



# **Environmental Protection and Sustainable Development in China**

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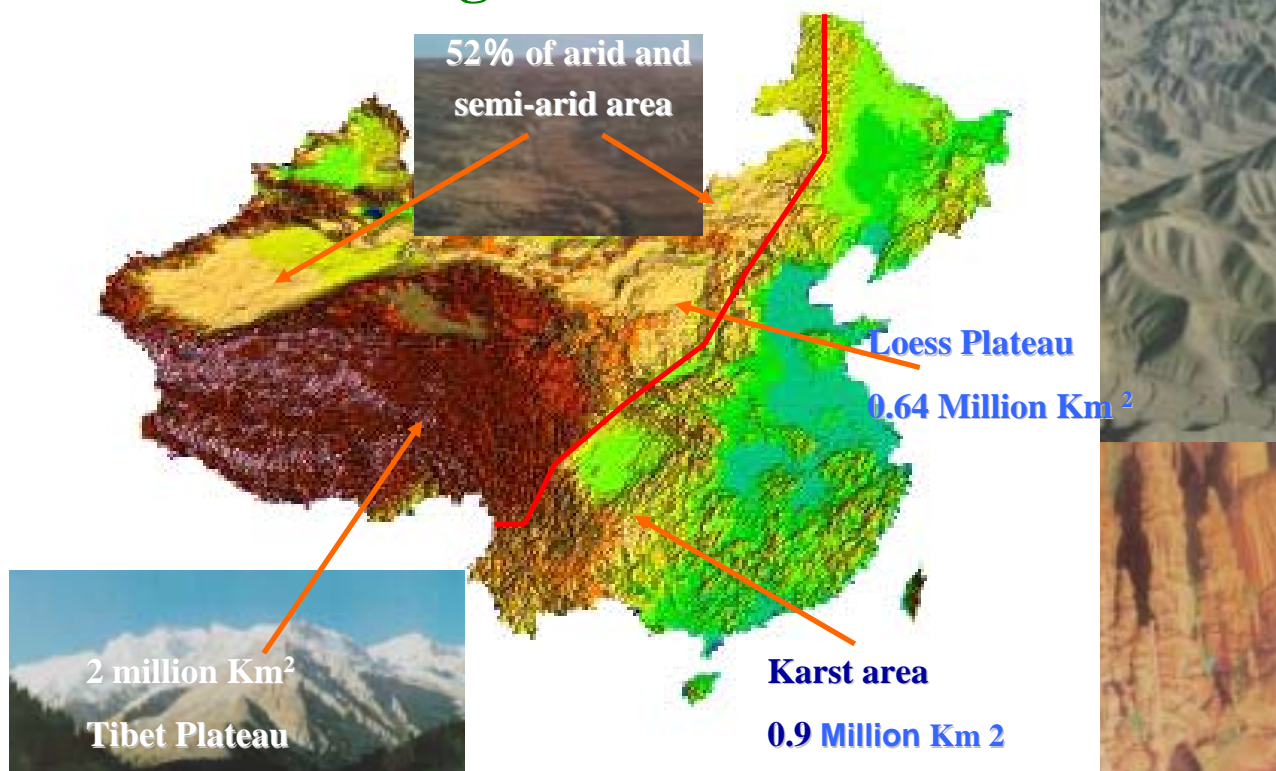
## **Outline**

- ❖ **Current status and challenges**
- ❖ **Efforts made for sustainable development**
  - Cleaner production**
  - Circular economy**
- ❖ **Measures for promoting sustainable development**

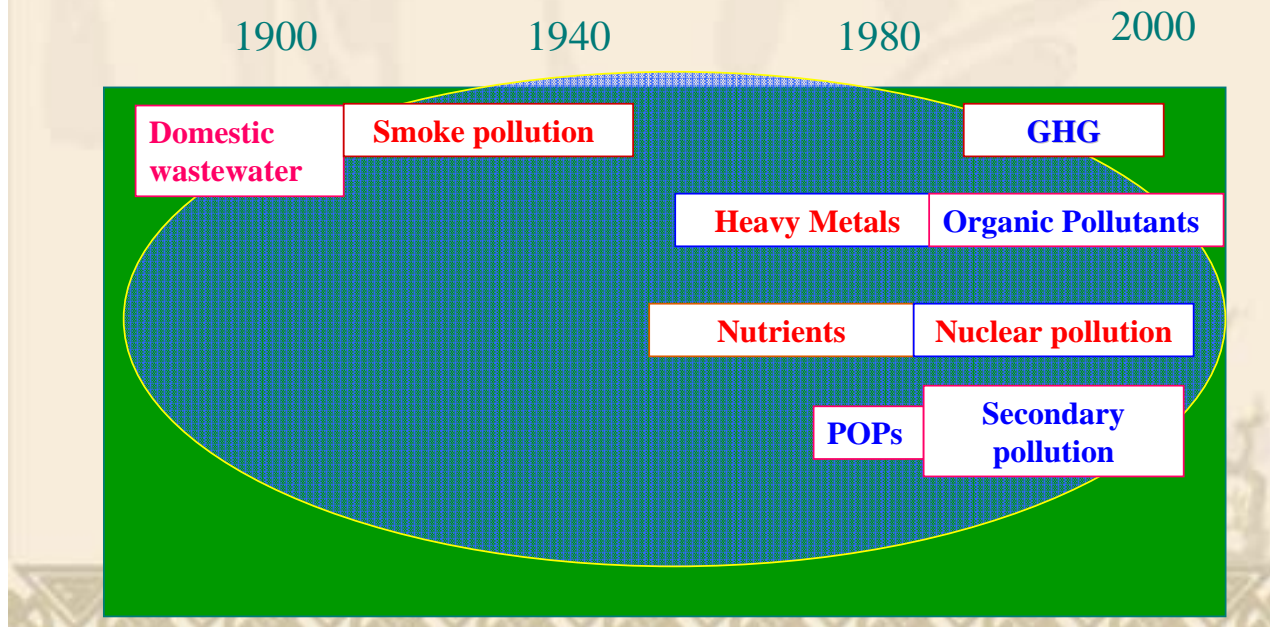
## Comparison of Natural resources available for per capita in China and the world

❖ Water	25%
❖ Arable land	<40%
❖ Petroleum	8.3%
❖ Natural gas	4.1%
❖ Copper	25.5%
❖ Aluminum	9.7%

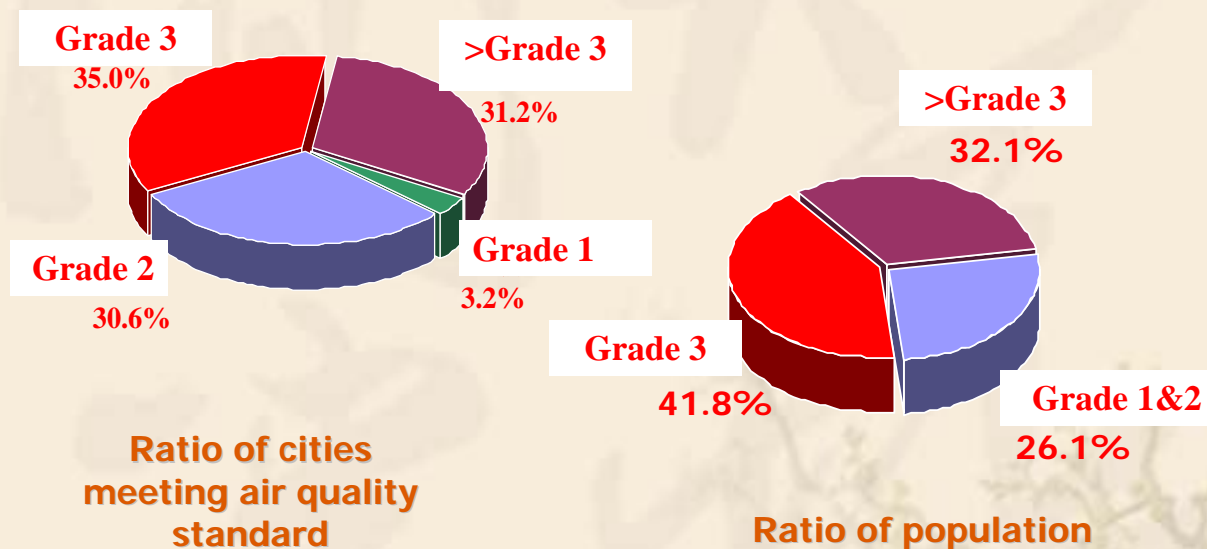
## Inherent Shortage of Natural Environment



## Environmental Problems appeared in different periods of 20 century in developed countries concentrated in China in recent 20 years



In 2005, Among 340 cities monitored, more than 66% cities can not meet the air quality standard for healthy living of people.



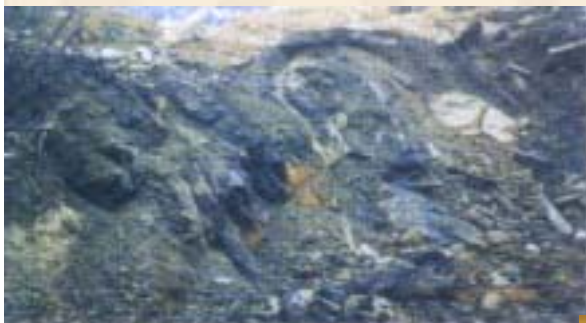
73.9% of the population in cities are living in unqualified air quality condition.

# Water Quality Classification of 7 major river basins in 2006

I – III	40%
IV- V	32%
>V	28%

60% of monitored sections can not meet standard for drinking water resource's quality.

## Increased Solid Wastes



Chemical wastes

- Lack of safety treatment and disposal facilities

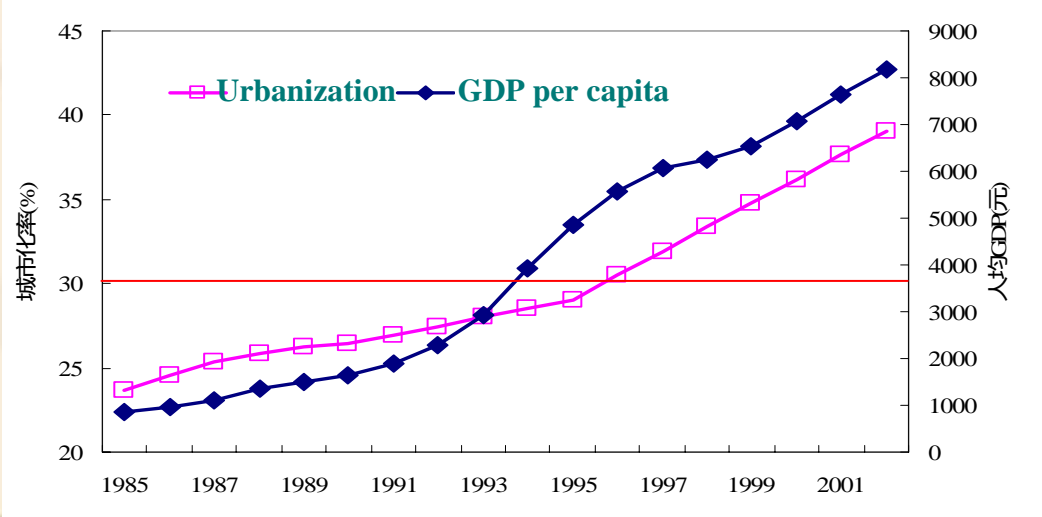
- Domestic solid wastes
- Industrial solid wastes
- Hazardous wastes
- Medical wastes



Medical wastes

# Urbanization in China

Prediction: GDP per capita will be US\$2800 and urbanization rate will be 60% in 2020;  
 From 2002 to 2020, about 290 million people move to cities



	China	USA
Area	960	930
Population	1307	296
Land area per capita	7326	31300
Arabic land per capita	732.6	6261

**Growth creates  
Resources and environmental risks...**

**...but also opportunities for innovation  
and reformation.**

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**Key issues:  
increasing resources productivity;  
Changing development pattern.**

## **Strategic Change in China 1978 - 1992**

- ❖ **1978, “Open Door Policy” being adapted, the reform in agriculture and town & village industrial development initiated the “China Miracle”;**
- ❖ **Environmental law system was built in this period and began to work for controlling environment pollution and protecting the nature.**

## **Implementation of Sustainable Development strategy (1993 - 2001)**

- ❖ **1992: Adapted sustainable development strategy**
- ❖ **1994: Agenda 21 for China issued**
- ❖ **promoting Cleaner Production**
- ❖ **Environment pollution has been controlled to some extent, but rapid industrialization & urbanization compromise the efforts, the situation was still serious.**

## **New progress for development (2002 --- )**

### **Key issues:**

**Change of production pattern**

**Change of consumption pattern**

### **Goals:**

**to build a resources conservation and environmental friendly society**

# Cleaner Production

- ❖ the continues application of an integrated preventive strategy
- ❖ applied to products, production and service
- ❖ for maximizing utilization efficiency of resources and minimizing waste discharge
- ❖ may reduce risks to human and environment and increases economic benefits.

## Ways of Cleaner Production Implementation

- ❖ Management practices or housekeeping alternations
- ❖ Recycling within processes
- ❖ Feedstock substitution
- ❖ Equipment replacement or modifications
- ❖ Process modification
- ❖ Product reformulation and eco-design



## **Efforts made in Implementing CP in China (1)**

**1980-1993**

- ❖ **Low waste and non waste process;**
- ❖ **Process control of waste discharge;**
- ❖ **Action plan of CP , NEPA;**
- ❖ **International conference on CP, 1992.**

## **Efforts made in Implementing CP in China (2)**

**1993-1999**

- ❖ **Second conference on industrial pollution control took CP as the priority;**
- ❖ **Agenda 21 adapted CP as an important measure;**
- ❖ **A series of demonstration projects carried out with the help of UNEP, WB and other countries.**

## Efforts made in Implementing CP in China (3)

1999-present

- ❖ CCICED (China Council for International Cooperation on Environment and Development) formed CP working group;
- ❖ To promote CP has been addressed by the Prime Minister in the State Report in 1999;
- ❖ Demonstration projects on CP have been carried out in 10 cities and 5 industrial sectors ;
- ❖ Law on Promoting Cleaner Production has been issued and put into effect on 1 Jan. 2003.



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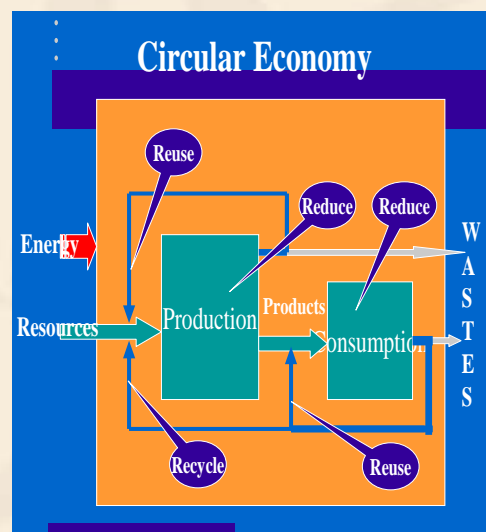
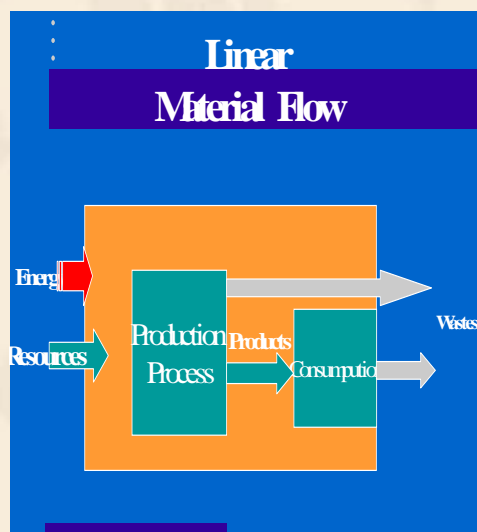
# Economic and Environmental Benefits

Lower Energy Bills

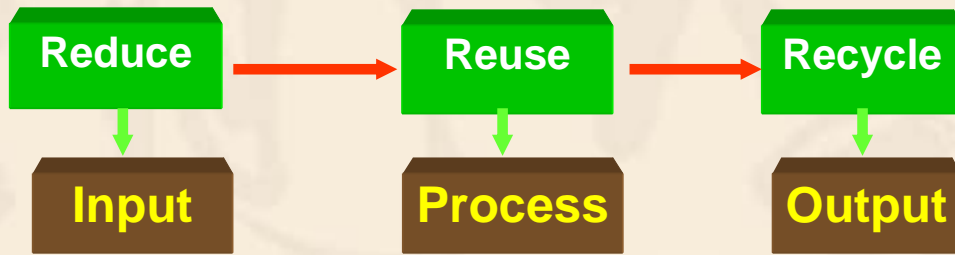
Lower Water Bills

Cost Savings from lowering  
Waste Volume  
Raw Materials  
O&M Costs  
Transportation Costs  
Reduction of Pollutant Emission

**Circular Economy is the solution: an integrated and innovative approach**



## **“3R” Principles of Circular Economy**

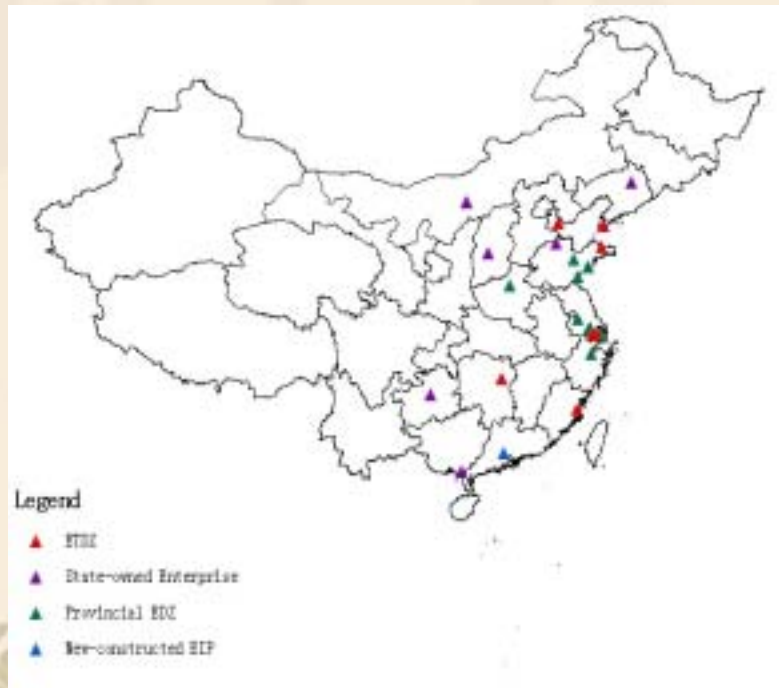


**Reduce is the priority  
Non-toxic and non-hazardous effects**

## **Circular Economy at Three Levels**

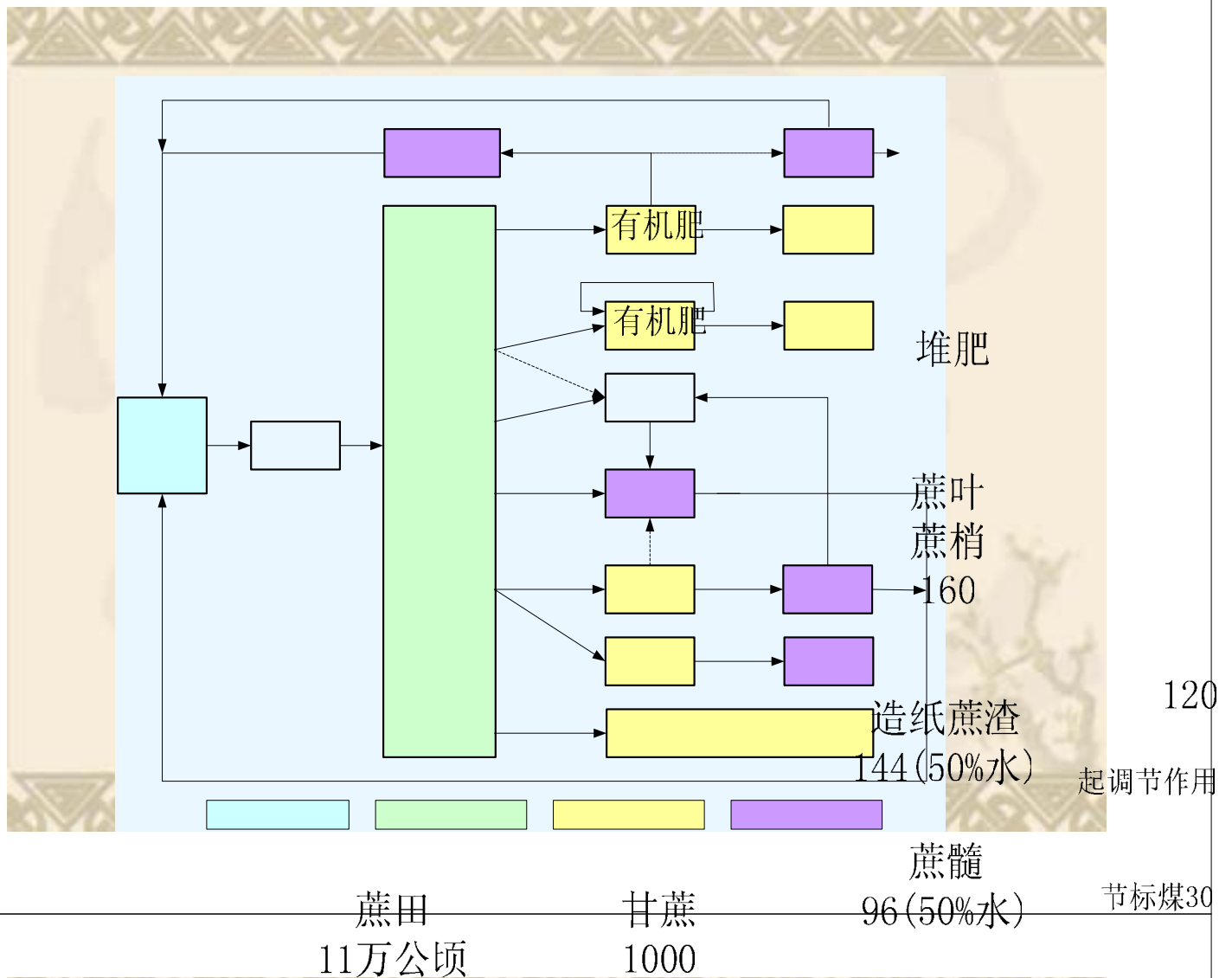
- ❖ **Inside factories or enterprises----**  
**Cleaner production ;**
- ❖ **A set of factories or enterprises----**  
**Eco-Industrial Park ;**
- ❖ **Production and consumption----**  
**Recycling oriented society**

## National Demo EIPs Approved by SEPA

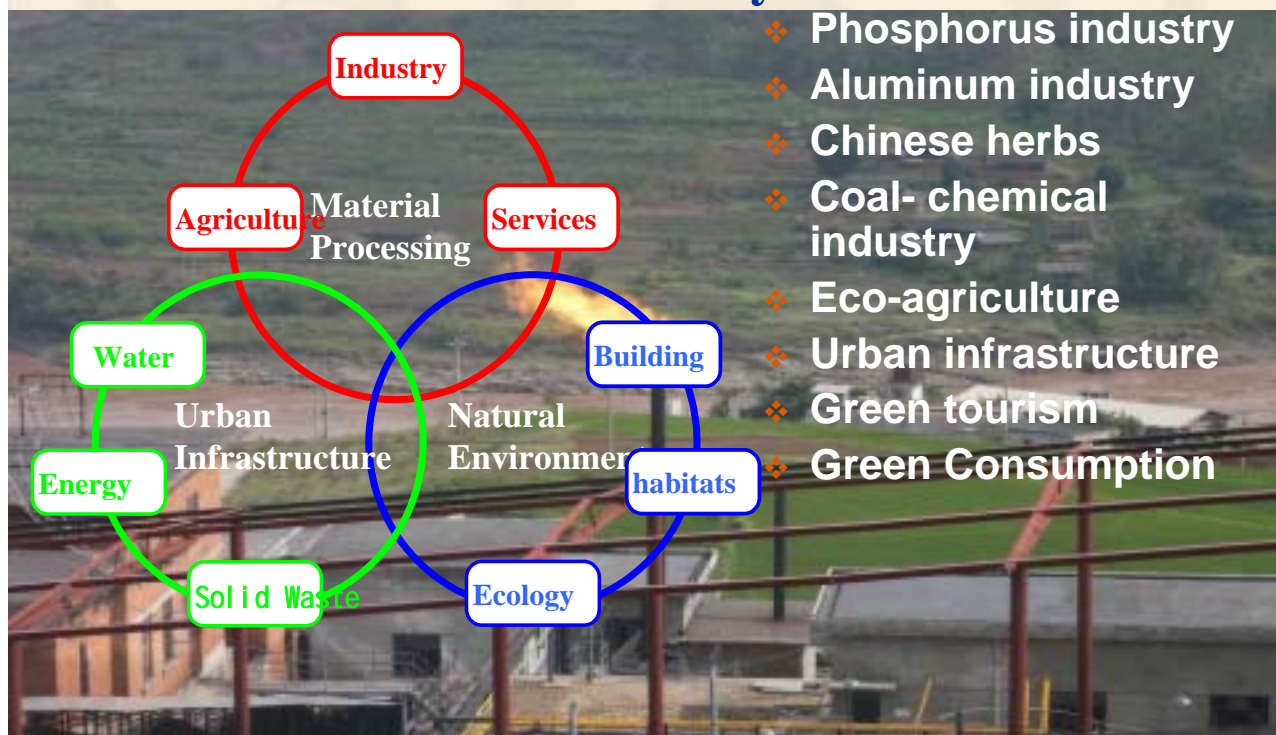


## Three cycles in Iron and steel complex

- ❖ Emissions -----electricity production
- ❖ Wastewaters -----recycling
- ❖ Solid wastes -----producing cement and other products



## Experiences in Guiyang City : Build Eco-city through The Implementation of Circular Economy



# Jiangsu Province Circular Economy

**To change industrial development pattern**

**Policy for supporting Eco-industries**

**Government - Enterprises – Public partnerships**



## CE practice in Shanghai

- ( 1 ) Eco-agriculture
- ( 2 ) Recycle and reuse industrial wastes
- ( 3 ) Recycle and reuse municipal garbage
- ( 4 ) Recycle and reuse construction wastes
- ( 5 ) Minimization of package
- ( 6 ) Development of secondary products market
- ( 7 ) Recycle and reuse wasted automobiles
- ( 8 ) Laws and regulations on CE
- ( 9 ) Study on foreign experiences

## Targets of 11th Five-Year Plan (2006-2010)

- ❖ GDP growth rate +7.5% per year
- ❖ Energy consumption per unit GDP -20%
- ❖ COD Emission -10%
- ❖ SO<sub>2</sub> Emission -10%
- ❖ Renewable energy up to 15% by 2020

## Circular economy is challenging but feasible

- ❖ Less resources intensive economic growth: **decouple resource input with economic growth**
- ❖ Harmonize development and environment for a sustainable future
- ❖ Make resources supply more secure and safer
- ❖ Better pricing and taxation to balance supply and demand



# The circular economy essentials

- ❖ **Commitment:** strong, effective, timely decision-making
- ❖ **Integration:** resource with agriculture, industry, environment, housing, transportation etc
- ❖ **Comprehensiveness:** all sectors, all needs, all supply links
- ❖ **Coordination:** horizontally in the central government, vertically with provinces
- ❖ **Enforcement:** to ensure national objectives are achieved
- ❖ **Continuity:** sustainability is a long term project; it must be embodied in law

# Conclusions

- ❖ **Circular economy is the new pattern towards sustainable development in China.**
- ❖ **There is long way to go for building a resources conservation and environmental friendly society in China.**
- ❖ **There is urgent need for study and application of industrial ecology in China.**



**Thank you !**