

MoHURD Eco-City Implementation Guideline for Urban Renewal and Revitalization

Preamble. This Eco-City Implementation Guideline has been developed with the assistance of the Europe-Chine Eco-Cities Link Project (EC Link), and been submitted by the Chinese Society for Urban Studies (CSUS). It draws on the work done by the EC Link project in the development of sectoral toolboxes¹ which present European and Chinese best practices, urban development standards, indicators and methodologies for verification. Further, the development of this Guideline is informed by project work of MoHURD-affiliated pilot cities which are implementing eco-cities activities, and piloting innovative practices. EC Link has provided as inputs toolboxes for the following 9 sectors: compact urban development (CUD), clean energy (CE), green building (GB), green transport (GT), water management (water supply, waste water treatment and flood control) (WM), solid waste management (SWM), urban renewal and revitalization (URR), municipal finance (MF), and green industries (GI).

Objectives. The objectives of this Eco-City Implementation Guideline is to provide guidance, and to ensure compliance. The document is meant for all Chinese cities which are participating in the national MoHURD-supported eco-cities programme. Besides guidance, the document will help to ensure compliance of cities with the normative part proposed under this guideline.

Legal Basis. This Eco-City Implementation Guideline is complementary to the existing urban planning legislation of the People’s Republic of China (PRC), and other guidelines of the Ministry of Housing, and Urban-Rural Development (MoHURD), particularly those pertaining to eco-city development. The relevant legal reference documents are:

- Urban Planning Law. 1984. In 2008 updated as “The Urban and Rural Planning Law of People’s Republic of China”; latest revised in April 2015.
- Land Management Law. 1998.
And based on the law, the detailed Enforcement Regulation has been developed, and undergone revisions for several times. The latest is the 2014 version.
- Environment Protection Law. 1990. Latest revised in 2014 and applied since 2015.
- MoHURD. March. 2013. The 12th 5-Year Plan on the Green Building and Green Ecological Districts.
- CCPCC and State Council. March, 2014. National New-type Urbanization Plan 2014-2020.
- State Council. April, 2015, Suggestions on Enhancing Eco-civilization.
- CCPCC and State Council. 2016. Central Government Guideline on Urban Planning.
- CCPCC and State Council. 2016. The thirteenth Five-Year Plan (2016-2020)

Specifically for urban renewal and revitalization the following legal instruments apply:

- Law for the Preservation of Antiques. 1982. Latest revised in 2013.
- Urban Planning Law (as above)

¹ EC Link Toolbox. 2016. *Urban Renewal and Rehabilitation*. Beijing. Draft English version. www.eclink.org.

- State Council. 2013. Policy Guidelines for accelerating the redevelopment of shanty area
- MoF and MoHURD. 2013. Application for Subsidies on National Scenic Landmarks and Historic and Cultural City.
- MoHURD and SACH (State Administration of Cultural Heritage). 2015. The First List of Chinese Historic and Cultural Streets.
- State Council. 2015. Policy Guidelines for Promoting Urban Underground Utility Tunnels.

This Eco-City Implementation Guideline is *mandatory* for all Chinese cities which are participating in the national MoHURD-supported eco-cities programme. Compliance with its missions and technical targets will be monitored and reviewed by MoHURD. Compliance will be rewarded through special allocation of funding and technical implementation support.

Scope of this guideline. The geographical scope of this Eco-City Implementation Guideline are urban areas as defined by the existing legislation. The application of this Eco-City Implementation Guideline may be extended to Districts which are under the jurisdiction of a city (urban area), as applicable.

Substance of this guideline. This Eco-City Implementation Guideline is dedicated to Urban Renewal and Revitalization (URR). The implementation of eco-city development approaches concept makes it necessary to deal with old city areas, historic and cultural heritage, and complex issues in existing grown but dilapidated environments. To implement a green development agenda it will be necessary to have committed city and district governments so rules can be enforced.

Urban renewal and revitalization receiving less attention. Since the end of World war II, the urban development focus of most governments has been on new construction. This is particularly true of development policy as it relates to residential areas, including those built through authorized channels as well as those that have emerged through informal processes rather than government initiative. Typically, most of this housing stock was constructed in a hurried manner.²

Similarly, the desire for modernization by governments and decision makers in developing countries has often led to a view that only "modern" housing of new construction is a worthwhile investment. As a result, housing complexes of earlier vintage construction or those erected in the traditional style are often considered to be of little value. They are mostly torn down or, at best, ignored. Older-style housing, which is typically concentrated in the urban core, is often left in a state of physical deterioration and overcrowding, and tend to be poorly served by urban infrastructure. Therefore, it is easy to label such areas as "slums" and to slate them for demolition at the earliest opportunity.

² This and the following paragraphs make reference to related work by Steinberg, F. 2008. *Revitalization of Historic Inner-city Areas in Asia: Urban renewal potentials in Jakarta, Hanoi and Manila*, Urban Development Series. Asian Development Bank. Manila.

<http://www.adb.org/Documents/Reports/revitalization-inner-city/Revitalization-Inner-City.pdf>

Further, as a result of rapid population growth, many large cities in the developing world have undergone wholesale transformation of their urban economies, a phenomenon that has led to a dramatic shift in the composition of economic activity and the spatial pattern of land use in the urban core. The historic areas of such cities become transformed into tracts of land highly valued by commercial users. This increases the pressure to eliminate any remaining vintage housing stock.

For all of the reasons cited above, most cities in the developing world have paid—and continue to pay—very little attention to urban renewal and revitalization (URR) of their historic urban cores, including the housing stock that exists within them. As a result, these areas continue to decline, both in terms of their overall quality and their potential contribution to the city's housing market and overall economy.

Most cities have urban heritage. The potential contribution of these historic urban areas is vastly greater than is commonly realized. Even the fastest-growing cities still contain a vintage housing area that has existed for centuries, the large cities of today having simply grown up around this urban core. For example, the vintage housing stock of Beijing and Shanghai and others is—in quantitative terms—still significant, since it constitutes a large portion of the centrally located housing stock.

Defining urban renewal. In recent years, urban renewal and revitalization (URR) have emerged as important issues in urban planning and design, mainly because of the economic, cultural, technological, and physical benefits it confers. In this context, “urban renewal” refers to comprehensive reinvestment in the social, economic, cultural, and physical infrastructure of urbanized areas.

URR has been described as the intention to recover idle investment, employment, and consumption and to enhance the quality of life within urban areas.³ Others have added “growth” and “progress” to the definition of what they refer to as “urban revitalization” and stated that, as with earlier labels (e.g., “urban redevelopment”, and “urban regeneration”) urban revitalization implies growth, progress, and infusion of new economic activities into stagnant or declining cities that are no longer attractive to investors or middle-class households.⁴

Ultimately, cities have always been in a state of progressive transition. They are in a continuous process of becoming larger, smaller, better, or worse—in one way or another, and different than they were in the past. This process of continuous transition occurs largely in response to the political, industrial, economic, and social changes. Decay of inner urban space often occurs within the context of such transformation. Inner urban decay, crime, racial tension, riots, mass unemployment, and falling standards in the provision of urban services are some of the more obvious and disturbing indicators of a general and deep-seated deterioration in the social, economic, political, and financial fabric of a city. It has been observed that such decline can lead to out-migration of younger and more skilled members of urban populations as they seek employment elsewhere.⁵

³ Couch, C. 1990. *Urban Renewal: Theory and Practice*. London: Macmillan.

⁴ Holcomb, H. B., and R. A. Beauregard. 1981. *Revitalizing Cities*. Pennsylvania: Commercial Printing, Inc.

⁵ Middleton, M. 1991. *Cities in Transition: The Regeneration of Britain's Inner Cities*. London: Michael Joseph.

What is Urban Revitalization? In recent decades, urban revitalization initiatives have enjoyed increasing public and private support in industrialized countries – both addressing the historical texture of grown old urban centres and also to improve social problems in other neighbourhoods. However, in developing countries, interest in it—both intellectually and professionally—has rarely extended beyond heritage campaign groups, a relatively small number of foreign-trained local professionals, and external advisors who advocate adaptive reuse of heritage structures. For the most part, the legal and administrative framework for conservation of historic areas in developing countries—insofar as it exists at all—very often consists of a set of prohibitions against construction within historic areas, although effective enforcement of such provisions is rather rare. In developing countries, housing areas of more than average age are, for the most part, still seen as "problems" rather than as an asset for urban life that can make an important contribution to growth in national income and cultural identity.

URR and sustainable urban development. This guideline relates the benefits of eco-city development with those of urban renewal and revitalization (URR) concepts. Both represent different instances of sustainable urbanism. In Europe multiple experiences of ecological urban renewal have been accumulated, and it is felt that also China can extend its still fresh eco-city approach to ventures in renewal and revitalization of historic or older urban areas which warrant investment and upgrading. There should be scope to build into URR elements of clean energy, green building technologies, resource-conserving means of water supply, energy-efficient and chemically un-harmful means of waste water treatment, environmentally friendly means of solid waste management, and green industries – many of which are being discussed in detail in the complementary toolboxes also published by the EC-LINK program.

"Much of the world has begun to recognize the interrelationship and the interdependency between sustainable development and heritage conservation. Maintaining as much of the original fabric as possible is maintaining the character of the historic neighbourhood. That's cultural sustainability, also part of sustainable development. Historic preservation in urban renewal and revitalization can enhance environmental responsibility. Historic buildings represent embodied energy. Embodied energy is defined as the total expenditure of energy involved in the creation of the building and its constituent materials. When we throw away a historic building, we are simultaneously throwing away the embodied energy incorporated into that building. How significant is embodied energy? ... Much of the "green building" movement focuses on the annual energy use of a building. But the energy consumed in the construction of a building is 15 to 30 times the annual energy use... Razing historic buildings results in a triple hit on scarce resources. First, we are throwing away thousands of dollars of embodied energy. Second, we are replacing it with materials vastly more consumptive of energy. What are most historic houses built from? Brick, plaster, concrete and timber. What are among the least energy consumptive of materials? Brick, plaster, concrete and timber. What are major components of new buildings? Plastic, steel, vinyl and aluminium. What are among the most energy consumptive of materials? Plastic, steel, vinyl and aluminium. Third, recurring embodied energy savings increase dramatically as a

*building life stretches over fifty years... for many developers, real estate owners, architects, and city officials, the response to functional obsolescence is demolition. But the alternative environmentally responsible response is adaptive reuse.*⁶

Smart cities. The smart city movement also has a clear statement of principles which all mirror elements of the eco-city concept: (i) create range of housing opportunities and choices; (ii) create walk-able neighbourhoods; (iii) encourage community and stakeholder collaboration; (iv) foster distinctive, attractive places with a sense of place; (v) make development decisions predictable, fair, and cost effective; (vi) mix land uses; (vii) preserve open space, farmland, natural beauty and critical environmental areas; (viii) provide variety of transportation choices; (ix) strengthen and direct development toward existing communities; and (x) take advantage of compact built design.

As indicated above, much of the URR agenda can be seen as multi-sectorial and city-wide. In the following however, we are viewing this agenda with a perspective of urban neighbourhoods, and (historic) inner-city districts.

Justification.

Benefits of URR. In the contemporary Chinese context, urban renewal and revitalization (URR) will address the historic urban core of large and middle-sized cities in the first place. The benefits are manifold – but in order make them happen, the underlying economic feasibility and efficiency must be highlighted and secured rather than sentiment or other considerations can be discussed. The most important economic benefits of preserving a city's historic heritage include employment creation, stimulating commerce, and the occasional fact that it can cost less to rehabilitate a building than to construct a new one.⁷ To this one could add the psychological benefits of urban revitalization initiatives. *"First, we seek to preserve because our historic resources are all that physically link us to our past. Second, we strive to save our historic and architectural heritage simply because we have lived with in and it has become part of us. Third, we save our physical heritage partly because we live in an age of frightening communication and other technological abilities, as well as in an area of increasing cultural homogeneity. Fourth, we preserve historic sites and structures because of their relation to honour and understanding. Fifth, we seek to preserve the architecture and landscapes of the past simply because of their intrinsic value as art."*⁸

⁶ Rypkema, D. Economic Benefits of Preservation - Sustainability and Historic Preservation, <http://www.preservation.org/rypkema.htm>

⁷ Bever, T. D. 1983. Economic Benefits of Historical Preservation. In *Readings in Historical Preservation: Why? What? How?*, edited by N. Williams. Trenton, New Jersey: The State University of New Jersey.

⁸ Stripe, R. 1983. Why Preserve Historic Resources? In *Readings in Historic Preservation: Why? What? How?*, edited by N. Williams. Trenton, New Jersey: The State University of New Jersey.

URR revalidates neglected areas. Benefits of urban revitalization can be seen in its contribution to cultural education. Architectural heritage can play an important role in education. Today, when visual appreciation and first-hand experience play a decisive role in education, it is essential to keep alive the evidence of different periods and their achievements to provide a wealth of material for explaining and comparing forms, styles, and their applications (European Charter of the Architectural Heritage 1975).⁹ It must also be remembered that historic cities rarely are made of buildings dating from the same age, but they rather evolved incrementally over decades if not centuries. Therefore it is fully justified to complete a historic plan with high quality modern buildings as long as they respect the scale and townscape of the environment.

Urban centers are important assets. There exist a set of rules and values in urban development which apply to renewal and revitalization in the same way as the construction of new towns and neighbourhoods. Keeping in mind the interests of our all future, the UN sustainable development goals (SDGs), which replace the Millennium Development Goals (MDGs) serve well as a guide. They can be grouped in line with environment-ecological, economic, and social goals. Further below, the instrumental tools for URR planning and implementation will be presented in line with these goals.

Development potentials of centers. The previous views notwithstanding, historic urban areas are not necessarily worthy of revitalization simply because they are old. While it is absolutely justified to consider social and aesthetic values when appraising cultural heritage, these should not dictate all aspects of the future well-being of towns and cities.¹⁰ Conservation initiatives must be assessed critically and not merely in terms of the chronological age of the artefact or tradition in question. Economic consequences and opportunities need to be realistically calculated and become part of a government's transparent policy when it comes to decide about revitalization of urban centres. More often than not, current government policy towards the existing housing stock is marked by uncertainty internationally. But in general, governments do realize that it is counterproductive to remove large portions of existing housing stock while facing a rapidly expanding housing demand and recognizing the inability of existing institutions to provide new housing at the pace required locally. By default, political success is measured by the provision of new housing units rather than dwellings preserved. This often induces the demolition of older housing areas, or deterioration through neglect.

URR may not cover entire city centres, but only pilot project areas. Even in developing countries where urban renewal and revitalization has been attempted, such efforts are usually conducted only on a small scale and often focus on the most profitable projects, such as those portions of historic areas with tourist potential. This, in parts, reflects the widely held view that tourism is often the sector with the greatest potential for rapid growth in national income.

⁹ <http://www.icomos.org/en/charters-and-texts/179-articles-en-francais/ressources/charters-and-standards/170-european-charter-of-the-architectural-heritage>

¹⁰ Tarn, J. N. 1985. Urban Regeneration: The Conservation Dimension. *Town and Planning Review* 56 (No. 2): 245–268.

Once the decision to revitalize a historic urban area has been taken, the participation of current residents and other stakeholders is of utmost importance for the success of the venture. It goes without saying that the impact of conservation of historic towns and urban areas affects the life of the local residents in the first place. In return, their active support, or resistance, can make the difference between success or failure of an urban renewal venture. Hence, early consultation and inclusion of the resident population is mandatory in any such initiative.

Conflicts of interest. In any urban projects, different stakeholders tend to experience conflicts of interests and at the end not everybody will benefit the same. Therefore, any negative impacts on residents that result from urban renewal and revitalization initiatives (such as mandatory relocation) must be addressed at the project design stage rather than during implementation if optimal results are to be expected. Broken promises will not only discredit the project in question but will certainly trigger of public suspicion and distrust against any follow-up project venture the responsible authority will embark upon in the future.

Generally speaking, urban renewal and revitalization efforts involving historic areas typically employ or combine one or more of the following approaches:

Adaptive reuse and cost recovery. A key concern is raising the funds necessary for securing the necessary dynamics of initiatives from the start right through to completion. One approach to raising such funds is adaptive reuse. Under this approach, private entities and/or nongovernment institutions are allowed to lease historic facilities for commercially viable uses that respect and upkeep their historical value apart from earning a profit from the use of the facilities. However, adaptive reuse is not a universal solution to the problem of financing urban revitalization initiatives. Its usefulness is often limited when dealing with listed monuments and heritage objects, since these, while requiring expensive restoration works and being restricted from fundamental architectural adaptations, usually generate only modest revenues. Investments in monuments and related heritage objects thus often require not only political backing, but also financial support in form of tax incentives, loans on concessional terms, free leaseholds or even subsidies.

Commercialization of historic city centres. Few cities have followed an entirely commercial model in revitalizing historic urban areas. Singapore provides one example of this approach: the local redevelopment authority was given powers acquire all plots of land located within the designated conservation areas. These plots were then sold to commercial entities for adaptation of the historic buildings to be used as shops, restaurants, tourist hotels, or offices. Singapore's experience is that urban revitalization leads to a significant increase in property values. Rehabilitation of the shop houses in Singapore's heritage areas have caused property values to increase to nearly eight times their pre-rehabilitation levels, but completely changed the land use pattern as well as the social fabric.

Development Objectives

Alignment with MoHURD urbanization strategy. Urban renewal and revitalization (URR) is well aligned with the existing Green Building Action Plan of 2012. This plan did highlight the needs for retrofitting of the existing buildings and retrofitting of heating systems. The New Urbanization Policy of 2016 more specifically called for action to identify **historic cultural blocks and historic building in all cities**, and encouragement of integrated urban renewal and revitalization. In addition, the new policy has pointed out that within the 13th Five Year Plan all illegal constructions need to be dealt with.

MoHURD Strategic Objectives, Pronounced at the 2015 Central Urban Work Conference. In December 2015, the following directives were issued in regard to urban renewal and rehabilitation:

- Complete the ongoing renovation of urban substandard housing, underdeveloped areas in cities, and dilapidated housing by 2020;
- Enhance urban management to build smart cities;
- **Adapt the historical heritage into urban strategies. Overall city** planning shall consider reforms, technology and culture in order to improve urban sustainability. Cities shall strive to promote the reform of the planning, construction, management, household participation, and other aspects of planning. Cities shall consider the promotion of stable employment and life of the resident population as the primary task... Cities shall protect the traditional Chinese culture, and rehabilitate the city's historical context, as well as protect the cultural heritage. To combine their historical heritage, regional culture, cities shall promote their own profile.
- Accelerate the reconstruction of urban shantytowns and the transformation of the old districts. Urban development shall take into account nature and ecological restoration. This implies control of the intensity of urban development, promotion of the formation of green low-carbon production. Urban transport, energy, heating, waste water management shall act according to the concept of low-carbon green development.
- Encourage private enterprises and citizens to participate in development and management of their cities.¹¹

Basic Concepts. The following challenges of revitalization of old and historic centres appear to be the most relevant interest. There are a number of specific objectives which any urban renewal program may be requested to achieve – and these differ from project to project:

Sustainable development through urban renewal. Within the frameworks of sustainable development, urban planning ideally should enable a fair balance between economic, social and environmental concerns. The application of sustainable development principles are main characteristics of eco-cities.¹² Hence, the fulfillment of eco-city requirements will be measured upon the satisfaction of the various sustainability objectives – which generally can be achieved in the combination of different reinforcing or complementary instruments or planning tools.

¹¹ MoHURD. Meeting notes. 20-21 December 2015.

¹² Roseland, Mark (1997). "Dimensions of the Eco-city". *Cities* 14 (4): 197–202.

Environmental Sustainability Objectives.

Climate Change Mitigation. Climate change (including global warming) is currently one of the biggest threats to mankind. Modern urban development is one of its biggest causal factors. Hence, urban renewal has an important role to play in combating climate change. In such process, two different strategies need to be distinguished: Mitigation aims at reducing, stopping and eventually reversing climate change in the long run. The common logic of all mitigation strategies is to cut CO₂ emissions – mainly through stopping the use of non-renewable energy resources. On the other hand, Adaptation strategies aim at reducing the vulnerability of human settlements against the effect of climate change.

a) **Reduction of Non-Renewable Energy Demand**

The argument is as simple as it is convincing: less combustion of non-renewable energies (coal, petroleum, 'natural' gas) means less CO₂ emission which can stop global warming (by reducing the greenhouse effect)

b) **Energy – Recycling**

Recycling embodied energy in all kind of materials reduces the need for new generation of energy, but also energy transformation by means of heat exchangers, biogas plants, etc. Is equally beneficial for the environment

c) **Clean and renewable energy**

Not all energy sources impact directly on global climate. For example, biogas, wind or electricity generated through electro-voltaic can be considered clean energy which do not produce Green House Gas. The same applies to man-powered mobilization energy like cycling or walking.

d) **Combined measures**

More sophisticated measures ask for an interdisciplinary approach, like in the case of district heat-power plants (using waste energy in electricity production for heating purposes), or exploiting solar energy gains through house orientation, capturing of sun radiation energy or benefitting from night time cosmic cold radiation for cooling purposes.

e) **Land recycling and brownfield redevelopment**

As long as global population continue growing, additional land resources will be needed which invariably reduce the space for greens and natural forests which would have the capacity of transforming CO₂ into oxygen.

f) **Land reclamation**

Following the same logic, additionally needed land reserves can be created on shallow flood lands on swimming structures, palafites (traditional houses on stilts over water), or traditional house boats. Some experts believe that water surfaces represent our most important 'land reserves' for the future.

Climate Change Adaptation. Climate change mitigation efforts can only show visible results on the long run. In the meantime the most affected regions will have to bank on local defence mechanisms to secure their own survival (the so called adaptation strategy).

a) Micro climate / heat island reduction

Cities tend to develop higher ambient temperatures than the countryside around them. This phenomenon is known as the 'heat island effect'. Combined with seasonal hot periods (heat waves), inner city temperatures may become insupportable for many and can be the cause of seasonally high death rates.

In addition, individual blocks or streets may show higher temperatures than the city average – typically due to lack of ventilation, heat absorbing wall and floor surfaces or lack of greenery. Air conditioning may improve the indoor situation but simultaneously worsens outdoors temperatures, and makes the poor, who cannot afford air conditioning, suffer for the well-being of the rich.

b) Flood protection

Possible flood hazards to cities may have different origins. In some regions, like the Amazon or South Asia they occur seasonally and are part of the habitual eco system, but occasionally turn out much stronger as usual – mostly accentuated through climate change -- and can cause serious disasters. Cities can protect themselves through only to limited extent, as their supplies depend on surrounding regions, and through which most of the transportation links to more distant places are also channelled. Other causes may include careless deforestation for agricultural purposes or the construction of dams and reservoirs in earthquake prone areas etc.

In coastal areas human settlements may be affected by the rise of sea water level due to the melting of ices around the globe's poles as a consequence of global warming. This is a slow but steady process but turns especially hazardous in combination of high tides and storms. If no other effective measures are found and taken those settlements would have to be abandoned in 10, 20 or 50 years.

c) Drought prevention

When too much rain is falling in one region of the world it is no surprise that water is missing in others. Desertification has hit wide zones of Africa and Asia. But also in Europe water shortages occur more frequently than in the past. Water is an essential need for life and also the base for agricultural production. Rainwater catchment, recycling and simple water saving systems have become important requests in urban renewal projects around the globe.

d) Disaster prevention and erosion control

Most, but not all environmental hazards are a direct consequence of climate change. Disasters, like tsunamis and earthquakes are examples; other are man-made like huge industrial accidents, fires, war damages all cause a need for urban reconstruction and renewal efforts in the aftermath – and for provisions to reduce damages in case that a similar disaster should struck again.

Ecological Sustainability

a) Combating resource depletion

The fact that the mineral oil reserves will be exhausted in a few decades is perhaps good news in face of climate change and can be substituted by other kind of energy instead. But the planet possesses other essential resources which may be more difficult to replace, or need protection from all kind of pollution. Also land is becoming a scarce resource in urban development. Therefore urban reconstruction will have to be conscious of this fact in its own design, but also for its educative potential.

b) Preserving Biodiversity

Species extinction is a natural part of Earth's history. Human activity has increased the extinction rate by at least 100 times compared to the natural rate.¹³ Paradoxically in Europe, which has undergone an important industrialization process in agriculture, urban areas nowadays count a higher diversity of species than the surrounding countryside. In urban renewal care must be taken to preserve, or even better: increase, this biodiversity.

Human Health concerns

a) Healthy cities – healthy living

Mankind forms part of bio-diversity. Extinction is not an evident threat (though not impossible as a result of scientific or political mistake), but signs of degeneration cannot be denied. The built environment and urban lifestyles play a considerable part in this development, but are difficult to control by the individual. Healthy City concerns have become an integral part of urban renewal strategies.

b) Clean and ecologically suitable building materials

The science of Building Biology provides an interesting theoretical reference framework also for urban renewal projects world-wide. But particularly important in the context of energy conservation in urban renewal initiatives is the embodied portion of CO₂ in the building materials consumed.

c) Air pollution control

Many cities which do not happen to be located in a windy location suffer from smog these days – with serious consequences for public health and quality of life. Smog control has therefore become an important secondary goal of urban renewal projects in many places.

d) Noise pollution control

Equally disturbing can be noise pollution in cities. Most urban renewal projects, consciously or not, result in lower noise emissions locally.

¹³ http://www.google.de/imgres?imgurl=http://www.surfbirds.com/mb/media/living-planet-0207.jpg&imgrefurl=http://www.surfbirds.com/mb/Features/biodiversity-and-birds.html&h=350&w=500&tbnid=EvuoR50qeolcHM:&zoom=1&tbnh=90&tbnw=129&usq=_nopLxHwT_8KtoE_khaMtp4ixK3tU=&docid=sUnwlhtAnbTGKM. Visited 10/07/2015

Economic Sustainability Objectives

By today all planners and architects should have understood that no urban renewal plan will be implemented if the financial aspects have been worked out and settled beforehand. Economic sustainability means that both investment costs and operational expenses have been calculated and the financial sources been identified and confirmed. This does not necessarily mean that each investment must be economically profitable, but any subsidies must be justified by its social, ecological or similar value.

a) Green economy and Green Finance

The term **green economy** often only refers to low or non-carbon industries which may require some temporary financial regulation mechanisms to keep CO₂-free production competitive with conventional products and services.¹⁴ **Green Finance** investment schemes are set up (especially in Britain) to spread the higher investment cost of low-carbon production or consumption over a longer period and to offset them against long-term savings. UNEP, however, also includes other sustainability factors in the Green economy concept: *'UNEP has developed a working definition of a green economy as one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive.'*¹⁵ According to this interpretation, local solidarity economies and even local currency are being considered to offer more sustainable economic undertakings in contrast to profit maximising economies.

The establishment of green economy enterprises tend to work best in clusters, which hints to the need for shared infrastructure provision. Sometimes such clusters are integrated in brown field redevelopment projects.

b) Employment and Income generation

A major proportion of urban revitalization programs are being proposed for zones in which an important local employer has folded down or where there is a concentration of unemployed residents for other reasons. In consequence, the creation of new employment becomes a central objective of such projects, aiming at fixing the root problem of such areas and securing sustainability to the venture.

c) Reduced cost of infrastructure

Compared to new green field development, urban renewal can turn out to be more economical if existing infrastructure (roads, sewers etc.) can be integrated. Also for residents the possibility to remain in the same neighbourhood tends to be highly beneficial, since transportation cost from most likely less central locations can be spared and residential communities are not torn apart.

¹⁴ <http://climatepolicyinitiative.org/interactive/moving-to-a-low-carbon-economy/index.html?gclid=C1zhsoHP0cYCFUcTwwodEHcEMA>, viewed 11/07/2015

¹⁵ <http://www.unep.org/greeneconomy/> viewed 11/07/2015;
<http://www.unep.org/greeneconomy/AboutGEI/WhatIsGEI/tabid/29784/Default.aspx> viewed 11/07/2015

d) Internationalization

In the light of Globalization, many urban renewal initiatives are conceived like a shop window towards the world and expected to facilitate an upward move on the World Cities scale.¹⁶

Social Sustainability

Since physical decay of urban quarters can be interpreted as being not more than a symptom of other social and economic difficulties, an intelligent urban renewal program will try to analyse and cure the roots of the observed problematic. Most likely, as a result the envisaged measures will try to tackle the physical symptoms together with their social (and possibly economic) roots.

a) Location and ease of mobility

The greater a city, the more important becomes the aspect of accessibility of both residential areas and commercial zones. By definition urban renewal as a preferential alternative to green field development aims at preserving the established accessibility qualities of a neighbourhood given by its location. But many renewal projects additionally include an improvement in mobility opportunities – either by providing car parking facilities or allowing for reserved circulation space for pedestrians and cyclists.

b) Sufficient and good quality of housing

Due to a typically aged physical texture of renewal zones, building structures tend to be deficient which attracts a certain share of low- and least-income sections of society and who often bring with them the problem of overcrowding in addition. Therefore houses (residential or commercial) tend to require considerable repair and modernization. In addition, densification or overspill areas may become an additional necessity.

c) Responding to demographic change

Family structures have changed over time – today there are more single households and the population is getting older. Migration results in greater cultural diversity but also bears the danger of ethnic conflicts. Not only dwelling sizes need to be adjusted but specialized infrastructure support may be needed – and sometimes provided within urban renewal or revitalization schemes like in the German case study on the ‘Social City’.

d) Poverty reduction, education & skills

Well-to-do neighbourhoods dispose of the necessary economic means to keep their living environment in good shape. On the other hand, those quarters of the city earmarked for urban renewal programs tend to display problems of poverty and limited educational skills which must be addressed in one way or another in the interest of sustainability in the achievements of the program in question.

e) Social inclusion

¹⁶ <http://www.lboro.ac.uk/gawc/> reviewed 11/07/2015

Several European renewal programs attempt to overcome the observed stigmatization of run-down urban quarters through improving the social mix or the physical appearance of public space. Sometimes mixing residents with different social backgrounds has been attempted to promote inclusion, but more often than not failed- especially where the mix was enforced from outside. The case study on South Rotterdam shows a positive example where 'higher standard' residents were given incentives to move into poorer neighbourhoods.

f) Cultural identity

Whereby social exclusion is related to the view by outsiders, reinforcing cultural identity of a neighbourhood is primarily meant to raise the self-esteem of the residents themselves and support mutual aid initiatives. These may be monument of a local hero, physical landmarks, a traditional market or even an old and huge tree on a square. If no historical or popular piece of identification is at hand, a new 'iconic building' (or even an invented old one) can be constructed, like in the Case of Bilbao, Spain.

g) Conviviality, well-being, image improvement

Irrespective of the social status of the residents, almost all urban renewal programs try to raise the living standards and especially outdoors environmental qualities. Parks, urban forests, beaches, pedestrian streets could stand for examples.

h) Crime and Violence prevention

Urban crime and violence are on the increase in many parts of the world, and counter measures are usually welcome by residents and politicians. *Crime Prevention through Environmental Design* (CPTED) theories enjoy high popularity and are, by definition, urban valorisation programs.

General features of China's experiences with urban renewal and revitalization.

"Making all of China's buildings energy-efficient through weatherization is a colossal task, but also one that must be done and will go a long way to reducing China's energy intensity. Currently, the government has requirements that all new buildings must meet energy efficiency standards, and a recent report found that 20 percent of buildings in Beijing and Shanghai were energy efficient. The same report found that more than 90 percent of new buildings met those standards, but what about old buildings? It seems these regulations are focused on getting new buildings up to par, but there needs to be more money invested in retrofitting and weatherizing old buildings, which make up the vast majority. This can be done through a system of tax incentives, subsidies and punitive measures much in the same way the government is attempting to phase out aging industrial infrastructure. Also, this type of project is very labour-intensive, which is ideal for a developing economy."¹⁷

¹⁷ Ward, J. 2010. Growing a green economy in China. <http://en.people.cn/90001/90780/91344/6949181.html>, Beijing. April 13, 2010

China's history of urban renewal and revitalization. China's unprecedented urban extension has drawn in recent years again the attention to urban renewal and revitalization (URR), especially in historical cities.¹⁸ URR in China has been discussed since the creation of the People's Republic of China. Many studies and attempts have existed to launch larger URR programmes in Beijing, Shanghai and other cities.¹⁹ Many Chinese cities have a historic city centre left, though this may be rapidly disappearing. The dramatic urban surge which China has experienced, however, has meant massive destruction of old neighbourhoods across all cities. The advent of the car for mass transit, the need for more circulation space has meant the end for many old neighbourhoods (*hutongs*) in Beijing and tenement housing areas in Shanghai.²⁰

Prior to the Olympics in 2008 the international attention was drawn to wholesale destruction of entire neighbourhoods. This has happened despite the Beijing Municipal Government (BMG)'s plan for the conservation of 25 historic areas in Beijing's Old City, which had been endorsed in 2002.²¹

Problems of land values. The explosion of urban land values since the early 1990s has meant that historic residential areas have become an object of speculation and investment interest of private developers who have developed many new real estate schemes on the sites of historic residential areas. For many if not most of these this has meant that original population has been compensated and resettled to other, mostly far-off, alternative locations.

Tendency of gentrification. In URR, gentrification is a quite controversial outcome of renewal and revitalization processes. "Gentrification" means that the nature of social and economic character of an urban renewal area is radically changed with the effect that higher class social and economic standards are being introduced which usually are associated the exclusion of the former resident population and small or medium businesses. Some of the recent URR projects in Beijing seem to clearly to be illustrations of gentrification, replacing old building stock, and generating as per the old pattern high-end replicas for economically more advanced owners (examples in Nanluoguxiang, Beijing) and an outright conversion into "culture streets" and shopping malls (Dashilar/Qianmen area, Beijing). None of these seem to have considered eco-principles (yet). Entry point for the "greening" of today's URR could be: (i) renewable energy with solar elements (challenge to marry architectural conservation guidelines with technology requirements); (ii) utilization of "Passivhaus" technology (better insulation of walls, windows, and roofs), (iii) rain water collection (rain water harvesting) facilitated by sloping roofs and open courtyard spaces; (iv) neighbourhood-based waste separation and participation in ecological waste management schemes; and (v) greening of industries through the use of renewable "new" energy sources, and clean(er) production processes. Additionally, there seems to be reasonable good scope for urban agriculture activities in such traditional inner-city areas.

¹⁸ Hao Wu, and Wenyong Tan. 2014. Urban Renewal in Historical Cities in China: Exploring Methods based on Urban Form Studies. *Athens Journal of Tourism*. Vol. 1, No. 3. Pp.203-216.

<http://paper.researchbib.com/?action=viewPaperDetails&paperid=34987>

¹⁹ Lian, S.Y. 2014. *Remaking China's Great Cities: Space and Culture in Urban Housing, Renewal, and Expansion*. Asia's Transformations. Routledge. London.

²⁰ McCullum, D. 1993. Renewal of Older Housing Areas in Shanghai: Some Small-scale projects. *China City Planning Review*. Vol. 9. No. 2 (6). Beijing.

²¹ Beijing Municipal City Planning Commission. 2002. *Conservation of 25 Historic Areas in Beijing Old City*. Beijing Municipal Institute of City Planning and Design. Beijing.

Government sponsorship needed. To avoid and control the possible impact of gentrification, government's support is very much needed if URR is to succeed, and if continuity of the original resident population and small or medium-sized businesses is aimed at. Obviously, most URR schemes intend to introduce higher quality of urban spaces into the old urban fabric, a renewed quality of technical infrastructure, housing, and social services. The tendency will be to bank on the concept of mixed-use compact development which will be adaptable for modern uses and new clients. However, such mixed-use development should ensure a place for the original resident population and small or medium-sized businesses. This is not easy under the pressure to maximize the returns on development of precious, well-located inner-city land, and even if the government will attempt to enforce such policy or approach, in reality it may be difficult to achieve.

Historic towns in disaster-risk areas. Some of the historic old town centers in China, particularly in its long coastal belt are at risk to climate change-related risks of flooding and extreme weather. Through disaster risk mapping it need to be assessed which old towns are most at risks.

Smart green technologies. As green technologies will be applied, this will open opportunities for the use of smart technologies to more efficiently use environmental resources: for instance this can cover better control of renewable energy (for room heating and cooling, water heating, and electricity generation), or "Passivhaus" technology (remote control of shading or day light), water management (supply management). As smart technologies are being introduced to the general public through the Internet of things, this can also extend to more energy-efficient usage of household light and electrical equipments

Retrofitting of modern heritage. Besides URR in historic neighborhoods, the retrofitting of built environments of lesser historic value, is another potential area of green development. While Europe has implemented a number of retrofitting projects in 1950s or 1960s public housing schemes, most of them prefabricated construction technologies, this kind of retrofitting seems not be known in China, despite various pilot projects of MoHURD, funded with German bilateral support, and implemented with the support of the German International Agency for Technical Cooperation (GIZ).

Technologies and Products - Opportunities for innovation. The conservation of historic and valuable building stock, and its conversion to green buildings, does present many new opportunities for the building industry, as requirements for better and more energy-efficient construction materials have emerged, for instance for insulation in walls, windows, roofing materials. Renewable energy elements (Photovoltaic panels, solar water heaters) need to be better fitted to suit the aesthetic context of historic building stock. Likewise, less obstructive rainwater collectors and garbage recycling separation bins need to be installed in harmony with the built environment and their functions. It can be observed that residents of historical neighbourhoods have started to use solar technologies, and will eventually use more "ecological" or green building technologies once these are more suitable to their environment, the historic built environment.

Linking urban renewal and revitalization with eco-city development. MoHURD's eco-city programme and the work of some cities (Luoyang, Zhuhai, etc.) to preserve historic areas has brought to the fore the possibility of "ecological" urban renewal and revitalization in old neighborhoods. This will be no easy task since it will mean to confront the pressures

of market development, the commercialization of land, and the aims of developers. Instead it will have to deal with the resident population which is under threat of relocation and poor compensation by the conventional URR approach. Ecological URR is (still) a theoretical possibility, it needs yet to be put in practice in China.

Community Participation - Facing up to the challenge. In modern China, the issue of community participation has emerged like in the rest of the world. Techno-savvy China has developed its own approach to this topic through the use of the internet as a platform to solicit the views of community members and to request constructive inputs for planning and development of public interest schemes. As shown in the case of the urban renewal programme in Guangzhou, the local planning authorities have encouraged public participation for the drafting of a comprehensive renewal plan. However, as experiences of other URR has shown, there can be property owners who would not relent and would not like, for instance, to sell their property. This shows the limitation of the internet-based community participation, and indicates that there is ultimately no substitute for direct communication, particularly in cases of conflict management. The development of mobile applications (apps) may also offer additional opportunities for citizens to participate and be regularly consulted and involved.

Urban Renewal and Rehabilitation Approaches and Packages

Area of Activity	Type of Projects
Reduction of Non-Renewable Energy Demand	<ul style="list-style-type: none"> • Retrofitting through thermal roofs; • Additional floors with new high quality roofs
Energy – Recycling	<ul style="list-style-type: none"> • Area conservation with high-tech energy concepts
Clean and renewable energy	<ul style="list-style-type: none"> • Use of embodied energy through heat exchangers; • Biogas from waste products; • Smart solutions for district heating
Land recycling, brown field redevelopment	<ul style="list-style-type: none"> • Redevelopment through adaptive use of industrial land
Land reclamation	<ul style="list-style-type: none"> • Reclamation of unutilized land for expansion of settlement
Micro climate improvement / Heat island reduction	<ul style="list-style-type: none"> • Greening of streets and outdoor spaces; • Greening of roofs; • Greening of facades
Flood protection	<ul style="list-style-type: none"> • Sustainable urban drainage system; • Water proofing of ground floors and access above street levels
Drought prevention	<ul style="list-style-type: none"> • Rainwater harvesting; • Green Roofs; • Climate Adaptation Action Plans
Combating resource depletion	<ul style="list-style-type: none"> • Municipal waste and resource management
Preserving Biodiversity	<ul style="list-style-type: none"> • Community gardens; • Promotion of diversity of species; • Urban forestry;
Healthy cities – healthy living	<ul style="list-style-type: none"> • Urban agriculture; • Urban outdoor spaces for communities
Clean and ecological building materials	<ul style="list-style-type: none"> • Green procurement of building materials
Air pollution control	<ul style="list-style-type: none"> • Control of air pollution from local industries; • Reduction of motorized traffic in residential neighbourhoods through traffic barriers, and outdoor land use
Noise pollution control	<ul style="list-style-type: none"> • Traffic calming; • Road closures • Noise action plans
Public-private partnerships	<ul style="list-style-type: none"> • Soft renewal through private owners, encouraged by public agencies
Green economy	<ul style="list-style-type: none"> • Promotion of local green business enterprises • Playing the globalization game: international awards • Green banking • Green bonds
Economic revitalization and stronger global integration	<ul style="list-style-type: none"> • Place branding and iconic architecture; • Green business and leadership • Mixed land use
Access to adequate shelter	<ul style="list-style-type: none"> • Neighbourhood contracts and other governmental subsidy schemes; • Mass housing projects;
Tackling the land question	<ul style="list-style-type: none"> • Cooperative housing schemes
Location and ease of mobility	<ul style="list-style-type: none"> • Better and affordable public transport connectivity; • Revival of urban tramways; • Planning and Infrastructure for cycling; • Pedestrianization • Integrated mobility concept
Poverty alleviation	<ul style="list-style-type: none"> • Targeting of Urban Renewal and Rehabilitation programs to the poorest neighbourhoods; • Social City Programs • Focused income generation programs
Social inclusion	<ul style="list-style-type: none"> • Neighbourhood service centres
Fighting stigmatization	<ul style="list-style-type: none"> • Positive discrimination; • Community-led urban renewal programs; • Social engineering, • Mix of housing programs
Cultural identity	<ul style="list-style-type: none"> • Participation in preparation and implementation of community events

Cultural identity	<ul style="list-style-type: none"> Participation in preparation and implementation of community events 		
Crime and violence prevention	<ul style="list-style-type: none"> Conventional policing approach; Shared community space concept Community centres and promotion of community participation 		

Source: EC Link

Green building and green energy indicators. The prevailing indicators for green buildings, for green energy, water, waste water treatment and waste management will need to apply if URR projects are to be considered as compliant with national standards. In case that China engages on a larger scale in urban renewal, of course there may be scope for the formulation of specific standards and indicators, as available in some European cases.

Expected impact. The application of the urban renewal and rehabilitation approaches and technologies are expected to achieve a substantially higher, measurable impacts on environmental, economic and social sustainability. It will trigger increased investment, reduce energy consumption and CO2 emissions, and augment the number of jobs.

Responsibilities for Implementation. The responsibility for use and application of this Eco-City Implementation Guideline rests with the city administrations, provincial agencies, and the local MoHURD offices. MoHURD and CSUS will provide technical support and specific guidance where required. In its intention to pursue consistency of eco-city development, MoHURD is committed to verify the achievement of targets and to ensure improved performance on an annual basis.

Proposed Urban Renewal and Revitalization KPIs ²²

Urban Renewal and Revitalization			
	Indicator Category	Indicators: indicative values	Current achievements / Time frame for accomplishment
1	Identify cultural heritage areas and buildings in all cities [1]	100% [1]	By 2020 [1]
2	Retrofitting of existing buildings	≥15% [2] ≥10% [5]	By 2020 [1]
3	Annual heat demand: Existing buildings	≤ 45 kWh/(m ² a) [15]	
4	Use of non-fossil energy [2] Renewable energy usage in buildings [3]	≥15% [2] ≥20% [3] ≥30% [6] ≥60% [7]	By 2020 [3] By 2030 [6]
5	Transformation, rehabilitation and integration of shanty towns [4]	100% [4]	By 2020

Sources:

²² These key performance indicators were prepared and compiled by the EC-Link Project. See: EC-Link. 2016. *Sino-EU Key Performance Indicators for Eco-Cities*. Beijing (unpublished draft)

- [1] State Council, Government of People's Republic of China. 2016. 13th Five Year Plan. Beijing.
- [2] Qiu Baoxing. 2012. Combine idealism and pragmatism – a primary exploration of setting up and implementing low carbon eco city indicator system in China [in Chinese], China Construction Industry Publisher. Beijing
- [3] World Bank. 2009. *Sino-Singapore Tianjin Eco-City: A Case Study of an Emerging Eco-City in China*. Technical Assistance Report. Beijing. www-wds.worldbank.org/.../PDF/590120WPOP114811REPORT0FINAL1EN1WEB.pdf
- [4] State Council. 2016. *China's New Urbanization Policy*. Beijing. http://www.gov.cn/zhengce/2016-02/21/content_5044367.htm
- [5] CSUS. 2015. Zhuhai Indicator System for Livability. Beijing. [unpublished report].
- [6] Innovative Green Development Program (iGDP). 2015. *Low Carbon Cities in China: National Policies and City Action Factsheets*. http://www.efchina.org/Attachments/Report/report-cemp-20151020/1_CityPolicyFactsheet_EN.pdf
- [7] SWECO. No date. Caofeidian - Detailed ecological indicators system [unpublished document].

Monitoring and review. MoHURD will monitor and review periodically (i.e. annually) the results of the application of this Eco-City Implementation Guideline. Depending on the course of the eco-cities development, and its coverage of URR, it must be expected that the prevailing indicators for green buildings, for green energy, water, wastewater treatment and waste management will determine which verification methodology will be applied. It is currently open, to what extent the eco-city concept will influence the URR of Chinese cities.

For monitoring and periodic review it will utilize indicators as provided above. The city administrations (and district administrations), supported by the local MoHURD offices, will make regular use of these indicators as a means to measure performance.

Lessons Learnt from pilot projects. The current URR projects in China seem to lack the dimension of eco-city development. Nevertheless, as the eco-city developments spread through China, it can be expected that very soon pilot projects of Eco-city URR will emerge. The URR initiatives are expected to emerge soon, applying a variety of ecological approaches.

Ecological URR - a new dimension of urban renewal and revitalization. The eco-city approach offers something like a new opportunity for historic inner-city areas, and for modern heritage districts. The first wave of URR has affected many heritage areas with the impact of modernization and gentrification. The new potential of new approaches to URR, guided by eco-city principles could mean new chances and opportunities for urban heritage areas.

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ANNEX

Annex 1 – Technical Annex

(still to be added, once work in EC-Link cities completed)

Annex 2

MoHURD. 2015. *Appraisal Standards for Green Eco Districts. Beijing. (draft).*

Excerpt

Sector	Criteria Category	Detailed Criteria	Score	
Green Building	Controlled Criteria	New buildings are 100% 1-star green building, 30% at least 2-star green building; 50% of new large public buildings are at least 2-star green building; state invested public buildings are 100% at least 2-star green building.		
		Specific planning for green building has been made, including clear development goals, key tasks and assuring measures.		
	Priority Criteria	1. Develop guidelines for various appropriate green building technologies.	10	
		2. Area percentage of 2-star and 3-star new green building	>35%	10
			>40	15
		3. area percentage of retrofitted existing building with green building certification	>10	5
			>20	10
		4. Area percentage of new buildings with total prefabricated construction.	>3%	10
			>5%	15
			>8%	20
		5. Management documents on technical manual, construction guideline, etc. of green building projects for various stages of the whole approval process have been drafted by the construction authority.	10	
		6. Quantity of demonstration projects on green construction	1	5
			2	10
7. percentage of buildings with green operation certification	>5%	5		
	>10%	10		
	>15%	15		
8. The local authority has carried out post-construction assessment for green buildings.	10			