

# TEN KEY PRINCIPLES OF LOW CARBON URBANIZATION

SUPPORTING CHINA'S  
NEW TYPE OF URBANIZATION



A CITY COMES INTO  
BEING FOR THE SAKE  
OF LIFE, BUT EXISTS  
FOR THE SAKE OF  
LIVING WELL."

Aristotle

The following organizations jointly recommend these principles (in alphabetical order):

- China Association for NGO Cooperation (CANGO)
- China Business Council for Sustainable Development (CBCSD)
- CDP
- US-China Energy Cooperation Program (ECP) and its members
- Environmental Defense Fund (EDF)
- Energy Foundation (EFC)
- Eco Forum Global (EFG)
- Innovation Center for Energy and Transportation (iCET)
- International City/County Management Association (ICMA)
- International City/County Management Association (ICMA) China Center
- Innovative Green Development Program (iGDP)
- Institute for Sustainable Communities (ISC)
- Institute for Transportation & Development Policy (ITDP)
- Natural Resources Defense Council (NRDC)
- Oak Foundation
- The Eco Sequestration Trust (TEST)
- United Nations Development Programme China (UNDP China)
- World Resources Institute (WRI)
- World Wide Fund for Nature (WWF)

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## INTRODUCTION

China's rapid urbanization over the past thirty five years has boosted economic development, brought about fundamental social change, and helped to raise the living standards of both urban and rural populations. These achievements have been recognized worldwide. However, this process has also been characterized by intensive resource consumption and an emphasis on speed rather than quality of urbanization, which have negatively affected China's natural environment. Going forward, China's urban development must adopt a greener and low-carbon approach that is focused on efficient uses of land, energy, and other resources.

The Chinese government has recognized the need to ensure the quality of urbanization. In April 2014, it released an important document, entitled *National Plan on New Type of Urbanization (2014-2020)*, putting forward several basic guiding principles. These principles are as follows: carry out human-centered and equitable urban development; optimize city layout with emphasis on compactness and efficiency; pursue "ecological civilization" and green and low-carbon growth; and preserve cultural heritage and local characteristics.

It is exciting and encouraging to note that many Chinese cities have responded to the central government's call by announcing their green development visions and goals, and by carrying out pilot projects on new concepts, such as Eco-City, Low-Carbon City, Livable City, Smart City, and Healthy City. However, there are sometimes discrepancies between the grand vision and the actual practice due to inadequate understanding of the core content of low-carbon urbanization.

Recognizing the gaps in implementing low-carbon strategies and drawing on both international and Chinese experiences, we, 19 non-profit organizations, jointly recommend ten key principles of low-carbon urbanization for Chinese cities. These principles fall into three categories: Low-Carbon Urban Form, Resource Efficiency, and Inclusive Urban Governance. We believe that most Chinese cities have already resolved to take a green development approach that stresses rational spatial layout, green transport, low-carbon industry, renewable energy, and good governance, among other things. Therefore, we do not need to repeat the widely known high-level principles of sustainable urban development or to present an exhaustive list. Instead, we have identified specific principles that address the most important and pervasive weak points observed in Chinese cities. At the same time, these recommended principles are essential in their own rights and are indispensable features of a truly low-carbon city.

To support and facilitate China's low-carbon urbanization, we will advocate the adoption of these ten principles by cities and assist them in putting the principles into practice through our collaborative and individual initiatives.



# 10 KEY PRINCIPLES OF LOW CARBON URBANIZATION



## LOW CARBON URBAN FORM

### **PRINCIPLE 1:**

Prioritize land use efficiency in both new town development and urban renewal through compact, efficient, mixed-use and functionally balanced urban design.

### **PRINCIPLE 2:**

Develop non-motorized transport as a major component of public transportation, integrating walking, biking and public transit into one transport system.

### **PRINCIPLE 3:**

Reduce private vehicle use through improved urban layout, efficient public transport networks, and transport demand management.

### **PRINCIPLE 4:**

Create and maintain more quality public spaces for the general public that are easily accessible, functional, and environmentally friendly.

## RESOURCE EFFICIENCY

### **PRINCIPLE 5:**

Pay equal attention to process management and technology upgrading, when striving for energy and resource efficiency in the industrial and commercial sectors; pursue industrial symbiosis and the "circular economy."

### **PRINCIPLE 6:**

Keep in mind the energy and environmental performance of building operations when promoting building energy efficiency and green buildings.

### **PRINCIPLE 7:**

View municipal waste as a resource by improving waste recycling and implementing waste minimization mechanisms.

### **PRINCIPLE 8:**

Expand the scope of reclaimed water use and select low-impact nature-based methods to restore and improve urban ecological water cycles.

## INCLUSIVE URBAN GOVERNANCE

### **PRINCIPLE 9:**

Transition from "city management" to "city governance" with emphasis on fostering low-carbon communities through information transparency, public participation, and multi-stakeholder governance.

### **PRINCIPLE 10:**

Establish clear socio-environmental thresholds and assessment mechanisms for urban infrastructure investments and financing to support green and low-carbon development

# LOW CARBON URBAN FORM





## PRINCIPLE

# 1

## PRIORITIZE LAND USE EFFICIENCY IN BOTH NEW TOWN DEVELOPMENT AND URBAN RENEWAL THROUGH COMPACT, EFFICIENT, MIXED-USE AND FUNCTIONALLY BALANCED URBAN DESIGN.

Efficient land use is an important part of China's new urbanization strategy and compact city layout is a key element of land use efficiency. Compactness does not equate to congestion. A human-centered, mixed-use, and balanced spatial design can enhance the livability of a city, increase the economic efficiency of urban infrastructure utilization, and foster greater economic and social vitality and creativity in the city, while protecting urban peripheral green space and farmland.

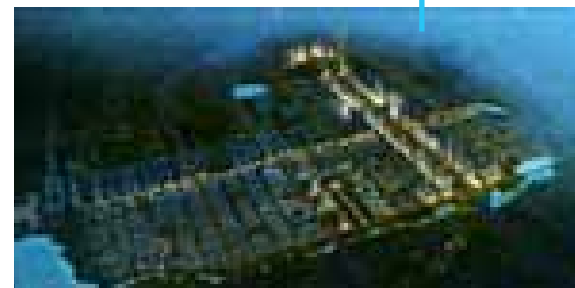
The following measures can help implement this principle:

- 1 Establish and observe Urban Growth Boundaries (UGB): Setting urban growth boundaries should be based on careful analysis of ecological sensitivity, environmental carrying capacity and land use efficiency; and along high-capacity public transit lines where possible. New development should only be extended outward of a city's growth boundary when the population density of the existing urban area has reached a certain level. Existing low density urban areas should adopt infill development strategies.
- 2 Construct small urban blocks and increase the density of street networks: Small commercial and residential blocks that are smaller than 40,000 square meters each are important elements of an efficient urban transport network. A relatively dense and hierarchical street network can facilitate non-motorized travel and reduce vehicle pollution.



Comparison of Superblock in the original plan (left) and smaller mixed neighborhood design in the new plan (right)

- 3 Design mixed-use development plans: A combination of office, residential and commercial facilities can improve convenience, increase community vitality, and reduce tidal traffic flows.
- 4 Cautiously redevelop brownfield sites: The redevelopment of brownfield sites for real estate projects needs policy guidance and a management system. Before moving ahead, it is important to determine the responsible party for pollution cleanup and specify the cleanup standards and acceptable environmental and health criteria.



Chengong Low-carbon Town Masterplan

## PRINCIPLE

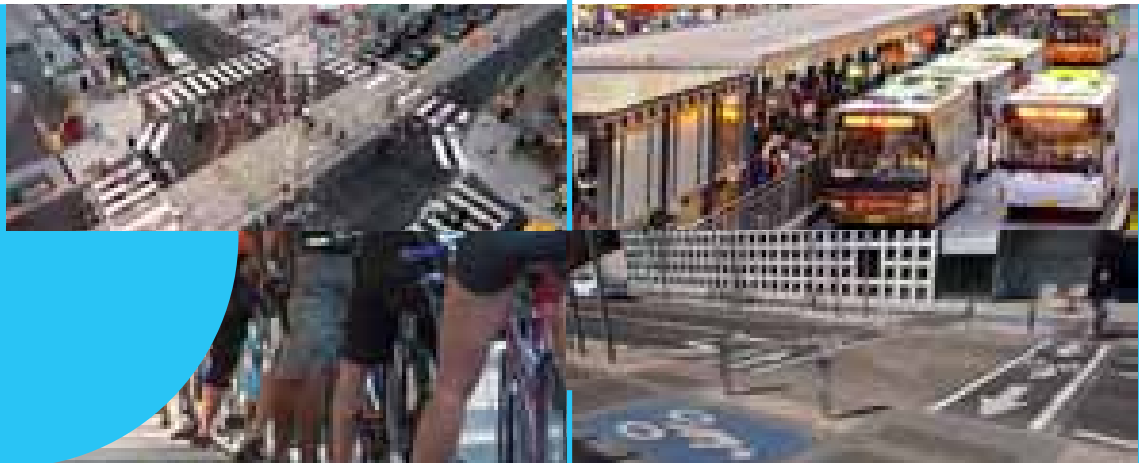
# 2

## DEVELOP NON-MOTORIZED TRANSPORT AS A MAJOR COMPONENT OF PUBLIC TRANSPORTATION, INTEGRATING WALKING, BIKING AND PUBLIC TRANSIT INTO ONE TRANSPORT SYSTEM.

Urban transport is a main component of economic development and city life. China's urban road infrastructure and public transit capacity underwent a transformational growth and improvement during the three more decades of rapid urbanization. However, traffic congestion still becomes a growing challenge in many cities, indicating that solely expanding the scale of roads and public transit lines will not effectively solve the congestion problem. By encouraging non-motorized transport, i.e. walking and biking, and building a multi-modal integrated public transit system, cities can reduce vehicle driving demand and avoid being trapped in car-dependency and high carbon emissions.

The following measures can help implement this principle:

- 1 Build complete and well-connected street systems for walking and biking: Cities should strive to eliminate the factors that negatively affect the connectivity of non-motorized streets and thus discouraging people from walking, biking and taking public transit, such as cut-off lanes, sidewalk obstruction by vehicles and other objects, and too many detours and stairs for pedestrians.



Guangzhou BRT

Bicycling lane design

- 2 Improve the safety, convenience and comfort of walking and biking: Walking can be made easier and more convenient by shortening the distances of street crossings and increasing the number of walk-through communities to reduce detours. Bike parking facilities should be provided around buildings, streets and public transit stops. Walking and biking can become more attractive and safer if sidewalks and bike lanes are not too narrow and streets have sufficient lighting. Street trees, vehicle buffering facilities, shelters, and public art objects along the streets can also positively enhance the experience of walking and biking.
- 3 Optimize the connectivity among different transport modes and stops: Improved planning, market-based measures, and innovative management methods should be employed to enhance the connections among underground and light rail, bus rapid transit, public bus, and biking stops. Urban greenways should also be organically connected with pedestrian walkways, bike lanes, and bus stops to increase their accessibility and utilization.



**BY ENCOURAGING NON-MOTORIZED  
TRANSPORT AND BUILDING A  
MULTI-MODAL INTEGRATED PUBLIC  
TRANSIT SYSTEM, CITIES CAN  
REDUCE VEHICLE DRIVING AND  
CARBON EMISSIONS**



## PRINCIPLE

# 3

## REDUCE PRIVATE VEHICLE USE THROUGH IMPROVED URBAN LAYOUT, EFFICIENT PUBLIC TRANSPORT NETWORKS AND TRANSPORT DEMAND MANAGEMENT.

Private vehicle ownership has soared in China along with the growth of household incomes and living standards. While private cars can bring certain convenience to urban dwellers, they have become a main source of urban air pollution and carbon emissions. City managers should target vehicle use by reducing the need for driving through urban planning and developing robust public transit systems.

The following measures can help implement this principle:

- 1** Enforcing the right-of-way for pedestrians & cyclists: The needs of pedestrians and bicycle riders should not be neglected in favor of giving too much street space to motorized vehicles. Cities with a large commuting population can more efficiently use street resources by prioritizing the right-of-way for Bus Rapid Transit (BRT) lines, which are relatively low-cost and fast in construction, and can handle a large number of passengers. All high-capacity transit options, e.g. BRT, subway and light rail, should lead transit-oriented development, which houses most residents within 500 to 800 meters of a transit stop. All cities need to consider their respective sizes, transport demands, and geographical traits in designing cost-effective, multi-modal public transport systems, which should include public bike sharing.
- 2** Manage parking spaces to help reduce vehicle use: The parking fees in urban central zones should be sufficiently higher than in the surrounding areas to discourage driving. The construction of parking spaces in commercial and office areas where efficient public transit is available should be limited. When planning new town development, city managers should set a cap on parking spaces in central zones in order to discourage the use of cars.
- 3** Enhance the service and operation efficiency of public transit systems: As cities invest in the scaling up of public transport systems, they should give due attention to the improvement of public transit system's operation efficiency and service quality, as well as the optimization of routes and stops.
- 4** Adopt traffic calming measures: Traffic calming measures can be used in residential and commercial areas, which not only help reduce the use of cars, but also increase the safety of residents and pedestrians. For residential areas the speed limit of 25 kilometers per hour is recommended.
- 5** Encourage public transit riding through financial and tax incentives: Large cities should consider establishing congestion charging zones or low emission zones, as well as implementing financial measures on fuel prices and personal public transit expenses.
- 6** Promote low-emission and zero-emission vehicles to meet driving needs: Governments should collaborate with the private sector and social organizations on increasing the demand and supply for clean vehicles, developing charging infrastructure, and raising public awareness.



Traffic Jam in Beijing Fourth Ring Road



Smog in Chinese cities

## PRINCIPLE

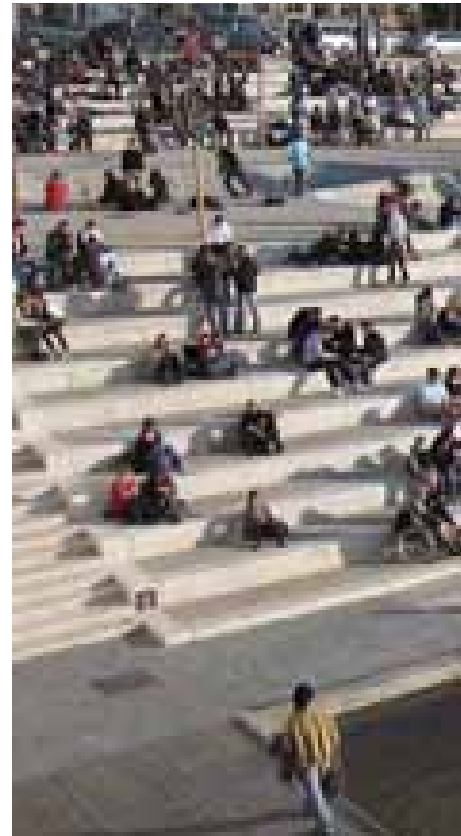
# 4

## CREATE AND MAINTAIN MORE QUALITY PUBLIC SPACES FOR THE GENERAL PUBLIC THAT ARE EASILY ACCESSIBLE, FUNCTIONAL, AND ENVIRONMENTALLY FRIENDLY.

Cities should have public spaces for citizens to meet and interact, hold events and gatherings, exercise, and other recreational activities. Gardens, plazas, waterfront relaxation facilities, and playgrounds are important areas for urban residents to become closer to nature and enjoy urban life. The efficient use of land does not mean that urban public space has to be sacrificed. It is possible to be efficient in land use while also provide citizens with adequate and quality public spaces.

The following measures can help implement this principle:

- 1 Construct urban spaces that are diverse in scale and type: Public spaces should have different sizes and be located wisely to allow easy access and maximum use by the public.
- 2 Stress human-centered and artistic design: Citizens should be able to engage in various lawful activities or enjoy peaceful moments in urban public spaces. Dedicated public spaces and street plazas can enhance people's living condition and neighborhood vitality, if properly incorporating art objects, landscape, activity facilities, walking paths, outdoor furniture, and other thoughtful designs that accommodate the needs of children, senior citizens and handicapped, such as benches, playgrounds, water fountains, and restrooms.
- 3 Respect and integrate nature into public spaces: Urban public spaces should incorporate and retain local ecological features to the greatest degree possible. Their designs should avoid overly expensive, eccentric, or oversized styles that are culturally inappropriate and economically unsustainable.
- 4 Protect cultural and traditional features in public spaces: Traditional architecture and old buildings in public spaces can enhance the style and personality of a city while reducing construction wastes and the cost of demolition and reconstruction during the renovation of existing buildings.





Tai Chi in Chinese street park



Public space utilization: Sunday market at Sao Paulo of Brazil

Rhone river park in Lyon of France

# RESOURCE EFFICIENCY





## PAY EQUAL ATTENTION TO PROCESS MANAGEMENT AND TECHNOLOGY UPGRADING WHEN STRIVING FOR ENERGY AND RESOURCE EFFICIENCY IN INDUSTRIAL AND COMMERCIAL SECTORS; PURSUE INDUSTRIAL SYMBIOSIS AND THE DEVELOPMENT OF A "CIRCULAR ECONOMY."

After thirty years of rapid industrial development, China is now entering the late stage of industrialization, with the development speed of the service sector faster than that of the industrial sector. In the last ten years, the Gross Domestic Product's (GDP) share of the service sector has grown to match that of the industrial sector. In 2013, China's service sector surpassed its industrial sector in GDP contribution. Industry and commerce are now two equal pillars of China's national economy, although industries still accounting for over 70% of the national total energy consumption. As China strives for developing a "circular economy" and continues its economic structural change, it will need to increase its attention to improving process management for energy and material use efficiency.

The following measures can help implement this principle:

- 1** Control greenhouse gas emissions: All cities should develop roadmaps for industrial greenhouse gas reduction, as well as prepare for participation in carbon trading once a national carbon market is established in 2017. Such roadmaps are especially important for carbon-intensive industries, such as power generation, non-ferrous metals, metallurgy, cement, iron and steel, and chemicals, but also for buildings.
- 2** Take energy efficiency as an alternative energy source: Energy efficiency is a low-cost, clean, and reliable energy resource. When conducting energy planning, energy efficiency resource should be considered along with other conventional resources, such as electricity and natural gas. For an equal amount of energy conserved, the investment in end-user energy efficiency is only one-third of the equivalent level required for building a new power plant, while the former strategy results in significantly reduced pollution and carbon emissions, as well as cost savings.
- 3** Fully utilize the existing resource potential of a city through urban waste recovery and cascade energy uses: The concept of "circular economy" should guide the development in industrial parks, with emphasis on waste heat recovery, complementarity of different processes, energy cascade uses, and waste reuse within the park, the city, and the region. These measures will help the city become resourceful, more stable in energy supply, and ultimately stronger economically.

- 4 Regulate the development of carbon-intensive industries: When developing new urban areas, strict control should be placed on those industrial processes that are high and inefficient in energy use to avoid the “carbon lock-in” effect. New industrial systems should be planned based on local resource endowment, environmental conditions, and comparative advantage. In transforming an existing industrial area, careful evaluations should be made taking into account local comparative advantages and employment impact and avoiding blind execution of one-size-fits-all approach.
- 5 Steadily develop renewable energy: Renewable energy is the ultimate source of energy for a low-carbon city. Cities should persistently invest in broad applications of renewable energy, including distributed solar photovoltaic, wind, biomass, and geothermal energy. While expanding the installed capacity of renewable energy, cities should also ensure the actual use of renewable energy is increasing as well.
- 6 Encourage low-carbon green innovation by industrial and commercial players: Businesses are a major stakeholder of a society, as well as an active innovator. With right policies and market-based incentives, corporations can collaborate with governments to tackle the many problems facing urban development, through business models such as Public Private Partnership (PPP) and Engineering Procurement Construction (EPC).





**AS CHINA STRIVES FOR  
DEVELOPING A CIRCULAR  
ECONOMY, IT NEEDS TO  
INCREASE THE ATTENTION TO  
PROCESS MANAGEMENT FOR  
INCREASING ENERGY AND  
MATERIAL USE EFFICIENCY.**

## PRINCIPLE

# 6

## KEEP IN MIND THE ENERGY AND ENVIRONMENTAL PERFORMANCE OF BUILDING OPERATIONS WHEN PROMOTING BUILDING ENERGY EFFICIENCY AND GREEN BUILDINGS.

Buildings are the fastest-growing sector in energy consumption in China, rising from 10% of total end-use energy consumption in 1980 to 20% by 2012. As China's economy undergoes structural change, a modern service industry will rapidly develop, which relies largely on built environment, i.e. large commercial buildings.

Because over 80% of the energy consumption in buildings is due to space heating, cooling and lighting, and water heating, one should not ignore energy efficiency during the building operation. Also worth noting is that even though an inefficiently designed and built building can claim to be "energy net-zero" through the use of renewable energy, it creates larger negative environmental impact and incurs higher operational costs than energy efficient buildings do. Moreover, a building's location may also influence the users' travel modes to be low-carbon or not. Therefore, building energy efficiency must look at every stage in the building life cycle, with the goal of reducing actual energy consumption during its use, as well as its overall environmental impact.

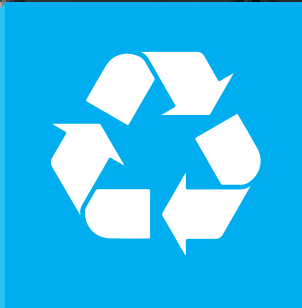
The following measures can help implement this principle:

- 1** Steadily strengthen building energy efficiency standards and environmental standards: These standards should be made more stringent over time for all stages of the building life cycle, including design, building materials production, construction, operation, commissioning, and demolition.
- 2** Promote passive building design: Taking full advantage of natural conditions in designing a building may greatly reduce the building's energy demand. For example, site design should consider local climatic conditions and dominant wind direction; the direction, size and style of a building should consider utilizing natural heating, lighting and ventilation.
- 3** Encourage the industrialization of building construction and complete fit-out of residential buildings: Delivering completely fit-out residential units can help ensure high energy efficiency standards, reduce waste generation, and minimize environmental impact.
- 4** Adopt market-based measures to leverage energy efficiency and conservation in building operations: Market-based measures, such as energy efficiency labeling, benchmarking and disclosure, energy audit, and retro-commissioning, can provide a long-term driver for energy conservation.





**ARE THE GREEN BUILDINGS REALLY GREEN?**



## PRINCIPLE

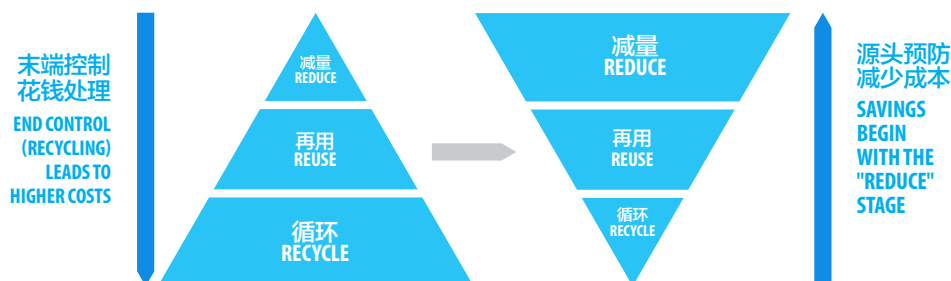
# 7

## VIEW MUNICIPAL WASTE AS A RESOURCE BY IMPROVING WASTE RECYCLING AND IMPLEMENTING WASTE MINIMIZATION MECHANISMS.

Waste is an inevitable result of human consumption. Municipal waste management in many Chinese cities is challenged by the sheer volume of waste that is still rapidly growing. Methane, generated from landfills, is one of the largest sources of greenhouse gas emissions. Landfill overcapacity and the unmanaged dumping of waste are threatening public health and sanitation. Besides what can be directly recycled, the remaining waste can also be seen as a resource. For example, the rich organic matter in municipal waste can be a source of biofuel or converted into organic fertilizer.

The following measures can help implement this principle:

- 1 Reduce waste generation at source: Manufacturers and businesses should be encouraged to use recyclable materials and reduce packaging. Products could be designed with a view to minimizing waste in all stages, such as increasing their durability, recycling and refurbishing the parts, and avoiding excessive packaging.
- 2 Develop waste recycling and reuse industries: If viewing municipal waste strategically as an urban resource, cities should formulate ambitious plans on recycling and the development of waste reuse business. They should also implement policies and regulations on waste separation, recycling, and the conversion of wastes into resources.
- 3 Strengthen the operation, management, and supervision of waste disposal facilities: Waste incineration, anaerobic digestion, and other treatment facilities (particular those operating in the PPP mode) should be supervised by both the government and the public.
- 4 Develop zero-waste communities: Cities can offer education on waste treatment methods to communities and encourage residents to participate in waste separation and minimization, with the help of community members and NGOs. Residents should also be supported to supervise waste disposal and management.



## PRINCIPLE

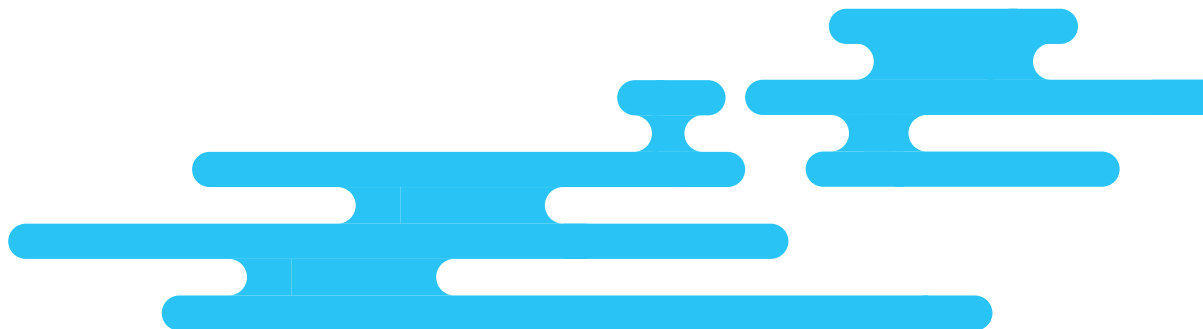
# 8

## EXPAND THE SCOPE OF RECLAIMED WATER USE AND SELECT LOW-IMPACT NATURE-BASED METHODS TO RESTORE AND IMPROVE URBAN ECOLOGICAL WATER CYCLES.


There is a growing tension between limited water supply and a rapidly growing demand for water. Many cities have experienced internal flooding due to a lack of capacity in storm water discharge, while also face fresh water shortage. Some cities construct water diversion projects to increase water supply, and at the same time invest substantially in expanding water drainage infrastructure, which sometimes involves altering river pathways to allow quick rainwater drainage. Confronted with both water supply and drainage issues, cities need to make efforts in raising water use efficiency and creating an ecologically sound water circulation system for flood control. A low-impact development approach mimics natural water circulation to help reduce polluted surface runoff and improve the circulation of a city's surface and ground water. Low-impact development is critical for sustainable water resource utilization and strengthening a city's resilience.

This principle can be realized through the below actions:

- 1** Optimize and improve sewage treatment facilities: undergo reasonable planning of new urban sewage pipe networks according to the regional climate differences, and reconstruct the old pipe network by upgrading the urban sewage treatment plants.
- 2** Raise the level of sewage regeneration and recycling: equip newly constructed urban buildings with a water reclamation system in order to improve the water recycling rate, and reasonably undergo water saving reform for existing buildings.
- 3** Prioritize the use of low-impact nature-based solutions to optimize and improve urban water circulation: use grass swales, rainwater gardens, sinking greenbelts and other green infrastructure to facilitate "slow drainage" and natural seeping to reduce surface runoff. Green roofs and manmade wetlands can store rainwater in various amounts, reducing demand for drainage facilities.
- 4** Reduce the disturbance to nature during urban construction: keep intact original geological formations, river pathways and local vegetation as much as possible.







**A LOW-IMPACT DEVELOPMENT  
APPROACH MIMICS NATURAL  
WATER CIRCULATION TO HELP  
REDUCE SURFACE WATER  
RUNOFF AND STRENGTHEN A  
CITY'S RESILIENCE.**

# INCLUSIVE URBAN GOVERNANCE<sup>1</sup>



## PRINCIPLE

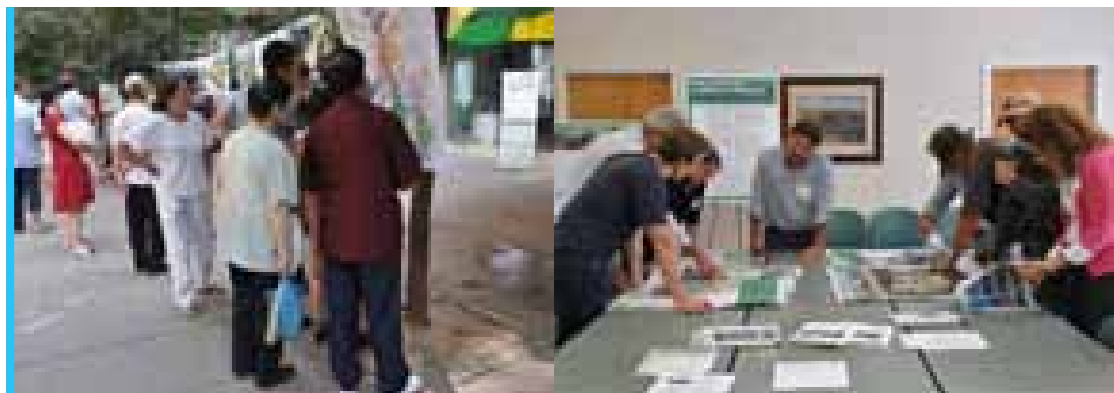
# 9

## TRANSITION FROM "CITY MANAGEMENT" TO "CITY GOVERNANCE" WITH EMPHASIS ON FOSTERING LOW-CARBON COMMUNITIES THROUGH INFORMATION TRANSPARENCY, PUBLIC PARTICIPATION, AND MULTI-STAKEHOLDER GOVERNANCE.

Good city governance is a vital step to creating a low-carbon and green city. As the world enters the information age and the society continuously develops, cities need to improve their management skills to embrace the concept of governance, a process that not only regulates urban affairs, but also coordinates stakeholders through public participation. The goal of city governance is to provide high-quality public services to urban residents and maintaining a good living environment. Moreover, cities should use the increasing amounts of available data to aid their urban management, such as on urban transport, government services, building energy efficiency, and natural disaster prevention.

The following measures can help implement this principle:

- 1 Ensure meaningful public participation: In urban planning, transportation planning, community planning, and other urban project planning, explicit and multiple channels should be set up for public participation and supervision. Major projects should especially make efforts to publicize the relevant information through both traditional and new media means to ensure information transparency and public awareness. In the new media era, major social issues are rapidly and widely discussed, resulting in increased desire and willingness of the general public to voice opinions. Therefore, public participation is no longer a choice, but a standard requirement in city and community governance.



Public participation



**CITIES HAVE THE CAPABILITY OF PROVIDING SOMETHING FOR EVERYBODY, ONLY BECAUSE, AND ONLY WHEN, THEY ARE CREATED BY EVERYBODY."**

Jane Jacobs, *The Death and Life of Great American Cities*

- 2 Strengthen environmental information transparency: Information transparency is the premise of meaningful public participation. Local authorities should view information transparency a critical step in good governance.
- 3 Experiment and practice cooperative governance at the community level: Community management should involve the stakeholders and get their input and support on local affairs. The collaborative governance model usually involves the pertinent government bodies, local enterprises, and the organizations representing the community. Communities inspired to lower their carbon footprints can look for such business models as public private partnership, contractual energy management, and franchise, to help implement energy efficiency and emissions reduction projects.
- 4 Promote low-carbon life style: Residential communities can seek to establish the facilities and the services that would reduce residents' needs for frequent driving, known as creating a "15 minute living circle." Residents should be encouraged and praised for their low-carbon and green behaviors, which can lead others to follow suit and gradually help establish a green and low-carbon social norm. In promoting low-carbon life style at the community level, local authorities can enhance the residents' sense of belonging and stewardship on the various green projects, thus enhancing collaborative governance.

## 社区低碳生活方式的公众教育

### PUBLIC EDUCATION ON LOW CARBON LIFE STYLE IN COMMUNITIES



WASTE  
CLASSIFICATION  
垃圾分类

REDUCE CAR USE  
减少小汽车使用

WALKING & BIKING  
多走路多骑车



ADVOCATE FOR  
RECYCLE  
提倡循环  
再利用



ENERGY SAVING  
BEHAVIOUR  
节约用能



## ESTABLISH CLEAR SOCIO-ENVIRONMENTAL THRESHOLDS AND ASSESSMENT MECHANISMS FOR URBAN INFRASTRUCTURE INVESTMENTS AND FINANCING TO SUPPORT GREEN AND LOW-CARBON DEVELOPMENT.

China's rapid industrial development has played a major role in causing serious environmental pollution, especially due to a large share of heavy industry and the coal-dominant energy mix. Further economic development and urbanization must firmly rely on green investments, which restrict financing polluting industries. At the national level, China is putting great efforts into creating a policy framework on green credits. However, at the city level, green financing is yet to be fully established. How the development of green infrastructure and green buildings can be better financed remain unclear. What is clear is that cities need to explore green financing options to support their low-carbon development goals. Such options will likely be multiple-investor, risk-sharing, and longer-term mechanisms that integrate available private and other financial resources.

The following measures can help implement this principle:

- 1 Develop policies to attract societal financial resources: Infrastructure and public service projects that fulfil with low-carbon criteria should enjoy lower entry thresholds for investments than in normal cases. They should seek public-private partnerships through open bidding. At the same time, financial support to high-polluting industries should be reduced in steps.
- 2 Design risk-sharing mechanisms for green investments: Proper rates of return and payment schedules are important for green infrastructure projects to attract societal capitals. Governments should closely monitor projects' financial compliance and payment execution on green projects enlisting the help of the public.
- 3 Standardize the monitoring, management and operation of PPP projects: Green urban projects possess a strong public attribute, thus demand reliable assessment of their effects. Local governments can support the development of standardized quantitative assessment methods to ensure those projects achieve the environment and social benefits and standards set by the governments. The reduction of greenhouse gas emissions, resource efficiency improvement, and public satisfaction with the services may be included in the assessment indicator list.
- 4 Build local green financing systems: Cities can support the establishment of local green financing mechanisms to service urban low-carbon development goals, such green credits and green funds. Other options can be considered are such as municipal and corporate green bonds, green insurance, and green internet banking.

**IT IS IMPORTANT TO ENSURE  
PROPER RATES OF RETURN AND  
PAYMENT SCHEDULES FOR GREEN  
INFRASTRUCTURE PROJECTS TO  
ATTRACT DIVERSE INVESTEMENTS**



**END NOTE** | <sup>1</sup> Inclusive governance implies that all people – including the poor, women, ethnic and religious minorities, indigenous peoples and other disadvantaged groups – have the right to participate meaningfully in governance processes and influence decisions that affect them. It also means that governance institutions and policies are accessible, accountable and responsive to disadvantaged groups, protecting their interests and providing diverse populations with equal opportunities for public services such as justice, health and education. —United Nation Development Program

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