



# CIRCULAR ECONOMY

*An alternative model for economic development*

UNITED NATIONS ENVIRONMENT PROGRAMME





**PRODEV: Supporting the circular economy development of Guiyang**

## The Global Challenge of Sustainable Consumption and Production

Governments around the world are facing the challenge of addressing unsustainable patterns of consumption and production. Despite limited improvements in energy efficiency and resource productivity in recent years, overall resource consumption and waste has continued to increase. Within this context, the Chinese government is aiming to maintain rapid economic growth over the coming decades while simultaneously improving environmental quality and maintaining social progress. It is widely recognised that these ambitious objectives cannot be met without employing innovative development pathways rather than conventional approaches taken in many developed countries. The Chinese 'Circular Economy' initiative is a Sustainable Consumption and Production (SCP) program that strives to meet these challenges through cleaner production, industrial ecology and life-cycle management

## Why adopt a Circular Economy?

With a rapidly growing population reaching 1.8 billion by 2050 demanding for a better life: jobs, higher income as well as better environment to live in, the pressing need for sustainable development has become a high priority on the agenda of the central government.

## What is a Circular Economy?

A Circular Economy is an economy which balances economic development with environmental and resources protection. It puts emphasis on the most efficient use and recycling of resources, and environmental protection. A Circular Economy features low consumption of energy, low emission of pollutants and high efficiency. It involves applying Cleaner Production in companies, eco-industrial park development and integrated resource-based planning for development in industry, agriculture and urban areas. The Circular Economy was adopted by the Chinese Government in the last five year plan as the development model for China to follow.

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Over the past 25 years, while China has enjoyed an average annual growth rate of 8.7 per cent, the country's economic achievements have been largely gained through a high consumption of resources and ecological degradation (polluted rivers, cleared mountains, depleted soil, and coal and sites full of toxic materials). To meet the needs for development while restoring the health of ecosystems, China must follow a development different from the industrialization model of the West. The Circular Economy is one response to this situation.

### How to achieve a Circular Economy?

The National Development and Reform Commission (NDRC) in China is leading the Circular Economy strategy at the national level. Under the NDRC's guidance, a circular economy will be achieved through a score of legislative, political, technical and financial measures. Many of these are powerful policy instruments, such as government regulations, subsidies and tax breaks.

The main barriers to implement a circular Economy include:

- Lack of knowledge and experience of the local officials and citizens on how to move from theory to on-the-ground implementation of the Circular Economy approach
- Insufficient environmental policies, weak planning guidelines, and inadequate coordination between different parts of the authorities and other sectors in society

### Population and Ethnic Groups

Guiyang has a population of 3,508,500 (Dec 2004), among which 2,218,300 were urban inhabitants representing 63.23 % of the total (2005 Guiyang Statistical Yearbook). 38 minority ethnic groups such as the Miao and the buyi live in Guiyang. The main ethnic group is the Han.

### Climate

Guiyang enjoys a warm and humid subtropical climate. The average temperature is around 23.1°C in August, 7.9°C in early January.

### City of Forest

Guiyang is often called a city of forest as 34.77% of its administrative area is covered by forest (2793.33 square meters forest coverage).

### Mineral Resources (2005 Guiyang Statistical Yearbook)

Abundant reserves of high grade, concentrated mineral deposit, and easy access characterise the mineral resources in Guizhou. Guiyang possesses more than 52 kinds of mineral deposits, such as aluminum, phosphorus, coal, iron, magnesium, silicon, heavy spar, dolomite, limestone, marble and Kaolin. The reserve of

Guiyang is a city of over three million inhabitants located in the southwest part of China. It is an underdeveloped region with an urgent need for development, has great potential for exploring alternative development models. Guiyang was chosen by the Government as a pilot city for evolving an implementation methodology for the Circular Economy.

### Overview of Guiyang Geographical Location

Guiyang, the capital of Guizhou Province, is the provincial center of politics, economy and culture. It has a total area of 8034 square kilometers and is characterized by low altitudes, high sea level, and varied topography.





bauxite is 3300,000,000 tons, which is one fifth of the total reserves in China. With a reserve of 428,000,000 tons of phosphorus, it is also one of the three biggest phosphorus deposits in China.

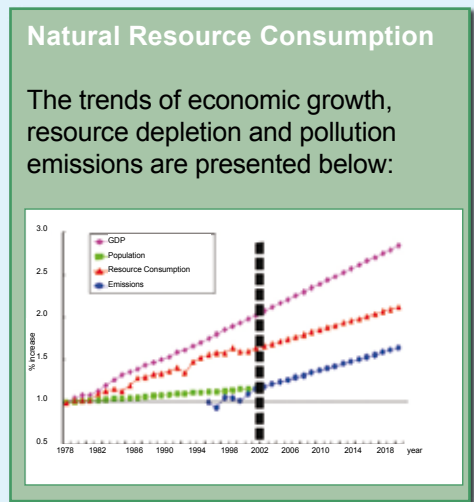
### Main Environmental issues

With a rapid increase in investment and expansion of economic activities, the damages to the environment and ecosystems are reaching an alarming level:

- Mining and primary processing of mineral resources, mainly coal, phosphorous and bauxite directly interferes with the natural landscape, flora and fauna around the operations. Mining activities have caused increased landslides and geological disasters. Equipped with low efficiency technologies and inadequate management practices, these activities emit significant amount of pollutants that create

additional burden to the ecosystems. The average acidity level of rainfall in 1997 was PH 4.88 and 36% of the rainfalls had high acidity.

- Agricultural activities in Guiyang contribute only up to 10 % of GDP, but comprise 40% of total employment. Land is scarce and intense farming activities weigh heavily on the natural resources of the rural areas: 17% of the land suffers from desertification and 32.5% suffers soil and water losses (erosion).
- A traditional farm produces mostly grains (maize, rice) grown in small plots in the mountain area. The financial return of current agricultural production systems does not bring the rural population out of poverty, nor will it restore health to the ecosystem.
- Poverty and unemployment are exerting increased pressure on the local population. The average income of rural population (more than half of total population) is US\$ 0.74 per day and 520,000 people are living on less than US \$0.5 per day.





### Guiyang Circular Economy

The city government is committed to exploring the Circular Economy approach and launched a Mayor-led effort in 2002, which resulted in the adoption of the Guiyang Circular Economy Development Plan. The plan has set sustainable economic development goals and has laid out a road map for achieving these goals by focusing on six sectors; coal-based industry, phosphorus-based industry, aluminium industry, herbal medicine, tourism and organic agriculture. To implement this plan, a significant shift in government policy and economic system is required.

### Prodev

Prodev is a project financed by the European Commission, coordinated by the United Nations Environment Programme and carried out in partnerships with the Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production (CSCP) and the Municipal Government of Guiyang.

### Project objective

To improve the policy framework and promote a more integrated decision making process in the local government to support sustainable development and Circular Economy.

### Expected project outcomes

- Implementation and adoption of pilot policy measures supporting a Circular Economy/SCP approach in Guiyang
- A tested and proven approach for implementing Circular Economy/SCP approaches that can be applied in other Chinese municipalities and regions
- The introduction and dissemination of European experiences and best practices most suitable to China. The knowledge obtained through training workshops on various policy instruments will enable the government to effectively promote the economic development while reducing environmental impacts and social problems.

- Improved know-how and linkages between European and Chinese decision makers on how to pursue sustainable development

### Project output

- Detailed policy framework study on leading practices and local conditions in Guiyang, China
- Policy gap report
- Circular Economy development action plan report
- Capacity building training workshop for over 40 Guiyang policy makers as well as supporting information materials in English and Chinese language versions
- Guide for Chinese trainers with training methodology in English and Chinese language versions (at least 40 trained policy-makers in Guiyang local government, 10 trained policy-makers in Chinese national government and 10 trained trainers from Chinese public administration and policy institutes)
- Awareness raising throughout Asian countries (Asian Mayors conference,

- APRSCP etc)
- Development of a toolbox of leading Circular Economy/SCP policies and tools which can be applied in developing countries in Asia and beyond

### Project partners and relevant web sites

UNEP has been working closely with the Guiyang government to find means to achieve this decoupling through implementation of a “circular economy”. The project involves cooperation with the central government in Beijing, notably the State Environmental Protection Agency, and the National Development Reform Commission, which is coordinating efforts to design more sustainable models of economic development. Project partners are:

### Guiyang Circular Economy Office, Guiyang Municipal People's Government

The Guiyang Circular Economy office is responsible for leading the building of Guiyang Circular Economy and Ecological City. Composed of four departments (general affairs, science & Technology Publicity Laws & Regulations, Project development and



Science development, and International Liaison & Cooperation), the office's major responsibilities include the planning, fundraising, funds monitoring, awareness raising of Guiyang CE related activities.

<http://www.gyce.cn> (in Chinese)

### UNEP/Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production (CSCP)

The CSCP is a Collaborating Centre on Sustainable Consumption and Production provides scientific support to SCP activities undertaken by UNEP and other organisations. This support includes the development, testing, implementation and monitoring of concrete projects, especially in developing countries, which will enable these countries to leapfrog to sustainable consumption and production patterns using life cycle thinking and regional perspectives as guiding principles.

[www.scp-centre.org](http://www.scp-centre.org)

### The European Commission

The European Commission's Asia Pro Eco Programme is designed to

strengthen the environmental dialogue between Asia and Europe through the exchange of policies, technologies and best practices that promote more resource-efficient, market driven, and sustainable solutions to environmental problems in Asia. The programme aims to support a series of preventive and corrective actions, which materialise in technical solutions that contribute to both quality of life and economic prosperity in Asia.

<http://ec.europa.eu>

### United Nations Environmental Programme (UNEP)

The United Nations Environment Programme provides leadership for the protection of the environment by inspiring change, informing stakeholders, encouraging partnerships and enabling nations and people to improve their quality of life without compromising that of future generations. UNEP's Division of Technology, Industry and Economics (DTIE) works with governments and various industries to achieve responsible behaviour, positive investment and a cleaner environment.

<http://www.unep.org>

## About the UNEP Division of Technology, Industry and Economics

The UNEP Division of Technology, Industry and Economics (DTIE) helps governments, local authorities and decision-makers in business and industry to develop and implement policies and practices focusing on sustainable development.

The Division works to promote:

- > sustainable consumption and production,
- > the efficient use of renewable energy,
- > adequate management of chemicals,
- > the integration of environmental costs in development policies.

**The Office of the Director, located in Paris, coordinates activities through:**

- > **The International Environmental Technology Centre** - IETC (Osaka, Shiga), which implements integrated waste, water and disaster management programmes, focusing in particular on Asia.
- > **Production and Consumption** (Paris), which promotes sustainable consumption and production patterns as a contribution to human development through global markets.
- > **Chemicals** (Geneva), which catalyzes global actions to bring about the sound management of chemicals and the improvement of chemical safety worldwide.
- > **Energy** (Paris), which fosters energy and transport policies for sustainable development and encourages investment in renewable energy and energy efficiency.
- > **OzonAction** (Paris), which supports the phase-out of ozone depleting substances in developing countries and countries with economies in transition to ensure implementation of the Montreal Protocol.
- > **Economics and Trade** (Geneva), which helps countries to integrate environmental considerations into economic and trade policies, and works with the finance sector to incorporate sustainable development policies.

*UNEP DTIE activities focus on raising awareness, improving the transfer of knowledge and information, fostering technological cooperation and partnerships, and implementing international conventions and agreements.*

For more information,  
see [www.unep.fr](http://www.unep.fr)

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*The Government of the People's Republic of China has set a development target for 2020 of quadrupling the GDP and in parallel improving environmental quality and protecting natural resources.*

*Initiated in late 2005, the PRODEV project is assisting the Guiyang local government to implement a circular economy through identifying policy gaps, and developing tailor-made training materials for policy makers.*