

## 2013 ISOCARP Awards for Excellence

# Post Shanghai Expo - Urban Best Practices Area (UBPA): Low Carbon Ecological Plan and Implementation Guidelines

### Summary

**“Value what is there, nurture what is possible, and deliver what is missing.”**

The “*Post Shanghai Expo Urban Best Practices Area (UBPA): Low Carbon Ecological Plan and Implementation Guidelines*” (the Project) covers part of the former 2010 Shanghai World Expo site in the City of Shanghai. It is the low carbon implementation plan for an urban redevelopment site covers the former Urban Best Practices Area (UBPA) located at the western part of the original expo site. It has an area of 15.08 ha and a planned building GFA of 240,299 sq. m.

The planning objective is to prepare low carbon and ecological planning guidelines for the 15.08 ha site which will become a new business neighborhood in the heart of Shanghai. The UBPA will provide spaces for new offices, retails, museum and galleries, restaurants, exhibition and convention facilities, with a specific focus to promote the creative and design industries in Shanghai.

The Project demonstrates, at a neighborhood scale, an evolving model of planning practice: **transforming the city by means of an urban redevelopment plan that is implemented based on a low carbon and ecological planning framework.**

The Project has adopted three interrelated planning objectives:

- Continue the low carbon legacy of the 2010 Shanghai World Expo event
- Set up low carbon and ecological performance indicators and implement them through site development guidelines
- Refine the plan to meet international standards for the Leadership in Energy & Environmental Design Neighborhood Development (LEED - ND) Programme.

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### Post Shanghai Expo - Urban Best Practices Area (UBPA):

### Low Carbon Ecological Plan and Implementation Guidelines

#### *Project description*

#### **A. Frontier of Planning: Transforming Cities Through Low Carbon Urban Regeneration**

At the forefront of planning today is the challenge on how to manage urban growth through adopting innovative solutions based on low carbon and ecological principles. Cities can then accommodate anticipated growth and in doing so make themselves a more enjoyable and sustainable place for the people. This frontier in city planning encompasses various interlinking elements that need to be weaved into an integrated planning approach including:

- Energy efficient buildings and local renewable energy production
- Urban ecological resources management
- Public participation in planning decisions
- On-going Community and business partnership engagement

These elements are the driving planning practices in the *“Post Shanghai Expo - Urban Best Practices Area (UBPA): Low Carbon Ecological Plan and Implementation Guidelines”* (the Project).

#### **B. Project Summary**

##### **Project Background and Location:**

The former 2010 Shanghai Expo site (5.28 sq.km.) has been designated by the City of Shanghai as an urban regeneration project which will create at the heart of Shanghai a new urban business, leisure and exhibition Centre. Phase One of this ambitious redevelopment project covers the former Urban Best Practices Area (UBPA) located at the western part of the expo site (Figures 1, 2).

During the 2010 Shanghai World Expo, the UBPA was a collection of international best practices building project examples forming an important component of the 2010 Shanghai World Expo with the theme “Better Cities, Better Lives”. See UBPA location plans, layout plan and illustrative perspective during Shanghai Expo 2010 at:

[http://www.china.org.cn/travel/expo2010shanghai/2009-03/11/content\\_17425019.htm](http://www.china.org.cn/travel/expo2010shanghai/2009-03/11/content_17425019.htm)

[http://www.china.org.cn/travel/expo2010shanghai/2009-03/11/content\\_17425052.htm](http://www.china.org.cn/travel/expo2010shanghai/2009-03/11/content_17425052.htm)

[http://www.china.org.cn/travel/expo2010shanghai/2009-03/11/content\\_17425107.htm](http://www.china.org.cn/travel/expo2010shanghai/2009-03/11/content_17425107.htm)

The City of Shanghai Government has set up the Expo Shanghai Group which now owns all the land within the Expo site. The Expo Shanghai Group is also tasked to plan, construct, manage the site either through itself directly or land leases to other developers. In early 2012, the Expo Shanghai Group commissioned Arup to prepare the Low Carbon and Ecological Plan and Implementation Guidelines for the UBPA.

Arup led and prepared the low carbon ecological plan as a follow on project from the “Shanghai Expo UBPA Construction Detailed Plan” (which was an earlier and separate project undertaken by the University of Tongji, Shanghai).

### **Planned Land Uses:**

The current UBPA land use proposal is to redevelop the 15.08 ha site into a new waterfront business neighborhood in the central area of Shanghai, based on low carbon and ecological planning practices. The UBPA will provide spaces for new offices, retails, museum and galleries, restaurants, exhibition and convention facilities, with a specific focus to promote the creative and design industries in Shanghai (Figure 3).

**Planning Area / Building GFA:** 15.08 ha / 240,299 sq. m.

### **Project Deliverables:**

1. Prepare a low carbon ecological urban strategy for the site
2. Establish low carbon ecological performance standards into all individual land lease contracts for developers and future business operators
3. Prepare a site specific implementation plan
4. Undertake public consultation and community engagement in the planning process
5. Refine the implementation plan to meet international standards for the Leadership in Energy & Environmental Design Neighborhood Development (LEED - ND) Programme.
6. Participate in the monitoring of the subsequent design and construction processes to ensure compliance with the standards (Figure 4).

## C. Project Contents Descriptions:

### 1. Low Carbon Ecological Urban Regeneration Strategy at Neighborhood Scale

#### 1.1 Continue the low carbon legacy of the 2010 Shanghai World Expo event

The site was originally a waterfront industrial area of ship repairs and manufacturing built in the early 20<sup>th</sup> century. During the 2010 World Expo, based on the low carbon objectives of the event, clusters of old industrial buildings and new pavilions from around the world were used as demonstrators of different latest sustainable building technologies. These demonstration technologies were grouped under the 5 categories of Renewable Energy/New Energy; Energy Saving; Low Carbon Transport; Water Management; and Waste Management (Figure 5a).

The Project has proposed to maintain this legacy of sustainability in the Expo event. Based on detailed assessment, Selected sustainability building technologies have been recommended to be retained in the buildings within the UBPA. This strategy has further strengthened the continuation of the “Better Cities, Better Lives” legacy at the heart of Shanghai (Figure 5b).

#### 1.2 Energy retrofitting of existing buildings

“*Making use what we already have to accommodate our urban growth*” is one of the driving principles of the plan. Energy retrofitting for existing buildings is a central planning practice for the future use of the UBPA. The Project includes a total of 23 building sites (the original Nan Shi power plant and 22 buildings) for commercial uses. Out of the 240,299 sq. m. of total planned commercial building GFA for the project, 134,349 sq. m. (56% of the total GFA) are retrofit of existing buildings and only 105,950 sq. m. will be new construction. The plan is further refined to identify different energy retrofitting approaches and standards for 3 groups of buildings: (a) buildings which will only need very minor fitting out works; (b) buildings which will only be allowed to have interior modifications; and (c) buildings which can apply for permissions to undertake exterior modifications based on approved plans (Figure 6). Details of the energy standards are further explained below.

#### 1.3 Sustainability and Low Carbon Performance Indicators

The Project has established a set of 19 performance indicators (Figures 7a, 7b) for the design and construction of the overall site. It is emphasized that these indicators must be simple and easy to understand by the future stakeholders (the developers, the designers, as well as the future users and businesses operators) in order for them to be effectively achieved.

From a overall neighborhood perspective, selected key performance standards incorporated into the plan include: Accessibility to public transit stops within 500m; Green transport modal choices (Non-private) at 50%; 100% of the waste generated by the Project is to be classified for re-use or re-cycling; and 50% of all construction waste should be re-cycled..

Seven of the most important performance requirements to be incorporated into individual land leases for individual buildings and site landscape works are:

- a. **New building energy saving:** The new construction should achieve a 60% reduction from the baseline building energy consumption level in Shanghai. This represents a 20% further reduction from the latest statutory Building Energy Efficiency Codes in China.
- b. **Existing building retrofit energy saving:** Retrofits should achieve a 55% reduction from the baseline building energy consumption level in Shanghai.
- c. **Green Building certification:** All buildings must receive certification as Green Buildings under the China Green Building Evaluation System (which came into effect in 2008).
- d. **Utilization of renewable energy:** A minimum 20% of the energy consumption by all the buildings should be from renewable sources. This is to be achieved by building integrated solar energy production, solar hot water, water source heat pump air conditioning, and the use of limited wind power (Figures 8a, 8b).
- e. **Utilization of non-conventional water resources:** A minimum 15% of the water usage by the Project should be from non-conventional sources as rain water or recycled water for washroom and non-drinking uses. This is to be achieved by putting up on-site water recycling facilities to produce more than 86,000 m<sup>3</sup> of recycled water per year (Figure 9). The Project actually could recycle more than required recycled water and has the capability to supply the extra amount for other municipal uses beyond the Project boundary.
- f. **Rainwater infiltration and harvesting:** A minimum 85% of the rain water each year should be harvested either through on-site infiltration or reuse as irrigation water for the open space and public plaza/ landscape areas (total 33,750 m<sup>3</sup> per year) (Figure 10).
- g. **Urban woodland:** The overall site landscape design and management plan should achieve at the least 40% urban woodland ratio (area planted with native tree species) (Figure 11).

These performance indicators are not just conceptual goals but are specific contractual conditions written into the land lease agreements when individual sites are disposed to developers or leased to business operators. Moreover, a comprehensive monitoring programme has been set up throughout the design approval, construction management, and operation stages of the Project to ensure their implementation in a sustainable manner (Figure 12).

## 2. Public Participation and Operational Phase Stakeholder Engagement

A plan cannot be sustainable without two key processes: public participation at the planning and design phase, and also continuous stakeholder engagement over the operational phase of the project.

### 2.1 Public Participation in Design and Planning Phase

The post Shanghai Expo development planning process commenced in 2011. A series of stakeholders' participation meetings and events have been held to obtain the opinions and ideas from the community.

In August 2012 the proposed development plan for the UBPA were presented to a panel of professionals and experts for comments and discussions. The meeting was also attended by the local municipal authorities and neighborhood management committee representatives.

Comments from the experts were considered and changes to the plan were undertaken.

The revised proposals were then presented to the public and community representatives through community meeting for inputs and suggestions. Public notice was advertised to all the residents nearby. The community meeting was held in January 2013 when the detailed contents of the redevelopment plan, the sustainability and low carbon performance standards, and the implementation plans were discussed. The community opinions were received and also later reported in press (Figures 13a,13b).

## 2.2 On-going Stakeholders Engagement at Operation Phase

As part of the low carbon planning process, the Project Team has also suggested to set up operational/management phase performance indicators. These operational/management phase indicators have introduced a framework of stakeholders' engagement during the operational phase for the Project. This will ensure that the users, business operators and the public will champion and support the low carbon urban regeneration initiatives. These include 4 entities working together:

- **For the Expo Shanghai Group** (the Overall Land Owner): Implement the low carbon ecological design standards throughout the different development stages of the Project; Enforce these standards in all land leases; Set up energy usage efficiency monitoring system for the Project; Set up carbon emission monitoring targets for the overall site; Set up a comprehensive low carbon city education programmes using the public open spaces for the public at large (events, demo sites, promotion and publicity).
- **For the Business Operators and Tenants:** Enterprises will set up employees' best practices and guidelines on low carbon business behaviors. Larger enterprises will issue annual carbon emission reports; Organize green incentive schemes such as car clubs and potential fare incentives for employees within the site.
- **For the public and adjacent communities:** Participate in the education and promotion programmes, join volunteer activities to support low or zero carbon charters, and adopt low carbon living styles.

## 3. Greenhouse Gas Inventory at Neighborhood Level and Exploring Carbon Credit Incentives

One key element in the UBPA Low Carbon Urban Regeneration Implementation Plan is the setting up of an inventory of greenhouse gases (GHG) at the neighborhood scale. This is a pilot initiative first undertaken in the UBPA, and will later lead to a wider application for the 5.28 sq. km Expo site.

A system of measuring the GHG emissions arising out of the activities within the Project has been set up based on the quantified activities data (building types/ uses/ GFA; building energy consumption levels; usage level of renewable energy; public transit mode ridership, water consumption (portable water/recycled water/rain water); urban woodland carbon sink capacity); and waste recycling and

disposals). Based on emission factors in Shanghai for these activities the GHG inventory can be set up (Figure 14).

The Project also explores the setting up of a potential carbon credit incentive scheme. The scheme identifies target emission limits for each of the buildings, and then encourages the developers and users to perform beyond the limits. Any 'overshooting' (reducing more emissions than the targets) could receive financial incentives. Moreover, this initial trial scheme may pave the road towards linking up with the potential future carbon trading arrangements for buildings in the City of Shanghai (a policy which is being studied and pilot tested by the government at present).

#### **4. International Recognition**

The Project has very recently been accredited by the United State Green Building Council (USGBC) for the Leadership in Energy & Environmental Design Neighborhood Development (LEED - ND) Programme at 'Platinum' level. Out of the currently accredited 100 LEED ND projects globally, this is the first Platinum accreditation outside of North America. The integrated sustainable and low carbon development strategies of the Project are recognized by the USGBC as leading example in sustainable neighborhood development internationally (Figure 15). Further details of this accreditation can be seen at:

[http://www.arup.com/Projects/Shanghai\\_Expo\\_UBPA\\_redevelopment.aspx](http://www.arup.com/Projects/Shanghai_Expo_UBPA_redevelopment.aspx)

#### **D. Construction Already in Progress**

The photographs attached (Site Photographs A, B and C) are taken recently during the construction of the Project. The Project is currently under construction and in fact some buildings have just been opened for business. It is anticipated that the UBPA will be completed in 2015.

This is an example of how planners can take on a vision and an evolving planning model, through concept to implementation and realization.



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#### *Analysis of content, process, innovation and sustainability*

#### 1. Contents

"Value what is there, nurture what is possible, and deliver what is missing".

*The Post Shanghai Expo Urban Best Practices Area (UBPA): Low Carbon Ecological Plan and Implementation Guidelines* Project emphasizes a planning approach which is today very much at the forefront of the planning practices globally: **transforming the city by means of an urban redevelopment plan that is implemented based on a low carbon and ecological planning framework.**

This Project represents a genuine and wholehearted attempt though adopting the above evolving model. It has focused on the following driving principles and processes at the neighborhood planning level: Continuation of the low carbon legacy of the site; Energy retrofitting of existing buildings; Implementation of sustainability and low carbon performance indicators; Public participation in planning process and operational phase stakeholders engagement.

A comprehensive set of 19 performance indicators have been set up and implemented. These targets have incorporated low carbon and ecological objectives into the site as a whole as well as for individual buildings. Moreover, they have already been implemented throughout the design approval, construction management, and operation stages of the Project to ensure their implementation in a sustainable manner.

#### 2. Process

This Project also initiates specific planning and implementation programmes with the strong professional belief that the planner's roles in city building must go beyond plan preparation phase into implementation, performance monitoring, and on-going community and businesses engagement processes.

The planners have continued to participate in the design approval and construction phase of the project to ensure that the international accreditation standard (Leadership in Energy & Environmental Design Neighborhood Development (LEED - ND) Platinum Level) will be met.

The Project has also identified a set of operational/management phase performance requirements as a framework for stakeholder engagement programme to ensure the on-going involvement of the 4 key stakeholder groups (the Land Owner, Developers, Business Operators and Tenants, the Public and Adjacent Communities).



### 3. Innovations

The Project has developed and implemented specific innovative planning tools and systems unprecedented in any other planning projects in China. These initiatives represent planning innovations implemented through an urban redevelopment plan, and will serve as best practices and pilots for the development of wider new planning policies both at the city and the national levels:

- A set of low carbon performance requirements included in land lease contracts and tenancy contracts
- Neighborhood scale GHG inventory measurement system
- Developer and Enterprises energy efficiency and carbon emissions monitoring systems
- Business operators carbon incentives programmes
- Employees low carbon best practices guidelines
- Public Low Carbon education programme through open space design and events

### 4. Project Sustainability

This Project has demonstrated a long term engagement and partnership between all the stakeholders to ensure its sustainability as an innovative planning initiative. The framework to maintain the project sustainability includes:

- The overall land owner (the Expo Shanghai Group) is a company set up by the government of Shanghai with a clear “city building” objective beyond commercial interests. While the Expo Shanghai Group operates on sound commercial principles, its mandate on continuing the legacy of the Expo them “Better Cities, Better Lives” is clear and central. This will make sure adequate attention and resources will be allocated to generate innovative ideas, explore the frontiers in urban redevelopment, taking sustainability as the fore value for the Project, and
- At a project implementation perspective, it should be noted that the low carbon and sustainability performance requirements for the individual sites are not simply conceptual goals but are specific contractual conditions written into the land lease agreements when individual sites are disposed to developers of leased to users. Their compliance is ensured legally and also administratively.
- The Project has also taken into account the participation and the engagement by the developers, business operators, tenants, public and adjacent communities throughout the planning, construction, and operational phases of the Project.

In fact the Project has gone beyond the planning and design phase as at the date of this submission. Part of the Project has already been constructed and some buildings have been retrofitted for re-use. Retail and leisure activities have started to be in operation. The step-by-step realization of the Project before the eyes of the adjacent communities and the public has strengthened the belief on the practicality of the redevelopment plan (Figure 12).

**End**