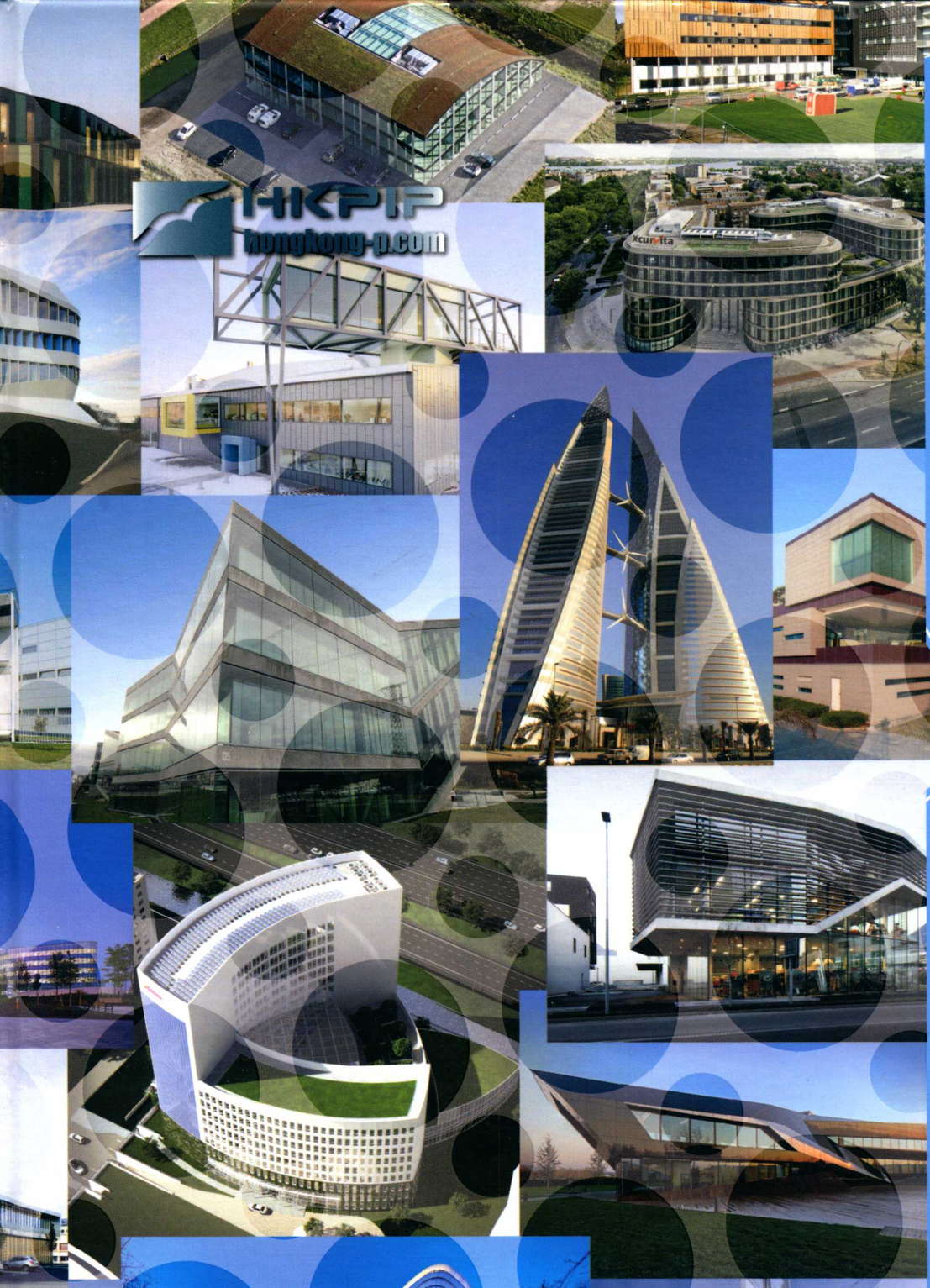

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USA LEED
Blue Angel
European Solar Prizes
Japan CASBEE
Canada GBTool
GSC

节能办公建筑 Green Office Building II Vol.2

香港理工国际出版社 主编

生态+能效+再生

生态觉醒 Awaken

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Awaken II

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善用其效 尽享其能

Wisely Material Use
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Improve Office Quality by Building Green Office

生态节能办公楼的发展

With the high speed development of social economy and science and technology, a lot of commercial buildings and offices are or have been built in large and middle cities, and the office environment are becoming more and more intelligentized and slap-up. A building which has been decorated aboratively and configured with modern office equipments and central air conditioning system will be comfortable and convenient. However, a latest research of London showed that the indoor air pollution in modern buildings is more harmful to people's health than outdoor smoke for a long term. On the "International Indoor Air Quality Seminar" hold in Beijing in 1997, over ten Chinese and foreign professionals told us: a modern people spends over 80% of time in indoor environment and the most air he breathes is indoor air and there are many kinds of contamination in indoor air which would do harm to people's health badly if they are not controlled effectively. In fact, over 30% of the people in the offices have the office syndromes such as headache, qualm, sleepy, tired, and even hard to breath, heart rate being irregular and abalienation. But when they leave the office, the above syndromes will lighten or disappear. According to the reports of German "Sunday Chart Newspaper", about 1600 thousands office people have those strange sicknesses in Germany. Germans call those as "Monday Syndrome"; World Health Organization (WHO) calls those as"Building Syndrome", and we call those as "Office Syndrome" generally. The reasons causing the "Office Syndrome" mostly include environment factors, pollution factors, human pollution and so on.

In developed countries, nation leaders and environment protection professionals pay more and more attention to the office air pollution. Office air quality becomes one of the most important indexes which are used to measure the living and health level of office workers.

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随着人们对能源节约及环境保护的日益重视，对生活品质及身心健康要求的日益提高，也得益于各种高新技术的发展与应用，生态写字楼戴着神秘的面纱，渐渐进入了我们的视线，作为人类三分之一生命的载体，它所带来的不仅是一种高品质的建筑，同时也是一种全新的工程建设理念。

我国目前也有许多写字楼被冠以智能写字楼、甲级 5A 写字楼等名称，但它更多的是指建筑电子控制系统如 OA（办公智能化）、BA（楼宇自动化）、CA（通信传输智能化）、FA（消防智能化）、SA（安保智能化）等，合称建筑管理系统（BMS），但这只是要求的一部分，除了有优秀的 BMS 外，真正的生态写字楼更强调建筑生命周期内的经济性、节能性和环境友好性。在人性化方面，则更重视使用者更深层面的心理和生理感受。

世界范围内大量存在的工业化现代建筑，代表了人类的现代文明和工程技术的进步。但随着时间的推移，人们发现在其高耸入云、富丽堂皇的外观下存在着许多问题，如巨大的能耗让业主越来越难以承受；环境恶化及城市热岛效应的影响日益凸显；封闭空间、含氧量不足和较少的自然采光，使人易于疲劳、工作效率低下；室内空气污浊，各种化学装修材料释放的污染物容易引起疾病，被世界卫生组织定义为“建筑病综合症”；大型空调系统导致交叉感染，加剧各种传染病的蔓延，而系统内很多地方常年得不到清扫，滋生病菌；过于拥挤和压抑的办公环境，还可引发不同程度的心理问题。正是因为对上述问题的困惑，促使人们对工业化现代建筑进行反思与改进。终于，生态写字楼于 20 世纪 90 年代初在欧洲和美国诞生。

到底怎样的写字楼才是一个真正意义上的生态写字楼呢？ HKPIP 认为它应具有以下特点：

1.低能耗特性

当前，我国大型写字楼的能耗是相当巨大的。有统计显示，北京、上海等

In the 21st century, green surrounding, green production, and green consumption will become the style that people are pursuing after. In order to improve the working environment of modern commercial buildings and advance office air quality effectively, all the nations throughout the world especially the developed nations are applying themselves to control the office air contamination.

Presently, there are millions of modern office equipments of different trademarks and types including duplicating machine, engineering manifolder, laser printer and so on in China. Now, there are large quantities of out-of-date duplicating machines which cause serious contamination in use. In order to satisfy the environment protection standard, most manufacturers install an ozone filtering piece on the exhaust opening of the duplicating machines. This filtering piece is produced with urethane foam infusing a spot of active carbon and catalyzer which is easy to renovate and the cost is low, but the filter effect is imperfect. The new duplicating machines of many consumers release smoky ozone and organic waste gases. The reason is simple. It is because the ozone piece contacting time is too short to make the process of catalyse oxidation thoroughly, and it will be of no use when copying multitudinously. It is said that foreign duplicating machines are installed the same filtering materials, but they keep people far from the machines so as to reduce the direct endanger of ozone and organic waste gases to human's health.

Foreign companies are concerned about the office air quality and the workers' health and their popularization rate of office air cleaners is high. It is reported that the company offices are almost deployed different types of air cleaners in Europe nations.

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The foreign air cleaners have four types: the first one is filter type cleaner whose materials have three types including non-woven fabrics, active carbon fibrin and hyperfiltration membrane, which is mainly used to filter indoor floating dust and bacteria, the second one is electrostatic type cleaner applying high-pressure electrostatic field, which is mainly used to eliminate the smog, floating dust and peculiar smell; the third one is negative ion type cleaner which is mainly used to clean air and protect workers' health; the last one is compound type cleaner which combines the above three functions so as to improve the cleaning effects.

The modern office is an important space for people to work, study and contact with each other where people stay for the longest period in one's life. Some western professionals pointed out that a common worker will spend 100 thousand hours in office throughout his life. This number is enough to show the significance of office environment to "office workers". An information analysis indicated that the present office space can be devised into four types: traditional sparrow nest type, penetralia type; and modern open honeycomb type, untime club type. However, they are all not ideal offices environment without humanization and environment protection atmosphere.

The following are some methods for constructing modern green office space.

1. Advance effective environment protection system and strengthen indoor environment consciousness.

The relational government departments should establish indoor air quality standards and inspection systems to make quality attestation for production, sale and use of the air cleaning equipments. At the same time, they should strengthen the propaganda of the relation.

大城市的中大型写字楼的耗电量每年高达 100 ~150kWh/m^2，这还不包括煤气、热力等其他能源的消耗。如此巨大的能耗给国民经济、能源供给及环境保护都带来了巨大的负担。而一幢生态写字楼可将能耗降低 30% ~50%，给国家、社会和租户都带来巨大的好处。生态写字楼的低能耗特性应符合以下标准：

- 达到并超过国家节能50%的要求
- 向国际先进水平看齐
- 利用可再生能源
- 降低生命周期内的消耗
- 控制初投资

2.环境友好特性

在建造及生命周期内，生态写字楼都应将对环境和区域生态链的冲击，尽可能减至最低水平。特别是在大都市中，应避免局域风场、热岛效应、声光污染等带来的影响。

3.健康舒适的室内环境特性

目前，大型写字楼内的舒适度都被简单地表示为室内的温湿度指标，但这对于生态写字楼来说是远远不够的。据美国权威组织空调制冷协会（ASHRAE）的研究报告表明，糟糕的室内舒适度和空气质量会降低工作效率并导致疾病，而一个舒适健康的室内工作环境可有效提高其内部工作人员 6％至 8％的工作效率。

据另一项统计结果，若将所有在其中工作的人的人工成本都计入一幢写字楼生命周期内的成本，那么此写字楼建造成本仅占 2％，其能源消耗、设备维护更换、物业管理和二次装修的费用约占 6％，而占总成本 92% 的是这幢大厦的使用者的人工成本。因此从上述两项研究可看出健康舒适的室内环境的重要性。

一个生态健康室内环境应符合下述标准：

- 温度18~26摄氏度
- 湿度35%~65%
- 风速＜0.2m/s

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● 无副作用冷热辐射面的形成
● 室内空气中各污染物浓度不大于健康限值
● 新风量不低于40m^3/h.p
● 没有噪声干扰
● 适宜的自然或人工照度

4.亲自然特性

人是一种亲自然的动物。但由于现代文明的发展，人类不得不生存在一个钢筋混凝土的人工制造的环境中。因此，一个生态写字楼应尽可能降低对各种人工手段的依赖，充分利用外界的自然气候，增加自然通风和自然采光，并通过空中花园、室内生态中庭等灰色空间的设置来满足使用者亲自然的需求。

5.高度集成智能控制特性

生态写字楼应具有精心设计的智能楼宇自控系统（BMS），将建筑物（或建筑群）内的电力、照明、空调、给排水、防灾、保安、广播、通信等设备以集中监视与管理为目的，构成一个综合系统，使建筑物成为具有舒适的工作与生活环境、设备高效运行、整体节能效果最佳的安全场所。

6.现代化高效率特性

生态写字楼应满足人类现代社会高效便捷的需求，因此应当具有快捷的垂直及水平交通、高效的内部网络、便利的通信系统等。

7.人性化的服务体系

除上述各方面的硬件设施外，生态写字楼还应具备人性化的软设施——人性化的服务体系，以达到最大化提升办公品质的目的。

生态写字楼不是一个单一的产品，而是一个成系统的技术集成，多方面有机整合的复杂的产品，拥有其自身独特的特征。因此，在设计时应从上述特点出发，充分考虑各方面因素，才能有针对地设计出真正的生态节能建筑。

2. Take active and effective measures to control pollutant resources.

Foreign professionals generalized the indoor pollution and its danger into two manners: fixed resources and mobile resources and pointed out that both of them can result in office syndrome. The pollutant resources must be controlled in order to improve indoor air quality thoroughly. For example, spreading green building designs, employing green decoration materials, installing green ventilation establishments, outfitting green office equipments and furniture, planting green foliages and so on. Considering the actual status of China, it is unpractical to control the pollutant resources in a short time, but to control them step by step is feasible.

3. Control the indoor air pollution using high and new technology.

Indoor air pollution control is a systematic engineering involving building design, indoor decoration, HVAC establishment, office equipments and furniture, and even personnel density. Using part cleaning method to improve indoor air quality is an economical and effective measure because of limited impersonal conditions and technology level at present, for example, outfitting an ozone cleaner for duplicating machine; placing a floor-type office purifier in the offices whose areas are below 20m^2, and placing a cabinet-type office purifier in the offices whose areas are over 25m^2. However, high and new technologies and plentiful investments must be employed so as to improve office air quality radically.

The GREEN OFFICE

Humankind faces a challenge comparable in size with the industrial revolution: to create an ecologically sustainable society. With this challenge ahead, no designer can afford not to consider sustainability in his or her work. With a unique position of power and influence in this development, the designer has a choice: to lead or follow. "You'd better start swimming or you'll sink like a stone", as Bob Dylan put it.

The examples in this book show the work of architects that has risen to the challenge of envisioning energy saving designs and green offices.

I run an architecture office where we work with sustainable architecture on a daily basis. A few years ago we were intrigued to look beyond the projects on the drawing table to envision the future of sustainable architecture. Therefore, we started a think tank called Super Sustainable combining the knowledge of experts from different fields. Together we tried to describe what features that might be common for sustainable architecture in the future. I will give a few examples from this work:

Buildings will need to have large floor-areas in comparison to their enclosing surfaces to achieve energy efficiency. Therefore, compact volumes will be used. With a disperse shape as a starting point, energy efficiency is hard to achieve and will mean diminishing other architectural qualities. A compact volume is equally important with respect to heating and cooling of buildings.

With increasing resource scarcity and the end of fossil fuels, it will no longer be economical or sustainable to transport building materials around the globe. Instead, the architectural palette will consist mostly of locally produced materials.

Materials used should be possible to upcycle or recycle. Therefore, different materials will be clearly divided. Also materials will not be treated, mixed, painted or coated in such a way that they cannot be easily recycled. Hybrid or composite materials will be avoided in favor of single source materials.

如今，人们正面临一个规模上与工业革命不相上下的挑战——创造一个可持续的生态社会。而“能源”，这一在发展中占有独特地位的因素，迫使设计师们做出一个选择：是身先士卒，还是随波逐流？正如“民谣之王”鲍勃·迪伦所说，“不游泳，就会像石头一样沉落谷底。”

书中的案例告诉我们，设计师们已经迎难而上，对节能和绿色办公提出了大胆的预想，并作出相应的实践。

在 Kjellgren Kaminsky Architecture 设计事务所里，我们每天都与可持续建筑打交道。几年前，透过绘图桌，我们对未来可持续建筑也有所展望。最终，集各个领域的专家之所长，我们开始了“超级可持续”这个伟大构想，并尝试着描绘未来可持续建筑的蓝图。以下是我举的几个例子：

与封闭的平面相比，建筑必须腾出大的面积实现高能源效率。因此，压缩建筑结构至关重要，紧凑的建筑结构不仅有助于这一目的的实现，还有利于供暖和制冷。反之，分散的结构不仅使能源得不到很好的利用，还会影响工程质量。

随着资源和化石燃料的日益减少，建筑材料在全球范围内的运输成本增加，许多建筑颜料多在当地取材。

此外，把可升级再造或循环利用的材料用于建筑中，更有利于分类。但这些材料不能是已经处理过的、混杂的、上色的或刷了涂料的。否则，同样不利于回收再利用。可持续建筑还倡导使用单一材料而非混合材料或是合成材料。

KJELLGREN KAMINSKY
ARCHITECTURE

Joakim Kaminsky

Co-founder Architect SAR MSA

Kjellgren Kaminsky 建筑事务所的
创始人及领导者之一

另外，过多地使用玻璃是建筑的一大弊端。在气候偏冷的国家安装大尺寸的玻璃窗会使热量流失；而在气候温热的地区使用过多玻璃，则需要更多的降温设备。随着该领域技术的不断革新，玻璃所带来的能源效率也在日益增强。然而眼下，建筑师们仍需限制玻璃的使用。

在寒冷的国家，为了减少能源的使用，人们对绝缘材料的需求与日俱增。所以，人们流行使用加厚墙壁、加厚屋顶和加厚地板，这无疑对建筑师们来说是机遇与挑战并存的。终于，真空绝缘材料的出现让超薄墙壁成为可能，并逐步取代了加厚墙壁。

现如今，建筑的使用寿命被大大延长，建筑掀起了一股热潮，被越来越多的人重新定义。但资源日益贫乏，热潮终将散去，拆除整栋建筑也只能是权宜之计。建筑师们必须在基础设施和建筑构建完整的情况下，通过研究新方案使城市和建筑丰富多变，不断迎合大众的新需求。

可再生资源丰富了能源的种类。建筑师们通过小规模地开发当地资源来弥补大系统的脆弱，提高能源的运输，使可再生资源变成了“超级持续建筑”的天然组成部分。这既可以与建筑一起完成，也可单独完成。这些可再生资源包括太阳能电池、太阳能板、风力发电站、地热供暖系统等等。

翻看此书，也许你能从书中的例子读到上述绿色办公建筑的某些特点，又或者你得到的更多？

Excessive use of glazed areas in buildings is a problem in most climates. In cold countries too large windows lead to energy loss, in warmer areas the need of cooling arises. The technical development in this field is fast and the energy efficiency of glazing is continuously improving. Nevertheless, for the time being, architects will need to restrict the use of glazing.

In colder countries, the need of insulation will increase in order to reduce energy usage. Today that means using thicker walls, roofs and floors implicating both difficulties and opportunities for the architect. However, new materials such as vacuum insulation are likely to soon change these prerequisites making it possible to produce very thin walls with acceptable insulation values.

As the lifespan of buildings is significantly prolonged, architecture as fashion will be redefined. Trends will come and go, but as resource spareness is increasing, this process can no longer involve the premature replacement of whole buildings. Instead, architects will have to develop new strategies making buildings and cities adaptable and changeable in order to meet the demand for newness while keeping their main infrastructure and building components intact.

Energy will have to be harvested from renewable resources. To reduce the vulnerability of larger systems and to optimize the efficiency in power transmission, we will have to use more locally and small scale resources. Therefore, the harvesting of renewable energy will be a natural part of Super Sustainable Architecture. This can be done as an integrated part of buildings or with freestanding units. The harvesting can be carried out with solar cells, solar panels, wind power plants, geothermal heating systems and so forth.

As a reader, perhaps you will recognize some of these features in the contemporary examples of green office architecture of this publication? Perhaps they will indicate other directions that we have yet to see?

Yingchu Qian
钱颖初

Head of Building Sustainability, Asia
LEED AP, BD+C

亚太区可持续发展首席代表
建筑可持续发展高级顾问

ATKINS

Without a doubt, green building has become a catchphrase in China over recent years – however, its implementation has remained challenging and debatable.

Let us look at it through a few simple questions for architects and designers:

- Q: Is your project a green building?
- A: Of course, low carbon design is the future.

- Q: If your client would like to have a green building, what design features would you suggest?
- A: Perhaps active sun-shading devices, double-skin facade or geo-thermal energy etc.

- Q: Have you been successful in implementing these suggestions?
- A: No, it's too costly.

A green building should be executed with ease, or it remains a stretched idea with little relevance to the reduction of carbon footprint and our current climate conditions. In the current state of condition, much of the green technologies and practice standard has been pre-conceived with political and commercial motivations.

So how do we realize the vision of a green building? The answer could be very simple:

Getting back to common sense – we need to incorporate planning, architecture, structure and building systems with good solid understanding of our geography, climate and cultural history. Green building is not just about accumulation of pure technologies, products and standards. We need to develop awareness about sound, light, heat, and air flow – building sciences play an important role in the shaping of our built environment. While pursuing new scientific development in low carbon technologies, we must not neglect the rudimentary knowledge and common wisdom.

绿色建筑目前在中国无疑很热，但处于一种微妙的境地，很难用“好”或“坏”来进行评判，但挑战是显然存在的。

让我们从几个针对建筑师的问题开始了解这个挑战：

问 1：你设计的建筑是绿色低碳建筑吗？

答案是可想而知的：谁会说不是呢？绿色建筑目前已经成为建筑界的大趋势。

问 2：如果业主想做一栋绿色建筑，你会建议哪些绿色低碳策略呢？

答案还是侃侃而谈：可调节外遮阳、呼吸式幕墙、地源热泵等等。

问 3：最终你完成的项目中有没有用以上的措施呢？

答案：造价太高了，没有。

我们都生活在现实世界中，绿色建筑也须是如此，如不能完成的，充其量只是理念而已，显然不能成为真正的绿色建筑。细细想来，我们会发现在这个物欲和口号的世界中，不经意间，我们的很多舆论、设计标准都被其他利益方所限制了，是“进步”也是“悲哀”。

那么，如何寻回我们自己和充满激情的可以实现的绿色建筑？答案其实很简单。

理性地进行设计，包括规划、建筑、结构、机电等的结合，再深入了解及诠释环境、地理、气候、人文历史，就可以合理的成本及方式来完成绿色建筑——而不纯粹是依靠产品、技术的堆砌。但这需要我们静心、虚心了解身边的世界和环境，这个建筑依存的空间，感受自然的能量：声、光、热、气流。其实这就是建筑物理，了解了它，你才有可能掌握有趣的绿色建筑设计手法，完成现实的、真正的绿色建筑。在追寻先进绿色技术的前沿，我们不能摒弃最基本的知识和实践。

Brief Introduction of Green Building Rating Systems

各国绿色建筑评估体系简介

UK BREEAM

Building Research Establishment
Environmental Assessment Method

英国建筑环境评估方法研究机构

BREEAM 是世界上第一个绿色建筑评估体系，由英国建筑研究所于 1990 年制定。

由于有英国建筑师学会的参与，该证书在英国具有相当的权威性。

BREEAM 体系：涵盖了包括从建筑主体能源到场地生态价值的范围，包括了社会、经济可持续发展的多个方面。

BREEAM 目标：减少建筑物对环境的影响。

BREEAM 评价对象：新建建筑和既有建筑。

BREEAM 评价内容：

1）核心表现因素

2）设计和实施

3）管理和运作

BREEAM is the world's foremost environmental assessment method and rating system for buildings, with 200,000 buildings with certified BREEAM assessment ratings and over a million registered for assessment since it was first launched in 1990.

A certificated BREEAM assessment is delivered by a licensed organisation, using assessors trained under a UKAS accredited competent person scheme, at various stages in a building's life cycle. This provides clients, developers, designers and others with:

- market recognition for low environmental impact buildings,
- confidence that tried and tested environmental practice is incorporated in the building,
- inspiration to find innovative solutions that minimise the environmental impact,
- a benchmark that is higher than regulation,
- a system to help reduce running costs, improve working and living environments,
- a standard that demonstrates progress towards corporate and organisational environmental objectives.

USA LEED

Leadership in Energy & Environmental
Design Building Rating System

能源与环境设计先锋建筑评级系统

LEED 由美国绿色建筑委员会（USGBC）1996 年制定。

LEED 是性能性标准，主要强调建筑在整体、综合性能方面达到“绿化”要求（得到认证的建筑不一定是节能建筑）。

LEED 很少设置硬性指标，各指标间可通过相关调整形成相互补充，以方便使用者根据本地区的技术经济条件建造绿色建筑。

LEED 是自愿采用的评估体系标准。

凡通过 LEED 评估的工程都可获得由美国绿色建筑协会颁发的绿色建筑标识。

LEED 认证级别：（总分 69 分）

1）认证级：26 ~ 32 分
2）银级：33 ~ 38 分
3）金级：39 ~ 51 分
4）白金级：52 分以上

The LEED standards are intended to produce “the world's greenest and best buildings” by giving developers a straightforward checklist of criteria by which the greenness of a building can be judged. Points are awarded in various categories, from energy use (up to 17 points) to water-efficiency (up to five points) to indoor environment quality (up to 15 points); the total then determines the building's LEED rating. Extra points can be earned by installing particular features, such as renewable-energy generators or carbon-dioxide monitoring systems. A building that achieves a score of 39 points earns a “gold” rating; 52 points earns a “platinum” rating. A gold-rated building is estimated to have reduced its environmental impact by 50% compared with an equivalent conventional building, and a platinum-rated building by over 70%.

Brief Introduction of Green Building Rating Systems

Blue Angel

Der Blaue Engel

德国蓝天使奖

The Blue Angel (Der Blaue Engel) is a German certification for products and services that have environmentally friendly aspects. It has been awarded since 1978 by the Jury Umweltzeichen, a group of 13 people from environment and consumer protection groups, industry, unions, trade, media and churches. It is the oldest ecolabel in the world, and it covers some 10, 000 products in some 80 product categories. The Blue Angel is an ecological beacon showing the consumer the way to the ecologically superior product and promotes environmentally conscious consumption.

Blue Angel 是当今世界上最严格的认证之一，创建于1978年，是世界上第一个环境认证。

隶属于德国联邦环保局、自然保护部和核安全部，由联邦环保部门、质量和产品认证委员会（RAL）德国协会共同发起，所有受理产品和服务的技术标准均由独立的环境标志委员会来决定，其认证主要通过文件审核依据标准的检测报告和企业自我声明的形式来进行。

涵盖清洁用品、用具机械、纸质用品、家具、衣服、墙纸、润滑剂、建材等多个领域，是国际上最先行、最被认可、最高级别的环保标志，现已扩展到约80个类别的10000多种产品和服务，在绿色环保标志中占主导地位。拥有它等于拥有了国际市场的绿色通行证。

DGNB

German Sustainable Building Certificate

德国永续建筑认证

The German Sustainable Building Council, which is recognized as an official member of the Green Building Council network, launched Europe's newest green building rating system in 2008.

The German Sustainable Building Certificate has many similar themes as the more well-known LEED, BREEAM and Green Start Systems, but places more emphasis on Life Cycle Analysis of materials and costs, and it treats the building location in a different manner.

The system awards points in six topics:

- Ecological Quality
- Economical Quality
- Socio-cultural and Functional Quality
- Technical Quality
- Quality of the Process

DGNB 是当今世界第二代绿色建筑评估体系，创建于2008年，它由德国可持续建筑委员会组织德国建筑行业的各专业人士共同开发。

DGNB 涵盖了生态、经济、社会三大方面的因素，以及建筑功能和建筑性能评价指标的体系。经济因素包括了建筑生命周期的费用和建筑价值发展的评估；社会文化与功能质量包括健康性、热舒适度和满意度、功能性、设计质量、变革（即创新）和设计程序等方面。

DGNB 评价内容包括：1. 生态质量；2. 经济质量；3. 社会文化及功能质量；4. 技术质量；5. 程序质量；6. 场址选择。

DGNB 评分标准：每个专题分为若干标准，对于每一条标准，都有一个明确的界定办法及相应的分值，最高为10分。

DGNB 评价等级：根据六个专题分值授予金、银、铜三级。

Brief Introduction of Green Building Rating Systems

European Solar Prizes

欧洲太阳能奖

European Solar Prizes 由欧洲太阳能协会（Eurosolar）授予，开始于 1994 年，每年举办一次。协会位于德国波恩。

授予对象：通过各种方式，有效利用可再生能源的组织或个人。

The European Solar Prizes are awarded annually by the European Association for Renewable Energy (EUROSOLAR) located in Bonn, Germany. The Prizes are awarded since 1994 to individuals or organizations for the outstanding contribution to the utilization and applications of renewable energy in all its available forms. All winners of the European Solar Prizes are selected from the entrants for the national Solar Prizes in each country and from the applications directly received at EUROSOLAR Germany.

Japan CASBEE

Comprehensive Assessment System for Building Enviromental Efficiency

日本建筑环境全面评估体系

2001 年，由日本学术界、企业界专家、政府三方面联合组成“建筑综合环境评价委员会”。

CASBEE 评价对象：各种用途、规模的建筑物。

CASBEE 评价原理：根据已有的“生态效率”的概念，从建筑环境效率（BEE）定义出发进行评价，试图评价建筑物在限定的环境性能下，通过措施降低环境负荷的效果。

CASBEE 评价思想：以用地边界和建筑最高点之间的假想空间作为建筑物环境效率评价的封闭体系。

BEE 值的计算方法：参评项目最终的 Q 或 LR 得分为各个子项得分乘以其对应权重系数的结果之和，得出 SQ 与 SLR。SQ / SLR 的比值即为建筑环境效率，比值越高，环境性能越好。

CASBEE is the green building management system in Japan.

Since they started the development of CASBEE in 2001, they have developed the following tools: CASBEE for New Construction, CASBEE for New Construction (Brief version), CASBEE for Existing Building, CASBEE for Existing Building (Brief version), CASBEE for Renovation, CASBEE for Renovation (Brief version), CASBEE for Heat Island, CASBEE for Urban Development, CASBEE for an Urban Area+Buildings, CASBEE for Cities, CASBEE for Home (Detached House), CASBEE for Market Promotion (Tentative version) and CASBEE Property Appraisal.

CASBEE is used to assess buildings based on interior comfort, scenery consideration and environmental awareness (utilize energy saving materials and equipment, or those that cause smaller environmental loads).

Comprehensive assessments ranked in five grades: (C) Poor, (B-) Fairly Poor, (B+) Good, (A) Very Good, (S) Excellent.

Brief Introduction of Green Building Rating Systems

Canada GBTool

Green Building Tool

加拿大绿色建筑评估认证

GBTool was launched in 1996 and culminated in 1998 in GBC 1998. It was developed by Nils Larsson and Raymond Cole on behalf of Natural Resources Canada, iiSBE and the GBC partners.

GBTool is intended to be used for the assessment of potential energy and environmental performance of buildings.

It can handle both new building and renovation projects within the three types of buildings it assesses: multi-unit residential, office and school.

There are four levels of parameters included in the system, including in descending order of generality, Issues, Categories, Criteria and Sub-Criteria. The Issues and Category parameters are voted on by team members in the Vote worksheet, but the two lowest levels are assigned automatically. Scores are multiplied by the weights and the weighted scores are shown in the Results worksheet.

In GBTool, scores are assigned in a range of -2 to +5, where:

- -2 and -1 are levels of performance below the acceptable level in your region, for occupancies specified;
- 0 is the minimum level of acceptable performance in your region for occupancies specified;
- 3 is the Best Practise;
- 5 is the best technically achievable, without consideration of cost.

绿色建筑挑战最初由加拿大发起于 1996 年，当时有美、英、法等 14 个国家参加；各参加国通过对多达 35 个项目进行研究和交流，最终于 1998 年确立 GBTool。

GBTool 评估对象：包括新建和改建翻新建筑。

GBTool 评估手册：包括总论、办公建筑、学校建筑、集合住宅。

GBTool 的指标体系：4 个层次，由 6 大领域、120 多项指标构成，基本上涵盖了建筑、环境评价的各个方面。GBTool 更加注重生命周期的全过程评价。

GBTool 评分标准及等级：

采用 -2 ~ +5 的评分标准；

-2 和 -1 代表低于行业平均水平；

0 代表行业平均水平；

+3 代表行业最好的水平；

+5 代表不考虑成本可以达到的最佳效果。

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GSC

Green Star Certification

澳大利亚绿星认证

目前在澳大利亚的主要评估体系之一。

评价内容：项目管理、室内环境、节能环保、交通运输、建筑材料、辐射量、发明创新以及土地与水资源的利用。

Green Star is a comprehensive, national, voluntary environmental rating system that evaluates the environmental design and construction of buildings and communities.

The Green Star rating tools assess buildings or community projects against a number of categories. These categories allow for a determination to made on the environmental impact of a project's site selection, design, construction, maintenance etc. The nine categories includes: Management, Indoor Environment Quality, Energy, Transport, Water, Materials, Land Use & Ecology, Emissions and Innovation.

GB 50378–2006

Chinese Green Building Assessing Standard

中国绿色建筑评价标准

中国颁布的综合性绿色建筑评价国家标准。

适用范围：新建、扩建与改建的住宅建筑或公共建筑（办公建筑、商场建筑、旅馆建筑）。

评价项目：节能、节地、节水、节材、环境、运营

最终目的：提高绿色建筑技术、推动绿色建筑市场、提高业界与公众的绿色建筑意识。

The Green Building Assessing Standard is the comprehensive criterion issued by China.

Scope of Application: the residences and public buildings which are new constructed, extended or rebuilt.

Assessment Items: energy saving, economizing on land, water and material, environmental protection and enterprise operation.

Ultimate Aim: improving the green building technology, promoting the green building market and strengthening awareness of green building in industry and public.

Madrid IDOM Office

Location: Bilbao, Spain
Completion Year: 2011
Designer: ACXT Arquitectos
Site Area: 14,400 m^2
Client: IDOM

THERMALLY ACTIVE STRUCTURE

The building has an HVAC system which must be considered as an integral part of the building itself (TABS: Thermally Activated Building System). A number of hydraulic circuits are laid out over the concrete slabs, keeping the temperature of the mass of the whole building within values very similar to those of the surrounding environment. There is no thermal stress. There is no noise or temperature difference between areas. It is the first building of its class in Spain which incorporates this technology, which is already being used in central Europe. The adaptation of this system to the Mediterranean climate, and specially to the particular conditions of Spanish construction methods, has proven to be quite a challenge, research wise, which has finally paid off with the construction of this building. The high inertia of the system manages to separate completely in time the demand for energy from its production, granting its clear advantages over traditional systems. The energy accumulated in the structure during the day is freed by overnight evaporative cooling. The efficiency of this method cannot easily be matched by any other.

AIR RENOVATION

Air is renewed in a much calmer way, since temperature is no longer an issue, by means of a shifting textile ducts system. It is a technology that has its origin in the food industry due to its high hygienic and sanitary levels, never before having been applied to an office building project in Spain. Making the most of its clear advantages and researching the system design alongside the manufacturer (KE-Fibertec) to adapt it to its new function, good results have been achieved regarding its salubrity, air quality and comfort, key issues in this type of building. This system contributes a great deal with the energy efficiency factor. The network deals with great flow variations and allows for making the most of favourable exterior conditions to ventilate the interior almost free of charge, without any unnecessary energy consumptions.

NATURAL VENTILATION

The use of a natural ventilation system, without any mechanical aid, has been researched. To that purpose, vertical communication atriums have been planned, working as great HVAC return air collectors, dispensing with conventional return ducts. When natural ventilation starts, the air propulsion machines stop and the atrium continues to work as a return chimney. Only this time it drives the air towards the exterior through the discharge systems at the top of the atriums, while the new air enters through the tilting windows of the offices, which are aimed at the ceiling. Zero consumption and natural ventilation allow the building to work without any other support when exterior conditions are adequate.

Therefore, consumption levels are expected to be so low as to comply with regulations that will follow the new EU Directive on the energy performance of buildings (Directive 2010/31/EU of 19 May 2010), which will come into full effect by 2020.