Environmental Report

环保报告

环保公屋　开创未来

Greener Public Housing for a Sustainable Future

管治架构

房屋署环保健康安全委员会负责发展和制订房屋署在环保、健康、安全及可持续发展方面的政策方针，并成立小组委员会监督各项环保措施和行动计划的进展及成效。署内个别分处和组别已取得ISO 14001环境管理体系认证和ISO 50001能源管理体系认证。

环保设计与建筑

零灌溉系统—节约用水

房委会已采用零灌溉系统多年，重用雨水作灌溉用途。目前已有28个新建屋邨的花圃使用这个系统，我们的长远目标是在所有公营房屋发展项目广泛应用这个系统。

现时，我们正研究这个系统使用预制构件式设计的可行性，以尽量减少在工地进行的建筑工程。我们在渔湾邨试行使用构件式零灌溉系统，当中包括装设在场外预制的混凝土花圃；又在该屋邨研究使用回收再造的碎玻璃(即碎裂或废弃玻璃)，代替河沙建造构件式零灌溉系统。

东汇邨汇智楼所有花圃均采用零灌溉系统
ZIS is applied in all planters at Wui Chi House, Tung Wui Estate

Governance

The Housing Department Environmental, Health and Safety Committee (HDEHSC) develops and formulates policy direction on environmental, health, safety and sustainability aspects in the HD. A Sub-committee is set up to oversee the progress and performance of environmental initiatives and action plans. Individual divisions and units in the Department have obtained ISO 14001 Environmental Management System and ISO 50001 Energy Management System certifications.

Green design and construction

Zero Irrigation System (ZIS) – water conservation

The HA has long been using ZIS as a means of reusing rainwater for irrigation. Currently, ZIS has been deployed in planters at 28 new housing estates. Our long-term aim is to adopt ZIS widely in all public housing developments.

Currently, we are looking into the feasibility of using prefabricated modular design for ZIS to minimise on-site construction work. A trial of a modular type of ZIS was conducted at Yue Wan Estate, involving the installation of pre-cast concrete planters fabricated off-site. At the same estate, we also undertook a study on using recycled glass cullet (i.e. broken or refuse glass) as a replacement for river sand in the construction of modular ZIS.

渔湾邨试用构件式零灌溉系统
A trial of modular ZIS at Yue Wan Estate

左页左上起顺时针：锦晖苑、欣田邨、晖明邨、欣田邨
Left page, clockwise from top left: Kam Fai Court, Yan Tin Estate, Fai Ming Estate, Yan Tin Estate

微气候研究与空气流通评估

微气候研究和空气流通评估有助我们将风环境、建筑物自然通风、日光穿透、热舒适度、空气污染物排放等因素纳入我们的设计考虑，是提升新设计公营房屋发展项目环境表现的宝贵工具。

为 **26** 个正在进行的项目作空气流通评估

Carried out Air Ventilation Assessments in 26 ongoing projects

Micro-climate studies and Air Ventilation Assessments

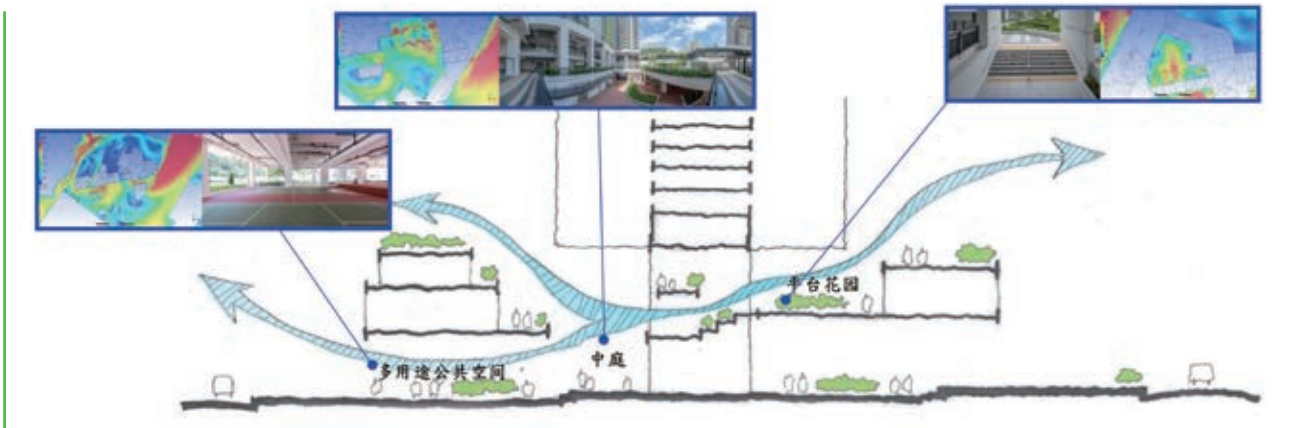
Micro-climate studies and Air Ventilation Assessments are valuable tools for optimising the environmental performance of newly designed public housing developments. These tools enable us to include factors such as wind environment, natural building ventilation, daylight penetration, thermal comfort, and emissions of air pollutants in our design choices.

为 **29** 个正在进行的项目作微气候研究

Conducted micro-climate studies in 29 ongoing projects

观塘安泰邨善用各座大厦的整体布局与座向，预留多条通风走廊和景观走廊

The buildings at On Tai Estate, Kwun Tong, were dispositioned to maximise distances between them to form open breezeway and open space for the whole estate



葵翠邨大楼架高的空间把位于东南面的园景平台和西北面上层平台的内庭院在视觉上连接起来，并形成一道通风廊

The tower of Kwai Tsui Estate is purposely raised to visually connect the landscaped podium at southeast to the internal courtyard on upper terrace at northwest and to form a breezeway corridor

低碳建筑设计

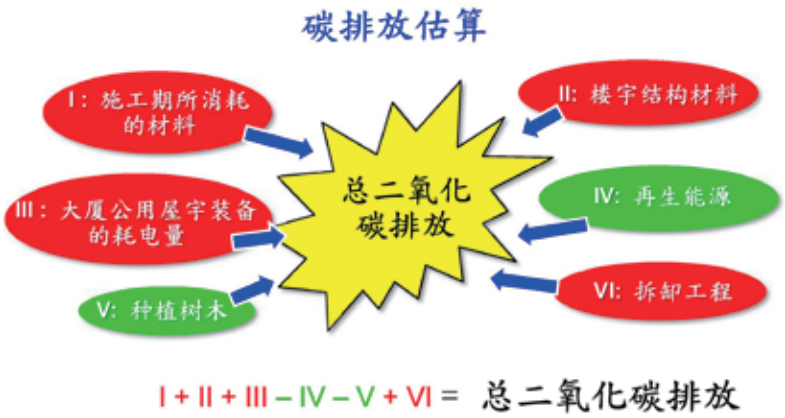
我们利用碳排放量估算方法，估算楼宇在预计生命周期内大概的二氧化碳排放量。这个估算方法有助我们在整个项目周期的各个阶段，为个别大厦以至整个屋邨设定碳排放量基准，可用以比较不同的大厦和屋邨，以及制订可达到的改善目标。

碳排放量估算涵盖经由建筑物料、楼宇结构材料、公用屋宇装备装置运作期间和拆卸工程中产生的碳排放量，并以使用可再生能源和植树等方法予以抵销。这做法有助我们优化屋邨的设计，以达到长远持续发展的目标。

CEE

9 2021/22 年度就9个项目进行碳排放量估算

Conducted CEE for 9 projects in 2021/22



碳排放量估算方法

自采用碳排放量估算方法以来，估计碳排放量减少 **16.55%**

reduction in estimated carbon emission since the roll-out of CEE

环保材料及产品

矿渣微粉是重要的环保建筑材料。我们现有的建筑合约订明，用于建造预制外墙和预制楼梯混凝土的水泥，当中35%必须以矿渣微粉代替。我们现正把这项规定的涵盖范围扩展至建造预制硬地面、预制板间墙和预制垃圾槽。我们的新工程项目规格均符合绿色建筑环境评估(绿建环评)新建建筑2.0版。我们定期修订环保材料及产品指引，以符合香港绿色建筑议会「绿材环评」。

Low carbon building design

We estimate the likely carbon dioxide emissions of buildings over their lifespan by using the Carbon Emission Estimation (CEE) method. The CEE is a methodology that enables us to set benchmarks for the emission levels of both individual housing block and the entire housing estate throughout each stage of the project cycle. These benchmarks can be used to compare different buildings and estates, and to set achievable improvement goals.

The CEE includes an estimate of carbon dioxide emissions generated by materials consumed during construction, materials used in structures, the operation of communal building services installations, as well as emissions caused by demolition activities. It also calculates the emission off-sets generated by renewable energy applications and tree-planting. This enables us to enhance the long-term sustainability of our estate designs.

Green materials and products

Ground Granular Blast Furnace Slag (GGBS) is an important green construction material. In our current building contracts, we specify that 35% of the cement normally used to produce precast façades and stairs must be replaced by the GGBS. We are extending this requirement to cover the production of precast hard paving, partition walls and refuse chutes. Specifications included in our new works projects are all aligned with BEAM Plus for New Building version 2.0. We regularly revise our green materials and products guides to align with Green Product Accreditation & Standards Scheme of the Hong Kong Green Building Council.

绿色建筑认证

绿建环评新建建筑的评估可为我们新建筑物提供建筑环境属性的生命周期评估。房委会所有新建筑物的设计均符合绿建环评评估标准，并以金级评级标准或以上为目标。

Green building recognition

The Building Environmental Assessment Method Plus for New Buildings (BEAM Plus NB) provides a lifecycle assessment of the environmental attributes of our new buildings. All the HA's new buildings are designed to meet BEAM Plus assessment criteria, and aim at Gold rating standard or above.

建筑项目与评级　Project & Rating

（新建建筑1.2版暂定评级） (NB V1.2 Provisional Assessment)	（新建建筑1.2版最终评级） (NB V1.2 Final Assessment)
金级 Gold	**铂金级 Platinum**
东涌第99区 Tung Chung Area 99	东涌迎东邨 Ying Tung Estate, Tung Chung
东涌第100区 Tung Chung Area 100	沙田旭禾苑 Yuk Wo Court, Sha Tin
启德第2B2区地盘 Kai Tak Site 2B2	
屯门显发里 Hin Fat Lane, Tuen Mun	**金级 Gold**
屯门恒富街 Hang Fu Street, Tuen Mun	新蒲岗景泰苑 King Tai Court, San Po Kong
元朗朗边第一期 Long Bin Phase 1, Yuen Long	屯门欣田邨 Yan Tin Estate, Tuen Mun
将军澳昭信路 Chiu Shun Road, Tseung Kwan O	长沙湾丽翠苑 Lai Tsui Court, Cheung Sha Wan
上水第4及30区第2号地盘 Sheung Shui Areas 4 and 30 Site 2	黄大仙东汇邨汇智楼 Wui Chi House, Tung Wui Estate, Wong Tai Sin
上水第4及30区第1号地盘 Sheung Shui Areas 4 and 30 Site 1	葵涌尚文苑 Sheung Man Court, Kwai Chung 马鞍山锦晖苑 Kam Fai Court, Ma On Shan

节约能源　Energy conservation

详细设计工程项目中，**22** 幢住宅大厦的公用地方屋宇装备装置的平均能源消耗量为每年每平方米 **21.33** 度

Average energy consumption of building services installations in communal areas of 22 domestic blocks at detailed design was 21.33 kWh/m^2/annum in 2021/22

可再生能源

自2011年以来，我们一直为所有新的公共租住房屋项目安装接驳电网的太阳能光伏发电系统，并参与电力公司的上网电价计划。目前，我们太阳能光伏发电系统的设计供电量为大厦公用电力需求的1.5%至2.5%。

Renewable energy

Since 2011, we have been installing grid-connected photovoltaic (PV) systems in all new public housing rental projects, and participating in the feed-in tariff programmes of electricity supply companies. Currently, our PV systems are designed to supply 1.5% to 2.5% of the building's communal electricity demand.

太阳能光伏发电系统（截至2022年3月）　**PV Systems** (as of March 2022)

已在 Installed in **140** 幢住宅大厦安装，domestic blocks,

总发电容量为 with a total system capacity of **1 229** 千瓦 kW

推广电动车辆

为配合政府的《香港电动车普及化路线图》，所有新建屋邨室内私家车停车场，已全部具备电动车充电设施的配套，当中三成泊车位已安装电动车充电器。

建筑物的能源效益

房委会在辖下所有新工程项目加入多项节能措施，包括在住宅和非住宅大厦的无障碍通道采用二级光度的照明系统；以及安装节能的发光二极管凸面照明器、发光二极管出口指示牌和方向指示牌。安装新的升降机系统时，我们采用高效节能的无齿轮升降机；当永磁同步电动机在市场上有供应时，将逐步在无齿轮升降机采用永磁同步电动机。我们也在8 000瓦功率或以上的升降机系统使用再生动力。为鼓励租户节约能源，我们在新建住宅大厦入口大堂安装智能计量仪监察系统，向租户展示所住大厦和邻近大厦每月的电力、煤气和食水消耗量。

智能计量仪监察系统
Smart Metre Monitoring and Energy Display System

屋邨生态环境

晖明邨•
融合共处　各居其所

在房屋设计和发展过程中，我们考虑区内的生态环境，尤其是具高生态价值的发展项目地盘，确保区内的天然资源和生态系统得以保护和保存。晖明邨便是个好例子。该屋邨所在地区的蝴蝶品种繁多。事实上，该区录得约78种蝴蝶，占香港蝴蝶品种总数约三成。有见及此，我们的设计师在晖明邨特别辟设2 000平方米的生态过渡区，以吸引各种蝴蝶；最终有大量不同品种的蝴蝶在邨内栖息。

Promoting electric vehicles (EVs)

In support of the Government's Hong Kong Roadmap on Popularisation of Electric Vehicles, we have adopted 100% EV charging enabling facilities in indoor private car parks of all new estates, among which 30% of parking spaces are equipped with EV chargers.

Energy efficiency in buildings

The HA has incorporated a number of energy-saving measures in all its new works projects. Such measures include the use of a two-level lighting system for barrier free access in domestic and non-domestic blocks, along with the installation of energy efficient LED bulkhead lights and LED exit signs and directional signs. When installing new lift systems, we have adopted energy efficient gearless lifts and are moving towards the use of permanent magnet synchronous motors for these gearless lifts as they become available on the market. Regenerative power is also being used for lift systems with motors of 8kW or above. To encourage tenants to save energy, we are also installing Smart Metre Monitoring and Energy Display Systems at the main entrance lobbies of new housing blocks, which display information on the monthly consumption of electricity, gas and fresh water of their block as well as neighbouring blocks.

Estate ecology

As part of our housing design and development process, we take into account the local ecology, especially at development sites of high ecological value, to ensure that local natural resources and ecosystems are protected and conserved. A good example of this can be seen at Fai Ming Estate, a public housing development in an area of high butterfly diversity. Some 78 species of butterfly were recorded in the area, representing around 30% of all the species in Hong Kong. With this in mind, our designers created a 2 000-sq.m. Ecological Transition Zone at Fai Ming Estate specially designed to appeal to butterfly species. The end result was an abundance and high diversity of butterflies at the estate.



晖明邨的生态过度区
The Ecological Transition Zone at Fai Ming Estate

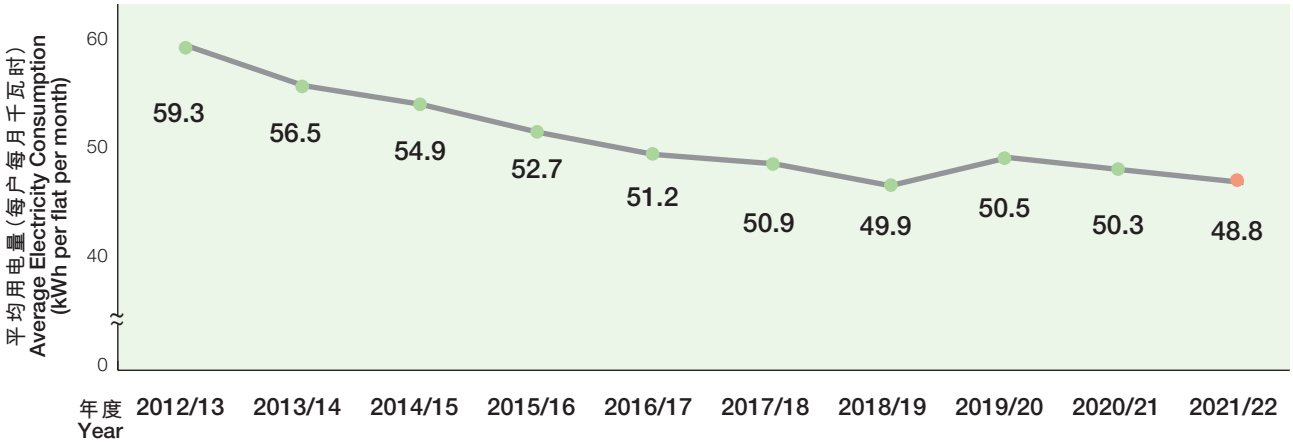
节约能源与碳排放管理

我们继续为辖下所有公共屋邨更新ISO 14001环境管理体系认证，并为所有公屋住宅大厦公用地方更新ISO 50001能源管理体系认证。此外，我们继续就14幢典型住宅大厦定期进行碳审计工作，监察碳排放情况。

Energy conservation and carbon management

We continued to renew the ISO 14001 certification for Environmental Management System (EnMS) for all PRH estates, and ISO 50001 certification for Energy Management System in the communal areas of all PRH domestic blocks. We also continued to carry out regular Carbon Audit exercises in 14 typical domestic block types to monitor carbon emissions.

屋邨公共地方的用电量　Electricity Consumption in the Public Areas of Estates



14 幢典型住宅大厦的碳足迹与 2011/12 年度相比平均减少 **20%**
Carbon Footprint of 14 Typical Housing Blocks decreased by against 2011/12 on average

废物管理

入樽机先导计划

我们与环境保护署(环保署)合作,在公共屋邨推行各项以推广减废及回收再造为目标的计划,其中一项是第二期都市固体废物收费实践计划。该计划2021年5月至12月推行,涵盖九个公共屋邨共50幢住宅大厦,旨在加深居民对固体废物收费安排的了解。年内,房委会也参与环保署其他持续推行的试验计划,其中一项是在三区共63个公共屋邨收集可回收的塑胶物料。此外,我们在三个屋邨设置逆向自动售货机(入樽机),回收塑胶饮料容器;在18个商场/街市收集厨余;并在2021年12月至2022年3月于一个公共屋邨试用智能回收箱收集家居厨余。

为提高租户的减废意识,我们在2021年12月把宣传减废的影片上载至房委会的Facebook专页,并在2022年1月至4月安排这些影片于房屋资讯台播放。此外,我们在公共屋邨的公用地方展示宣传横额和海报,鼓励租户在日常生活中养成「惜物减废」的良好习惯。

Waste Management

In collaboration with the Environmental Protection Department (EPD), we have been conducting various projects which aimed at promoting waste reduction and recycling in PRH estates. One of these projects was the Phase Two Municipal Solid Waste (MSW) charging trial, which was launched from May to December 2021 in nine PRH estates with a total of 50 domestic blocks, to enhance residents' understanding of the MSW charging arrangement. The HA also took part in various other ongoing EPD trials throughout the year, one of which was a trial scheme for collecting plastic recyclable materials in three districts covering 63 PRH estates. Besides, we have installed reverse vending machines (RVM) to collect plastic beverage containers for recycling at three estates; collected food waste at 18 shopping centres/wet markets; and launched a trial by using smart recycling bin for collecting domestic food waste at one PRH estate from December 2021 to March 2022.

To raise tenants' awareness, videos on waste reduction were posted on the HA's Facebook page in December 2021 and broadcast on the Housing Channel from January to April 2022. In addition, promotional banners and posters have been displayed in the common areas of PRH estates to encourage tenants to practise a good habit of "Use Less, Waste Less" in their daily lives.

公共屋邨公用地方展示宣传减废的横额
Promotional banners on waste reduction displayed in the common areas of PRH estates

梨木树邨设置入樽机,回收使用完的塑胶饮料容器
RVM placed at Lei Muk Shue Estate to collect used plastic beverage containers

连翠邨试用智能回收桶收集厨余
A trial of using smart bin to collect food waste at Lin Tsui Estate

绿化环境与树木管理

2021/22年度，房委会致力在20个公共屋邨加强现有绿化工作。除广植花木外，还引进更多植物品种，特别是最适宜在本地环境生长的植物；并在20个屋邨举办绿化活动，让居民一同参与植树和园艺活动，为屋邨社区出一分力。

我们定期检查辖下屋邨的树木，确保所种植的树木安全健康。这项工作根据房委会中央电子树木数据库进行，利用地理信息系统备存最新的树木数据。此外，我们运用一套在网上平台的电脑化企业树木管理系统，并配备流动装置应用程式，用以储存详细的树木资料和记录每年树木风险评估工作中得知的树木状况。年内，我们再次动员社区力量，支援树木管理工作，招募约690名屋邨居民担当屋邨树木大使，协助监察树木状况。

举办绿化活动

我们在十个屋邨举办植树日，并在十个屋邨推行一系列社区园圃计划；又透过Facebook专页、房屋资讯台、海报、横额等渠道，向居民推广绿化和推行公众教育。

深水埗富昌邨的植树日
Tree Planting Day at Fu Cheong Estate, Sham Shui Po

公共屋邨绿化活动及废物回收设施

Greening and tree management

In 2021/22, the HA undertook to enhance the existing greenery at 20 PRH estates. This involved increasing planting and adding more varieties of plants, especially plants that best matched the local environmental conditions. Greening activities were also organised at 20 estates, whereby residents could contribute to their community by taking part in the planting and gardening activities.

We conduct regular tree inspection work to ensure the trees planted in HA's estates remain safe and healthy. This work is based on HA's centralised electronic tree database, which utilises the Geographic Information System to keep tree data up to date. In addition, we operate a computerised Enterprise Tree Management System on a web-based platform with a mobile device application, enabling us to maintain a detailed tree inventory and record condition of trees in the annual tree risk assessment exercise. We once again drew on community help to support our tree management efforts, recruiting about 690 Estate Tree Ambassadors from residents to help monitor trees during the year.

Organising green activities

We organised tree planting days in 10 estates and a series of community garden programmes in 10 estates. Green publicity and public education were also conducted through channels such as Facebook, the Housing Channel, and displays of posters and banners.

葵青大窝口邨的社区园圃计划
Community Garden Programme at Tai Wo Hau Estate, Kwai Tsing

节能和低碳管理 Energy saving and carbon management

房委会办公室的省电量
Electricity Saving in HA offices

2021/22 年度节省 **2.2%**
Saved **2.2%** in 2021/22

超出较 2018/19 基准年度少 **0.5%** 的目标
Exceeding our target of **0.5%** reduction against base year 2018/19

废物管理 Waste management

房委会办公室的耗纸量
Paper Consumption in HA offices

2021/22年度减少 **9.4%**
Reduced by **9.4%** in 2021/22

超出较 2013/14 基准年度少 **4%** 的目标
Exceeding our target of **4%** reduction against base year 2013/14

节约用水 Water conservation

房委会总部的用水量
Water Consumption in HA Headquarters (HAHQ)

2021/22年度减少 **24.4%**
Lowered by **24.4%** in 2021/22

远超 2015/16 基准年度少 **2.75%** 的目标
Far exceeding our target of **2.75%** reduction against base year 2015/16

上述措施的详情和各项环保议题的目标或成果，请浏览以下网页：

2021/22年度和2022/23年度的环保工作目标与前景

房委会绿色生活网站

For details of the above initiatives and the targets or results in various environmental issues, please visit:

Environmental Targets and Outlook for 2021/22 and 2022/23

HA's Green Living mini-website

统计数字摘要 Summary of Statistics

能源消耗 Energy Consumption

	已消耗能源 Energy consumed
现有屋邨的能源消耗量 Energy Consumption in Existing Housing Estates	**(千瓦时) (kWh)**
屋邨公众地方的用电量 Electricity consumption in public areas of estates	447,446,890
屋邨公众地方的平均用电量(每户每月) Average electricity consumption in public areas of estates (per flat/month)	48.8
太阳能光伏发电板产生的可再生能源量 Renewable energy generated from PV panels	1,014,164

房委会办公室的能源消耗量 Energy Consumption in HA Office Premises	**(千瓦时) (kWh)**
办公室的用电量 Electricity consumption in office premises	34,392,645
办公室的平均用电量(每名员工) Average electricity consumption in office premises (per staff)	3,453

建筑工程承建商的能源消耗量 Energy Consumption by Construction Contractors	**(千兆焦耳) (GJ)**
建筑活动的柴油消耗量 Diesel consumption for construction activities	1,041,067
运输建筑废料的柴油消耗量 Diesel consumption for transportation of construction waste	50,873
建筑活动的用电量 Electricity consumption for construction activities	100,789
合约车辆的汽油消耗量 Gasoline consumption for contract cars	16,156

温室气体排放 Greenhouse Gas (GHG) Emissions

	2016/17	2017/18	2018/19	2019/20	2020/21
现有屋邨住宅大厦的温室气体排放强度(公吨二氧化碳当量／平方米) GHG Emission Intensity in Existing Housing Domestic Blocks (tonnes CO_2e/m^2)					
各住宅大厦类型的平均数 Average of domestic block types	0.025	0.025	0.024	0.024	0.024
房委会办公室的温室气体排放强度(公吨二氧化碳当量／平方米) GHG Emission Intensity in HA Office Premises (tonnes CO_2e/m^2)					
房委会总部第三座 Block 3 of HAHQ	0.123	0.112	0.107	0.113	0.110
乐富客户服务中心 Lok Fu Customer Service Centre	0.144	0.140	0.136	0.139	0.138

物料使用 Materials Consumption

	已使用物料 Materials Consumed
房委会办公室的物料使用量 Materials Consumption in HA Office Premises	
房委会办公室的耗纸量(令／员工) Paper consumption in office premises (reams/staff)	13.5

水资源管理 Water Management

	用水 Water Consumed	回收再用水 Water Recycled
新工程项目的用水量(立方米) Water Consumption in New Works Projects (m^3)		
新工程项目 New works projects	1,780,563	469,157
现有屋邨的用水量(立方米) Water Consumption in Existing Housing Estates (m^3)		
屋邨公众地方 Public areas of estates	3,463,238	—
房委会办公室的用水量(立方米) Water Consumption in HA Office Premises (m^3)		
房委会总部 HAHQ	10,095	—
房委会总部(每名员工) HAHQ (per staff)	2.48	—

废物管理 Waste Management

	处理方法 Handling Method		
	已回收 循环再造 Recycled	已运往 公众填土区 Public fill	已运往 堆填区 Landfill
新工程项目的废物处理量(公吨) Amount Handled in New Works Projects (tonnes)			
有害废物 Hazardous waste	12.92	—	5.67
非有害废物 Non-hazardous waste	375,102	1,313,089	80,998
新工程项目的废物总量 Total waste for new works projects			1,769,208
现有屋邨的废物处理量(公吨) Amount Handled in Existing Housing Estates (tonnes)			
非有害废物 Non-hazardous waste			
废纸 Paper	28,478	—	—
胶樽 Plastic bottles	3,047	—	—
铝罐 Aluminium cans	2,393	—	—
旧衣物 Used clothes	745	—	—
玻璃樽 Glass bottles	687	—	—
月饼盒 Mooncake boxes	13	—	—
房委会总部的废物处理量(公吨) Amount Handled in HAHQ (tonnes)			
有害废物 Hazardous waste			
碳粉盒 Toner cartridges	4	—	—
慳电胆及光管 Fluorescent lamps and tubes	3	—	—
非有害废物 Non-hazardous waste			
一般废物 General waste	—	—	136
废纸 Paper	120	—	—