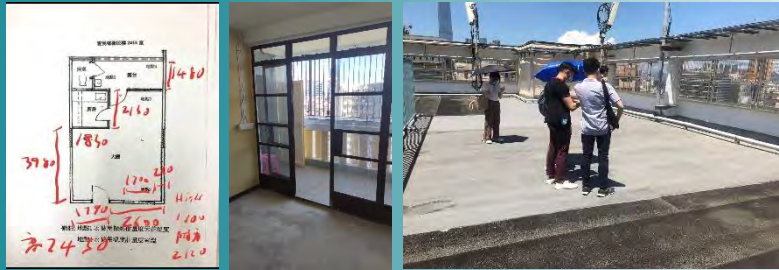
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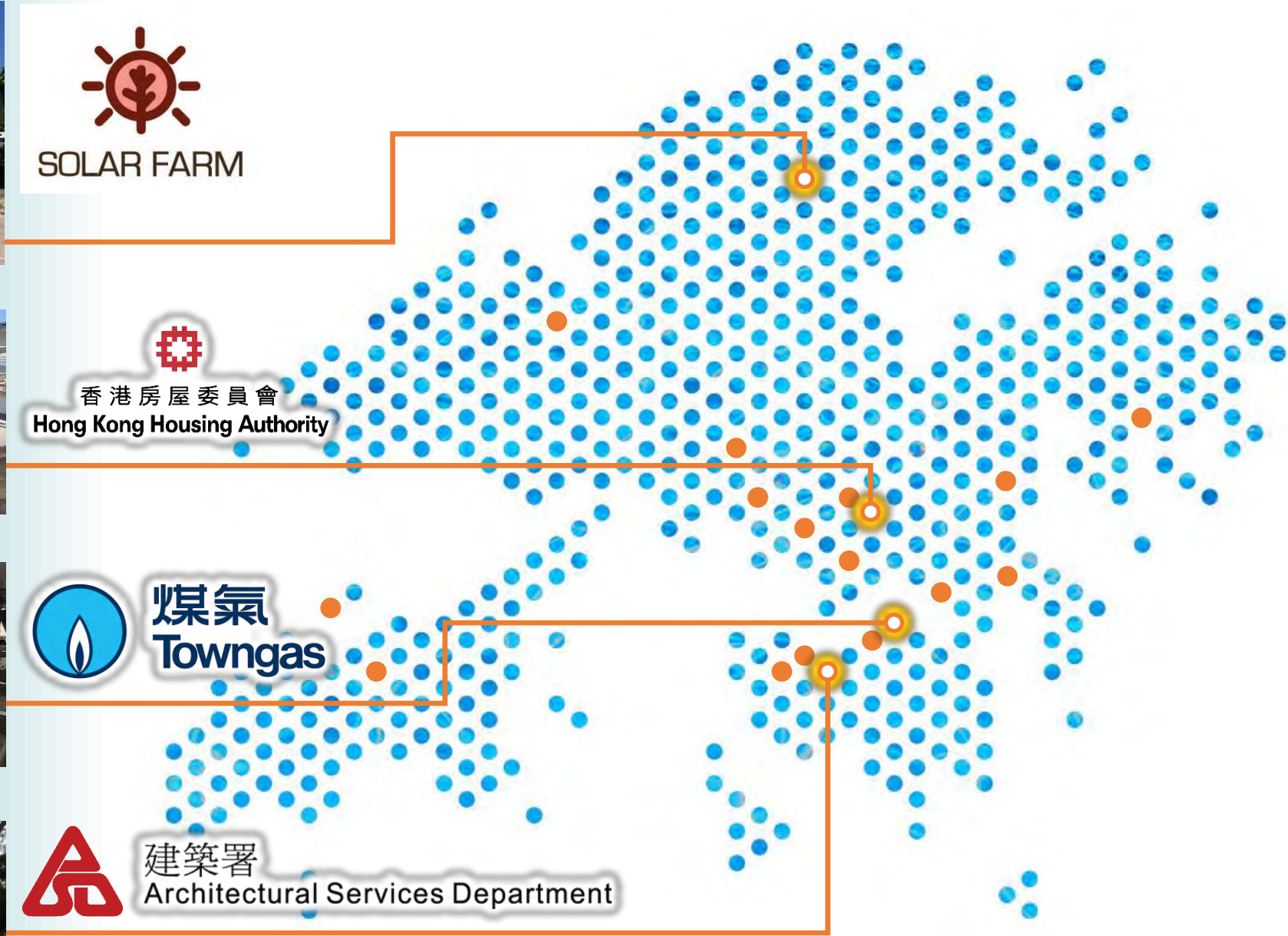
@Ho Man Tin August. 2022



@North Point September. 2022



@Admiralty September. 2022



@Yeun Long August. 2022

@Kwai Chung August. 2022



比高新能源(香港)有限公司



@Sham Shui Po October. 2022



香港特別行政區政府
民政事務總署

@Tung Chung 2022

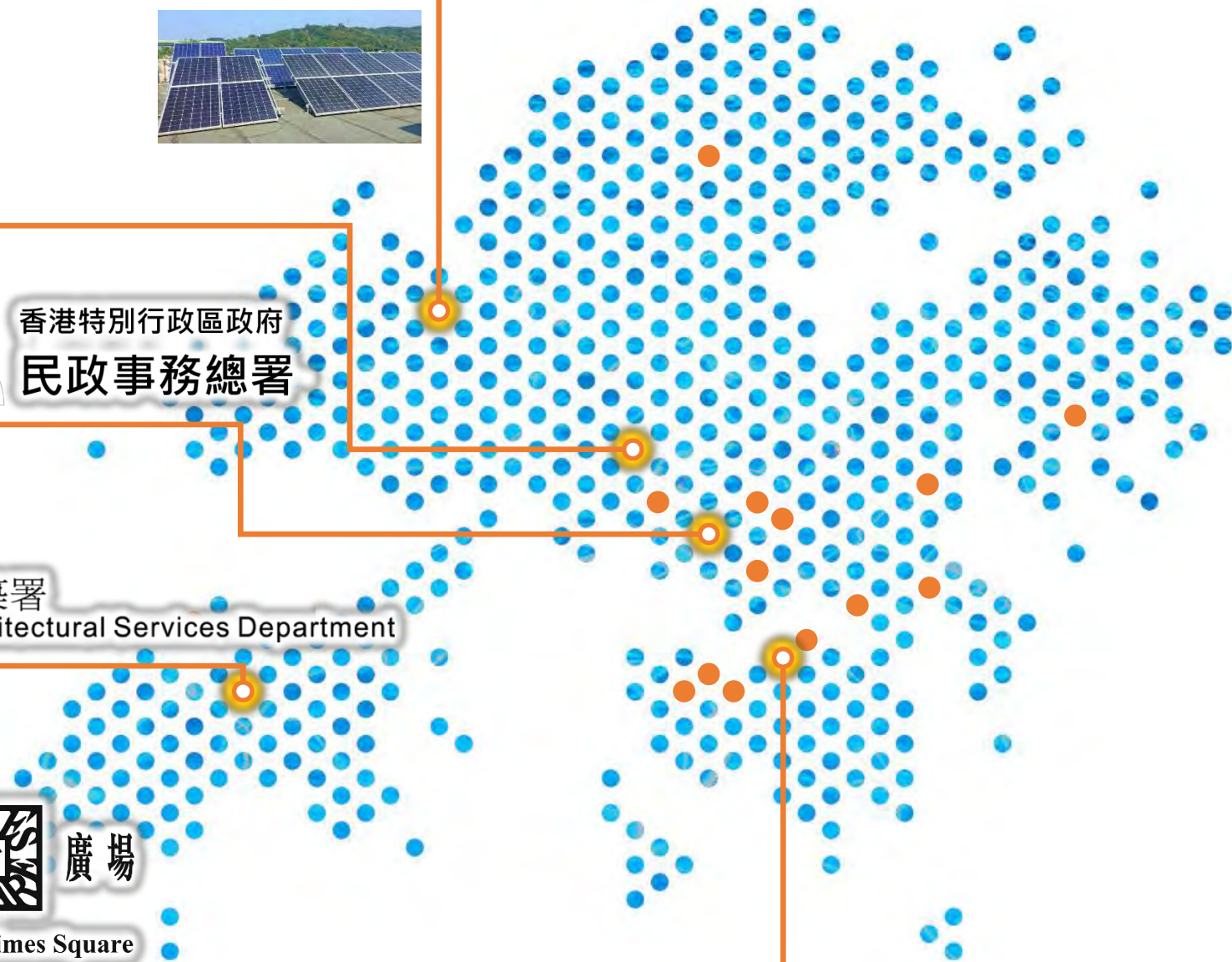


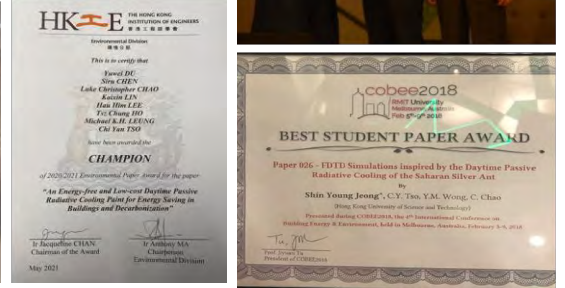
建築署
Architectural Services Department

@Causeway Bay December. 2022

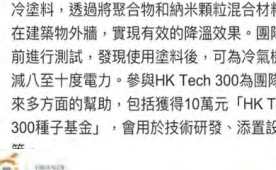
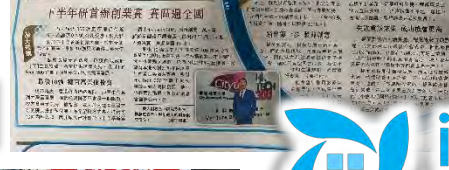
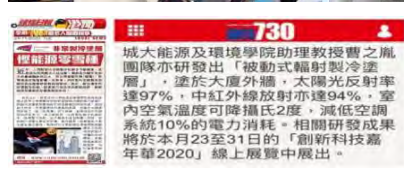
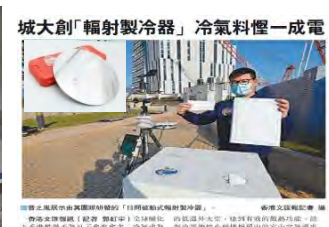


Hong Kong Times Square





To the Goal of Carbon Neutrality



i2coolhk.com

港青初創獲千萬元天使融資 助力節能科技廣泛應用



【橙訊】專注投資港深兩地青年創新創業項目的內地創投國宏嘉信資本，於周二(10日)與城市大學「HK Tech 300」創業計劃培育的初創公司創冷科技簽訂天使投資協議，並舉行簽約儀式。

創冷科技於2021年成立，主要推廣其自行研發的被動輻射製冷技術，以及其他創新節能科技。有別於傳統的空調系統，被動輻射製冷技術能反射絕大多數太陽光，同時有效地將熱量以中紅外方式往外輻射，毋須能源或製冷劑便可達至降溫