沪上·生态家导览

2010世博会城市最佳实践区上海案例

SHANGHAI CASE FOR URBAN BEST PRACTICE AREA, EXPO 2010

Eco - Housing
GUIDE BOOK

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副主编 章颖

中国建筑工业出版社

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百年上海
Centennial Shanghai

百年上海，历经沧桑，昔日的小渔村，如今已发展为现代化的国际大都市。

Shanghai has been through glorious years and cloudy times throughout a century. Having experienced lots of great changes, Shanghai is evolving from a fishing village to a thriving international megalopolis.

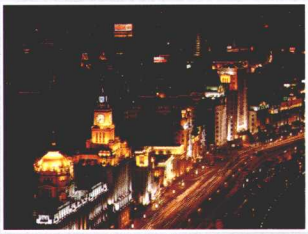
上海位于长江入海口，临海平原，气候适宜，是发展中国家、夏热冬冷气候区、高密度大城市的典型代表。在资源匮乏、能源短缺、污染加剧的情况下，面临着可持续发展的严峻考验。

Shanghai is a coastal plain, located in the estuary of the Yangtze River with a suitable climate.It is a typical representative of developing countries, hot summer and cold winter climate region and high density megalopolis. Shanghai is facing a severe challenge of sustainable development under the circumstances of lack of resources, energy shortages and pollution threat.

1891年的外滩
The Bund (1891)

1930年的外滩
The Bund (1930)

1983年的外滩
The Bund (1983)



21世纪的外滩
The Bund (21st century)

人居变迁
Habitat Changes

住宅，是城市生活的基本空间。上海住宅，几度变迁，承载着人们对美好生活的追求，见证着城市为改善生活质量而作出的不懈努力。

Housing is the basic space of city life. Those changes of shanghai housing reflect people's endless pursuit for happy lives, and demonstrate the city's perpetual effort for life quality improvement.

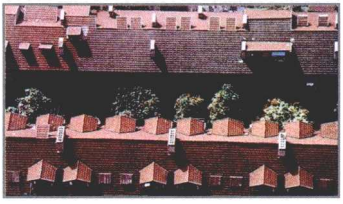
1.上海早期本土住宅——适应江南地区夏热冬冷气候特征的传统民居。

1. The Early Shanghai Folk Dwelling (The traditional housing for adaption to the particular Southern Yangtze River Region climate characteristics of the hot summer and cold winter).

上海早期本土住宅
The Early Shanghai Folk Dwelling

2.上海近代里弄建筑——服务于激增城市人口亦中亦西的居住形态。

2.The Contemporary Shanghai Dwelling (The housing pattern of culture conflicts between the eastern housing and western housing under the circumstances of the continuously and sharply increased urban population) .



上海近代里弄建筑
The Contemporary Shanghai Dwelling

3.上海当代住宅改造——应对发展中城市高消耗、高污染模式下的住宅演进。

3. The Modern Shanghai Housing (The housing evolution of reducing the high consumption and high pollution during developing).

多层住宅平改坡
The roof of Multi-story Housing changed from the flat form into the slope form

老公房节能改造
Energy saving retrofit of old apartment buildings

4.上海生态住宅兴起——代表21世纪城市人居可持续发展的主流实践。

4. The Rise of Shanghai Ecological Housing (The popular practice represented for sustainable development of urban habitat in 21st century).

生态别墅
Ecological Villa

多层生态住宅
Multi-stored Ecological Apartment

高层生态住宅
Ecological Residential High-rise

上海生态建筑示范工程——“沪上·生态家”的母体
(位于上海市申富路568号，于2004年9月起建成开放)

“Shanghai Ecological Demonstration Building” project—the matrix of “Shanghai Eco-Housing”(It is located in No. 568 Shenfu Road, Shanghai, and officially opened since September, 2004)

本案诉求
Ecological Demands

“沪上·生态家”，作为“上海生态住宅”应对“夏热冬冷地区、高密度、大城市”地域特点的最佳实践典范，以“诠释世博主题，展现上海本土特色、成功经验和最高水平，引领未来发展”为使命，以荣获2005年建设部首届绿色建筑创新奖一等奖和2009年住房和城乡建设部首个绿色建筑三星级标识的“上海生态建筑示范楼”为母体，在建筑形态和技术应用上进行传承创新，是代表东道主上海向2010年世博会城市最佳实践区提供的居住建筑实物案例。

As a best practice of ecological building under the circumstances of “hot summer and cold winter region, high density megalopolis”, referring to the “Shanghai Ecological Demonstration Building”(the first building won the first prize of 2005 MOC Green Building Innovation Award and 2009 MOHURD Green Building Operation Label), “Shanghai Eco-Housing” interprets the theme of the Expo, displays the top level in Shanghai, leads the future development, and inherits the innovation ideas on the building form and technology application. On the behalf of Shanghai, it is also the residential practical case exhibited in the Expo UBPA.

沪上·生态家实景图
Eco-Housing

理念解读
Idea Analysis

“沪上·生态家”遵循“天和——节能减排、环境共生，地和——因地制宜、本土特色，人和——以人为本、健康舒适，乐活——健康可持续的价值导向”的定位目标，采用因地制宜的设计原则和自主创新的关键技术，集上海和国内外之大成，在方案的策划和设计中践行了“生态建造，乐活人生”的全新生态居住理念。

Integrating local design and innovative technologies, “Shanghai Eco-Housing” follows the ideas of energy conservation, emission reduction, environmental protection, human orientation and LOHAS.

本土设计
Native Design

“沪上·生态家”建筑设计充分汲取江南民居的传统精髓，以白墙、灰砖、黄瓦为主色调，以山墙、里弄、老虎窗等为上海住宅要素符号，以“风、光、影、绿”等本土生态手法传承和演绎为重中之重，通过老虎窗和楼梯天井设计强化自然通风采光，外挑屋檐设计满足遮阳避雨功能，景观水体生态保持使得滨水而居却流水不腐，而南阳台模块绿化墙、西墙爬藤绿化、中庭风笼垂挂植物绿化、屋顶花园绿化等无处不在的生态绿化立体配置，使整个建筑物处处草木葱郁，融入绿色盎然之中，充分体现了生态家自然和谐的居住理想。

The architectural design of “Shanghai Eco-Housing” fully inherits the essence of traditional southern dwellings.

- Hue and Material: white wall, grey brick, yellow tile.
- Traditional Native Design: gable, lanes and alleys, dormer, etc.
- Ecological Elements: Wind, Light, Shadow, Green.

Ecological Technologies Application:

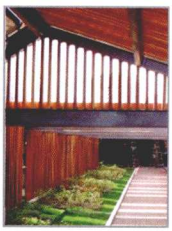
- Dormer provides natural ventilation.
- Stair patio provides natural lighting.
- Overhanging eaves provides sun shade and rain shade.
- The landscaping pond keeps the water fresh.
- All the ecological green fully display the idea of “Nature and Harmony”.

白墙灰砖、滨水而居
White Brick and Grey Brick Near the Water

石库门意向
Shikumen Design

老虎窗
Dormer

中庭风笼
Atrium



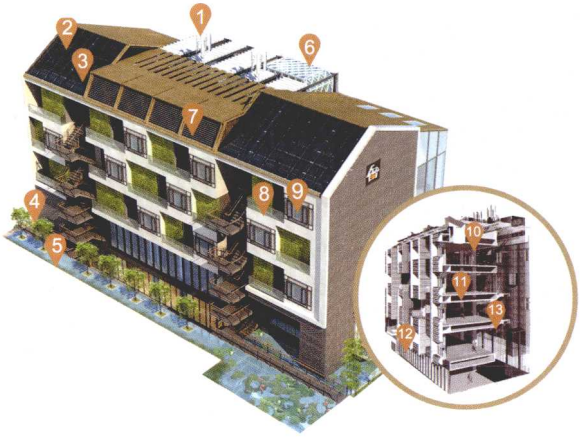
屋顶花园
Roof Garden

“沪上·生态家”建筑本身便是一个满足我国绿色建筑三星级最高要求的实物展品，通过各种最新科技产品的建筑一体化应用，向我们展示了打造“节能低碳、固废再生、环境宜居、智能便捷”生态家园的技术亮点。

“Shanghai Eco-Housing” is a three-star green building in China.

Advantages:

- Energy Conservation and Low Carbon.
- Solid Waste Recycling.
- Environment-Friendly.
- Intelligent and Convenient.



1.屋面小型风力发电
Wind Power Generation

2.非晶硅薄膜太阳能发电
Solar PV Generation

3.平板集热太阳能热水
Solar Heat Water

4. LED夜景照明
LED Landscape lighting

5.生态浮岛景观水池
Landscape Pond

6.中庭强化自然通风
Natural Ventilation

7.老虎窗天然采光
Natural Lighting

8.南阳台挂壁式模块绿化
Wall-Hanging Modular Green

9.双层窗夹遮阳帘系统
Double Glazing Sun Shading System

10.能量回馈节能电梯
Energy Recovery Elevator

11.隔热保温调温调湿墙体
Heat Insulation Wall

12.再生骨料绿色混凝土
Renewable Aggregate and Green Concrete

13.固废再生内隔墙
Waste Reutilization Partition Wall

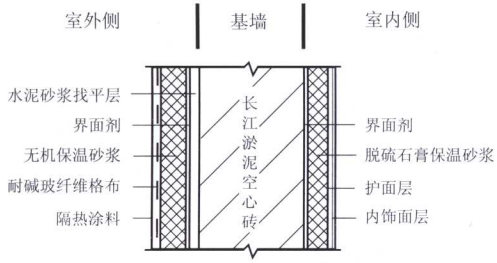
“沪上·生态家”技术亮点
Highlights of “Shanghai Eco-Housing”

1. 气候适应性节能围护结构——冬暖夏凉的建筑外衣

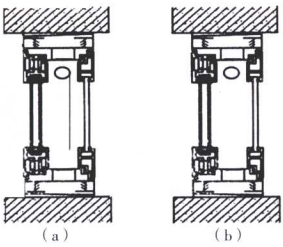
- 墙体：内墙用电厂废料脱硫石膏制成的板调节室内的温湿度，中间填充长江淤泥制成的砖，外包无机保温砂浆和隔热涂料（或隔热砂浆），给整个建筑穿上了冬暖夏凉的建筑外衣。
- 外窗：采用内外都可以打开或关闭的双层窗、中间内置可收放的遮阳卷帘，具有良好的节能效果和通风换气、采光、隔声综合性能，成为家庭窗户节能改造的样板。

1. Climate-adaptive energy saving building envelope — a building coat for warm winter and cool summer area

- Walls: Waste gypsum boards made for interior walls are used to control the indoor temperature. The Yangtze silt bricks in the middle, together with inorganic thermal insulation mortar on the façade and heat insulation coating (or insulation mortar), give the entire building a warm winter and cool summer coat.
- Exterior windows: As a model of energy saving retrofit, both sides of double-windows can be opened and closed. The sun shade curtains in the middle have not only a good energy saving effect but also a comprehensive performance including ventilation, lighting and sound insulation.



墙体保温结构
Wall Insulation Structure



双层窗系统
Double-window System

2. 固废再生绿色建材——变废为宝的建筑材料

- 含废弃料高达60%以上的混凝土：将旧房拆除的建筑垃圾打碎后代替粗石料，用矿渣、粉煤灰等工业废料代替部分水泥生产的节能环保型绿色混凝土。
- 100%采用固废再生建材的内隔墙：利用废纸制成的保温纸芯隔墙、利用生活垃圾制成的砌块等。
- 装饰装修材料的固废再利用：采用废弃型钢焊接加工成中庭风笼钢结构，用约15万块老石库门砖砌筑建筑立面，铺砌楼梯踏面等。

2. Solid waste recycling green building materials — a technology can change waste into treature

- 60% of the high performance recycling aggregate concrete comes from waste: after old buildings were demolished, the building waste broken into pieces takes the place of rough stones. Slag and fly ash take the place of cements. Those waste materials are changed into energy-saving and environmental-friendly green concrete.
- The interior partition wall uses the recycling waste as building materials in 100%: Waste paper is used for heat insulation partition wall. Garbage is used for blocks.
- The decoration materials adopt the solid waste recycling technology: The steel cage structure of atrium is made by waste steel welding and processing technology. Walls and stairs of the Eco-Housing are made from about 150,000 old Shikumen bricks.

打碎后再利用的建筑垃圾
Recycle Building Waste

用旧砖铺砌的楼梯踏面
Old Bricks Used For Stairs

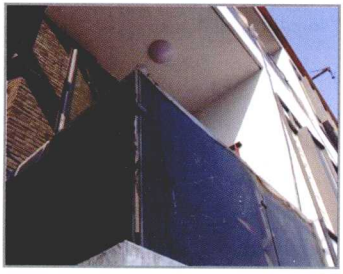
3. 非晶硅薄膜BIPV系统——更适合上海气候的太阳能发电

在建筑的屋顶和阳台上，采用了更易与建筑一体化贴合的非晶硅薄膜太阳能发电系统。与以往常见的单晶或多晶硅太阳能发电系统不同，它不需很强的阳光，只要有光线透过就能发电，特别适合太阳能资源不够丰富的上海地区。

3. Amorphous silicon film BIPV system — a more suitable solar generation system to the climate in Shanghai

The BIPV amorphous silicon film solar PV system is used on the roof and balcony. Compare to the monocrystalline silicon type and polycrystalline silicon type, it can generate the electricity even in cloudy days, which is more suitable to the places lack of solar energy, especially Shanghai.

屋顶上的太阳能发电系统
Solar PV Generation (Roof)



阳台上的太阳能发电系统
Solar PV Generation (Balcony)

4. 小型垂直轴风力发电机——屋顶上竖起来的发电大风车

这种新型的风力发电机，微风时就能启动发电，置于屋顶的钢屋架上，噪声小、寿命长、效率高，成为绿色建筑的标志性元素之一。

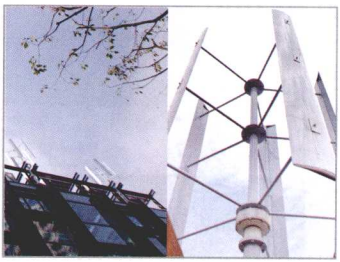
4. Small vertical-axis wind turbines — a large vertical windmill on the roof

The new type wind turbines set on the roof can generate electricity when the wind passes.

Advantages:

- Less Noise.
- Long Working Lifecycle.
- High Efficiency.

Those wind turbines have become one of the symbolizing elements of green building.



屋顶小型垂直轴风力发电机
Small Vertical-axis
Wind Turbines on the Roof

5. 平板集热太阳能热水系统——会隐身的太阳能热水器

跟建筑屋架完美“隐身”结合的平板集热太阳能热水器，寿命长、效率高，不仅为整楼提供50%的生活热水量，还可有效消除太阳能板带来的“光污染”问题。

5. Flat heat collector solar heat water system — an invisible solar water heater

The “invisible” flat heat collector solar water system set on the roof is perfect integrated with the entire building design, to provide the building 50% of hot water needed.

Advantages:

- Long Working Lifecycle.
- High Efficiency.
- Elimination of Light Pollution.

屋架平板集热太阳能热水系统
Solar Heat Water System

6. 能量回馈电梯——上上下下中的能发电电梯

采用了“能量回馈技术”的电梯，在上下运行过程中，多余势能和动能会转化成电能向电梯控制系统反馈，通过轿厢内置的实时监测视窗，可清晰地看到其节能30%以上的效果。

6. Energy Recovery Elevator — an elevator can generate electricity during working

The “Energy Recovery Technology” is used on all the elevators.

Principles:

- They can convert the excess potential energy and kinetic energy into electrical energy.
- The electrical energy can be fed back to the elevator control system.

Effects: Those energy recovery elevators can save the energy over 30%.

能量回馈电梯
Energy Recovery Elevator

能量回馈实时监测视窗
Energy Feedback Real-Time Monitoring System

7. 生态浮床水体净化——一流水不腐的自洁景观水池

将生态浮床与地下室景观水池巧妙地结合在一起，利用植物净化收集到的屋面雨水补给景观用水，并在水景池里种植同时具有净水和景观功能的水生植物，让滨水而居却流水不腐，了却了居家的后顾之忧。

7. Water purification from the ecological floating beds — an automatic cleaning pond with fresh water

Principle:

- By using the plant purification technology, the ecological floating beds and the basement landscaping pond are integrated to purify the rainwater having been collected from the building.
- All the aquatic plants have the advantages of water purification and landscaping.

地下室景观水池水生植物
Underground Landscaping Pond

8. 墙面垂直绿化——可随时更换的绿衣服

南侧阳台墙面采用挂壁式种植模块绿化，植物在环保型纸花盆中定型培养，具有安全美观、节能生态、随调随配、成景迅速及养管简便等优势。西侧墙面为防强烈的西晒阳光，种植爬山虎等来隔热降温。

8. The vertical green wall — a diverse green clothes

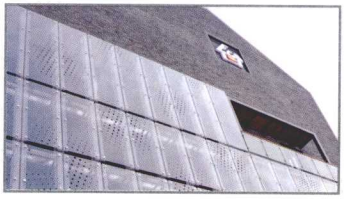
The wall-hanging modular plants are decorated inside the walls of the south balcony. All the plants are living inside the environmental-friendly pots.

Advantages:

- Safe and Beautiful.
- Energy Conservation.
- Ecological.
- Easy for Change, Decoration and Maintenance.

Lots of plants such as ivy are decorated on the west walls for heat insulation.

南侧阳台墙面挂壁式模块绿化
Wall-hanging Modular Plant on the South Balcony



西侧墙爬藤绿化
Ivy on the West Walls

9. LED室内外照明——营造节能多彩居家环境

采用新一代LED光源用于室外夜景照明、室内公共区域背景照明以及局部功能性照明，兼具节能高效、色彩斑斓特性，营造环保宜居多姿氛围。

9. LED lighting — a diverse living atmosphere

LED lighting is used for outdoor night lighting, public indoor background lighting, and partial function lighting, with the characteristics of energy conservation, high efficiency and environmentally-friendly living.

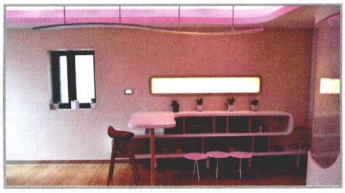
Functions:

- Outdoor Night Lighting.
- Indoor Background Lighting for Public Area.
- Regional Functional Lighting.

Advantages:

- Energy Conservation.
- High Efficiency.
- Gorgeous.
- Environmental-friendly.
- Harmonious.

LED外立面夜景照明
Outdoor Night Lighting



室内节能多彩照明
Indoor Background Lighting

10. 智能监控管理系统——智能管家让生活节约又舒适

由设备管理中心、能源管理中心、环境监控中心、信息展示中心组成的智能管家，通过对能源和环境的监控，协调管理各种自动化设备的运行，在保证人体健康舒适的情况下实现能耗最小化。

10. Intelligent Monitoring Management System — a comfortable and economy life

The equipment management center, energy management center, environment monitoring center, information display center constitute the "intelligent steward".

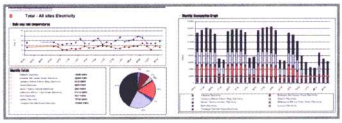
Functions:

- Monitor the energy consumption.
- Monitor the environment.
- Run the automatic equipment.
- Secure the human health.

Advantages:

- Low energy consumption.

集成平台画面
Integration Platform



能源分析图表
Energy Analysis Chart