

..... Better City, Better Life

# Ecological City Planning Aimed at Energy—Saving

—Based on Zhengzhou Yanminghu Ecological Civilization Demonstration Area Planning

## 节能目标下的生态城市规划途径探析

——以郑州雁鸣湖生态文明示范区规划设计为例

黄聪健 邓沁雯

华南理工大学

2010.5

## Key words :

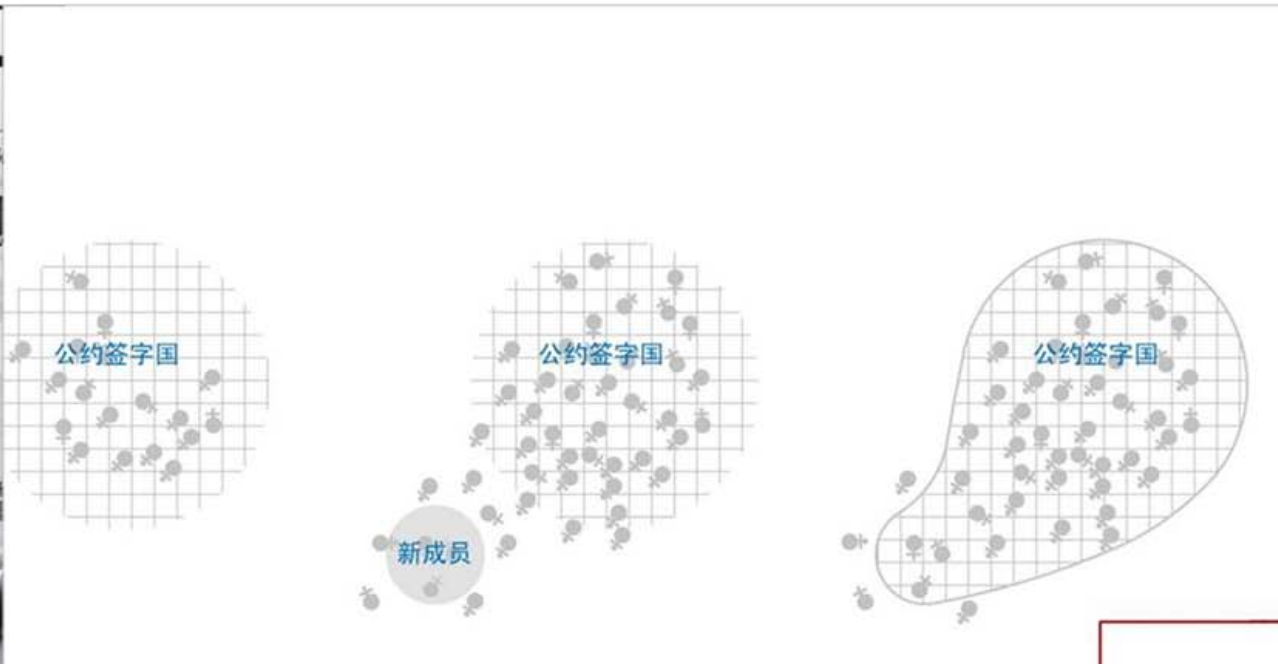
energy-saving

Ecopolis planning

Zhengzhou Yanminghu



2009 World Climate Conference in Copenhagen pushes energy conservation to the center of the public opinion worldwide once again. The growing model based on high consumption does not conform to the requirement of China's socio-economic development clearly. Therefore, how energy-saving concepts is integrated into eco-city plans, and exploring of the eco-city planning approach aimed at energy-saving, building ecological civilized city, to achieve the strategic plan of building "resource-saving and environment-friendly," society ,become the hot plot of urban planning study.



时间轴

一是加强**节能、提高能效**工作，争取到2020年单位国内生产总值二氧化碳排放比2005年有显著下降。

二是大力发展**可再生能源**和核能，争取到2020年非化石能源占一次能源消费比重达到15%左右。

三是大力**增加森林碳汇**，争取到2020年森林面积比2005年增加4000万公顷，森林蓄积量比2005年增加13亿立方米。

四是大力发展**绿色经济**，积极发展**低碳经济**和**循环经济**，研发和推广气候友好技术

——2009年9月22日胡锦涛在联合国气候变化峰会开幕式上的讲话

11月26日，中国政府宣布了控制温室气体排放的行动目标，决定到2020年单位国内生产总值二氧化碳排放比2005年下降40%-45%。

“应该建立适应**可持续发展**要求的生产方式和消费方式，优化能源结构，推进产业升级，发展**低碳经济**，努力建设资源节约型、环境友好型社会，从根本上应对气候变化的挑战。”

——2007年9月8日胡锦涛在亚太经合组织第十五次领导人非正式会议上的讲话

# 1 Ecological City Planning Aimed at Energy Saving

## 1.1 The conception and methods of Ecological City Planning

**Ecopolis** is the human settlements where resources are used efficiently; ecological environmental is harmony; economic develops efficiency; sustainable development is available; social ,natural ,and economic coexist as harmoniously as man and nature.

Ecopolis planning is based on several subjects and emphasizing the application of the theoretical knowledge of ecological planning in urban planning; using ecological concepts in planning urban development; putting ecological concept into urban planning process; such as **ecological functional zoning, ecological spatial structure layout, space development and construction constraints division, ecological carrying capacity assessment, planning environmental impact assessment, advocacy and social participation.**

## 1.2 Absence of energy efficiency goals

**Comprehensive planning**—— steps as” Population Forecast - Determine the scale of land - Land Use Planning”, focusing on the planning of construction land ,which is lack of attention on integrity and continuity among Society and nature, the environment, and resources .

**Detailed Planning** ——guided by "Feature - space - form", taking space form as the most important element of the allocation of resources ,which ignoring the Carrying capacity of the environment.

**Micro-level energy saving technology** ——such as green building, building materials and other energy-saving strategy or technology research ,lacking of wider consideration.

## 1.3 Significance of energy-saving to the ecological city planning

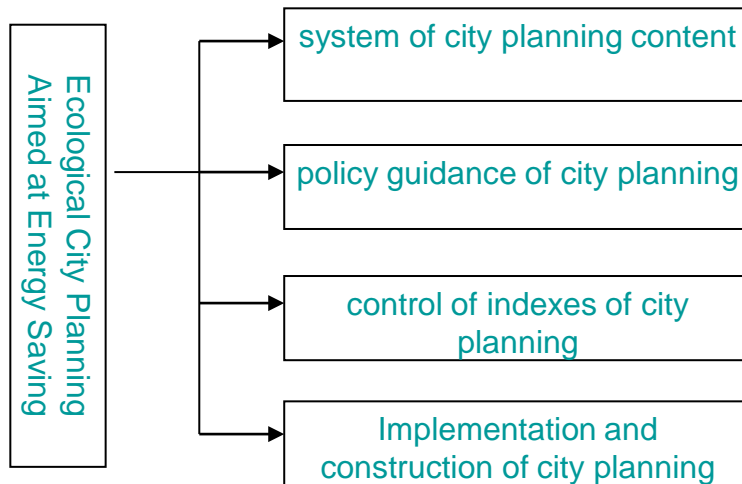
Nowadays ,we are facing to a critical situation of energy supply because our society is consuming energy rapidly. City Ecological Planning is supposed to reduce the importing of energy and material flux from ecosystem, and to reclamation the output, in order to promote of natural, social, and environmental harmony. how to study energy saving on urban social, economic, ecological, and transportation systems in order to plan the city energy reasonable and maximize the utilization of resources is the way to reduce the energy pressure in current.

## 2 Ecological urban planning aimed at energy-saving goal

---- Based on the example of Yanminghu Ecological Civilization Demonstration Area Planning

### 2.1 Research Framework

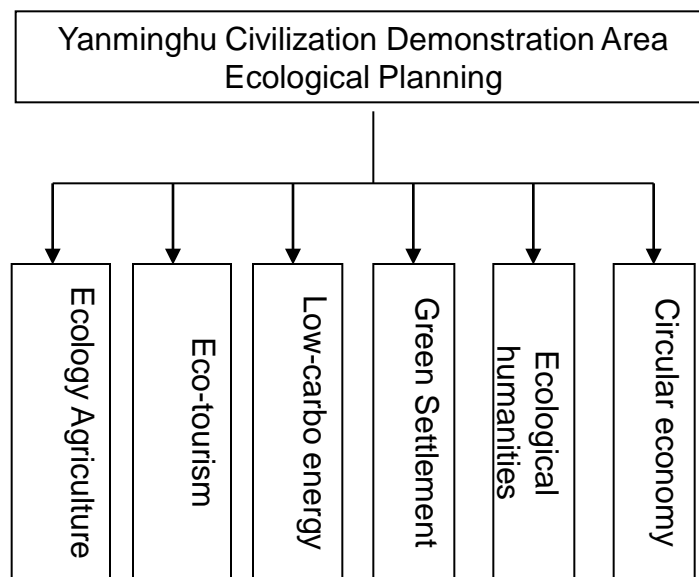
To explore the methods of ecopolis planning based on energy-efficiency goals, we may start from four components: the content of the system level, urban planning, urban planning to guide the strategic level, control level indicators of urban planning and urban planning and construction implementation level.



# hu Ecological Civilization Demonstration



## 2.2 Construction of Yanminghu Ecological Civilization Demonstration Area Planning



Developing the ecological agriculture and eco-tourism , Yanminghu Ecological Civilization Demonstration Area is constructing the advanced city industrial system and cycle economy. Through the efficient use of resources ,building green residential , it reflects the ecological civilization of society. By introducing the technical support system ,it constructing the framework of cycle economic on the fields of **energy utilization , building energy efficiency, circulating and purify of water system** .All the systems are interrelated, integrated to realize the maximize of energy saving ,to achieve the goal of “zero emissions” in the demonstration area.

## 2.3 Energy-saving way in the eco-planning of Yanminghu

### (1) System of city planning contents Level —— Energy System Planning

**Energy System Planning** ——The construction of evolvable energy system is based on the sense of compound energy system, depending to building scale, natural resources, load demand and economic benefits ,by reducing the consumption, improving the conventional energy efficiency ,and matching the recyclable resource and renewable energy approach reasonable , to maximize the efficiency of energy systems and improve the overall effectiveness of the city.

## The planning control frame of **energy system planning**

Energy system planning frame	The level of concept(City master plan)	Indexes system level(Regulatory plan)	Technical program level(Constructive Regulatory Plan)
	Reducing the consumption	Energy intensity indicators	Low energy building design
		Building energy efficiency standards	
	Fully rational use of renewable energy	The proportion of renewable energy applications	Renewable energy applications
Efficient use of conventional energy	The proportion of clean energy	Efficient use of conventional energy technologies	

### **low-carbon Principle**——**CLEAR Principle**

the plan of Yanminghu energy system followed the principle to realize the core way to achieve low-carbon---- C(Capture and Storage)L(Loop)E(Efficient)A(Additional)R(Renewable) . And the core way to achieve low-carbon is :  $\Delta C=C+L+E+A+R$ ( $\Delta C$  represent the reduce of Capture and Storage )

## (2) Planning Policy

### Ecological Industry Plan--- **Circular economy**

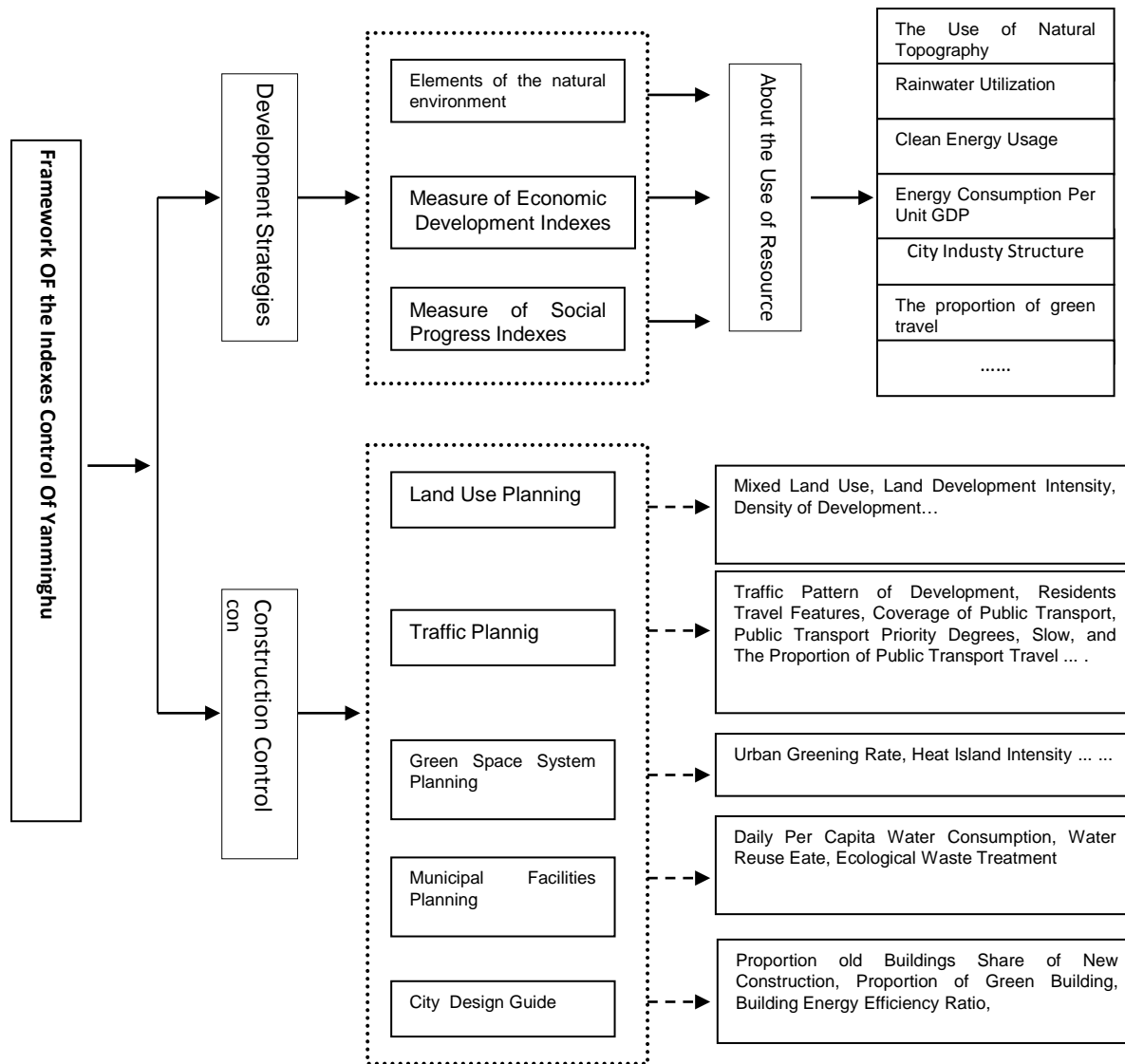
Ecological industry plan is based on eco-energy saving, to construct an ecology-oriented industry system plan. The whole plan reflects the important content of energy saving . Circular economy is a short name of closed-loop material flow economy. Material and energy echelon and material and energy is closed-loop recycling is its character. It shows low pollution emissions, or even zero pollution emissions. Circular economy integrates the clean production, resource utilization, ecological design and sustainable consumption, using the ecology law to guide economic activity. In the constructing of Yanminghu Ecological Civilization Demonstration Area, we following the concept of circular economy ,use the new material that is environmental protection and energy saving ,build up circular agriculture and industry, manage to reduce the damage of ecological environment to the lowest and maximize the energy efficiency, that makes the Yanminghu the demonstration area of using circular economy.

## Transport System Plan--- Green Transportation

**Green Transportation** is a union transport system that is low-pollution, good for city environment, containing diverse urban transport, to reduce congestion, to save building and maintenance costs.

Green Transportation in Yanminghu planning embodies in **three aspects**: firstly reducing the use of personal motor vehicles, In particular, reducing the use of high polluting vehicles, secondly promoting walking, the use of bicycle and public transport, thirdly, promoting the use of clean fuels and vehicles. By the zoned policy of transportation and reasonable guiding strategy ,we can achieve the energy-saving goal.

### (3) The Control of the Indexes



## (4) Urban Planning and Implement

The energy-saving goal in city planning and implementation level is mainly embodied in the planning system technology . The current energy-saving technology is mainly in the single building, municipal facilities .

Yanminghu eco-planning use a large number of energy-saving technologies, containing green building, municipal energy-saving technology and energy technology.

**Green building** —— applying Low energy lighting, natural ventilation, rainwater and water recycling and use.

**The Integrated technology services energy conservation** ——uses regional integrated ditch – pipe technology and waste ecological engineering.

**Energy Technology** ——energy saving equipment and energy-saving technology

## (5) Summary

### Methodological framework

Ecological City Planning Aimed at Energy Saving	system of city planning content	Add energy system planning
	policy guidance of city planning	Promote circular economy、 green transport and Ecological strategies of energy-saving
	control of indexes of city planning	The Control Of The Indexes Level in the aim of senergy-saving
	implementation and construction of city planning	Energy-saving technologies, such as Building energy saving technology、 Municipal facilities, energy-saving technology、 Energy saving technology and so on.

### 3 Conclusion

Exploring the methods of eco-city planning which aimed at energy saving, we should re-examine the current planning methods, introducing the “resources, environment, energy” factors into the traditional “Function - form – Space” base. Targeting security ecology, economy, society, energy saving, integrating the society, resources, environment, energy factors to set up ecological construction planning and grasp the macro-strategic level and micro level implementation of the various factors, we can constructing an integrated resource-intensive system. At the same time, we also need to turn to the related technology support, so we can advance the construction of city ecological civilization, finally realizing the harmony between man and nature for sustainable development.

请大家批评指正！

谢谢！

**Welcome for your proposal**

**Thank you!**