

Situation and Trends of China's Rural Energy Consumption

Global Environmental Institute (GEI)

JIN Jiaman

June 29 , 2010

<http://www.geichina.org>

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The consumption of non-commercial energy 2001-2008

- **Non-commercial energy includes: straw, wood, marsh gas, solar energy, small windmills and minor hydro-power generators**

The consumption of non-commercial energy in rural area 2001-2008 (10,000 tons of standard coal)

	2001	2008	Annual growth (volume)	Annual growth (%)
Straw	13080.77	7510.05	-5570.72	-43%
Wood	9757.28	4738.22	-5019.06	-51%
Marsh gas	220.00	720.82	500.82	228%
Solar energy	159.20	620.56	461.36	290%
Wind energy	0.0002813	0.0003855	0.0001042	37%
Hydro power	0.0021255	0.0022652	0.0001397	7%
Total	25218.2524068	15597.6526507	-9620.5997561	-38%

- The consumption of non-commercial energy declines between 2001 and 2008.
- Straw and wood consumption have declined 43% and 51% within this period. Marsh gas, solar, wind and hydro energy have increased, especially marsh gas and solar energy, for 228% and 290%. However, the base for comparison in 2001 was too low, so the significant growth of them couldn't affect the main trend much.

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The consumption of commercial energy 2001-2008

- **Commercial energy: coal, electricity, oil, natural gas, coal gas and liquefied petroleum gas**

The consumption of commercial energy in rural area 2001-2008 (10,000 tons of standard coal)

	2001	2008	Annual growth (volume)	Annual growth (%)
Coal	13784.75	15971.58	2186.83	16%
Electricity	879.8891	1280.52	400.63	46%
Oil	1302.27	3270.22	1967.95	151%
Natural gas	23.41	37.33	13.92	59%
Coal gas	12.97	17.54	4.57	35%
Liquefied petroleum gas	421.99	12830.31	12408.32	2940%
total	16425.2791	33407.50	16982.22	103%

- The total growth rate is at 103% between 2001 and 2008.
- The main contributor of growth comes from oil and liquefied petroleum gas, at 151% and 2940% respectively

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Energy consumption in China's rural area 2001-2008

Situation:

- Growth of 103% / 169,820,000 tons of standard coal of commercial energy
- Decline of 41% / 96,280,000 tons of standard coal of non-commercial energy

Main concern:

Total (non) commercial energy consumption increase of 62% between 2001 and 2008 in rural China

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Comparison of rural and urban consumption of energy per capita

comparison of rural and urban consumption of commercial energy per capita 2001-2007 (1 ton standard coal)

	2001	2002	2003	2004	2005	2006	2007
Rural	82	87	99	109	122	131	138
Urban	213	216	237	243	257	275	282

Situation:

- 9 tons of standard coal / annual growth of 9% for rural consumption of commercial energy per capita between 2001 and 2007
- 12 tons of standard coal / annual growth of 5% for urban consumption of commercial energy per capita between 2001 and 2007

Main concern:

The growth rate is higher in rural area than in urban area

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Statistics and trends of rural and urban population 2001-2020

Population (10,000)

	2001	2002	2003	2004	2005	2006	2007	Annual growth	2012	2020
Urban	48064	50212	52376	54283	56212	57706	59379	1886	68808	83895
Rural	79563	78241	76851	75705	74544	73742	72750	-1136	67073	57989
total	127627	128453	129227	129988	130756	131448	132129	750	135881	141883

statistics :

- The annual growth of China's urban population is at 18.86 million. Estimation for 2012 and 2020 are at 699.08 million and 838.95 million respectively.
- China's rural population has an annual decline of 11.36 million. Estimation for 2012 and 2020 are at 670.73 million and 579.89 million respectively.

Main concern:

By 2020, 150 million of rural population would move to the urban areas, which would lead to growth of consumption of commercial energy.

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Estimation of China's rural household commercial energy consumption per capita

Trend of rural household commercial energy consumption per capita (1kg standard coal)

	2001	2002	2003	2004	2005	2006	2007	2012	2020
Rural	82	87	99	109	122	131	138	183	259
Population (10,000)	79563	78241	76851	75705	74544	73742	72750	67073	57989
Total	6522477	6839593	7605971	8245137	9094368	9660202	10018800	12274359	15019151

According to the annual growth rate of 2001 and 2007, the average commercial energy consumption would reach 183kg standard coal per capita in 2012 and 259kg in 2020. The total consumption will be 122.7 million and 150.2 million kg standard coal in 2012 and 2020 respectively.

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Estimation of urban (shifted from rural) household commercial energy consumption per capita

Urban (shifted from rural) household commercial energy consumption per capita (kg standard coal)

	2004	2005	2006	2007	2012	2020
Urban	243	257	275	282	342	432
Population shifted from rural to urban (10,000)		21733.70	1094.06	999.94	19130.73	49739.91
Total		5585560.90	300866.50	282421.49	6542709.66	21487641.12

Based on the annual growth rate between 2001 and 2007, the population moved from rural to urban, would have a total consumption of 65.4 billion and 214.9 billion kg of standard coal in 2012 and 2020 respectively.

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Solutions to the growth of energy consumption in rural area

- Promote and increase the use of non-commercial energy (marsh gas, energy saving cookers, solar cookers)
 - testing on products
 - recommend products and technology to rural population
 - consumer training among rural population
 - build up marketing, maintenance and consultation channels
- To build up a voluntary carbon market (with a French NGO partner's office in Laos)
- Policy recommendation (Ministry of Agriculture, National Development Reform Commission)

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Introduction

- NGO founded in 2004
- Mission: to design and implement market based models for solving environmental problems; Ecologically, Economically, Socially Sustainable
- Project Sites

China: Beijing, Sichuan, Yunnan, Tibet, Guangdong, Guangxi, Henan, Qinghai

Overseas: Laos, Sri Lanka



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Donors

- Asia Foundation
- Blue Moon Fund
- Defra-DFID (UK)
- Energy Foundation
- European Union
- Fiorello H. Laguardia Foundation
- Goldman Sachs
- Hewlett Foundation
- OECD
- Renewable Energy and Energy Efficiency Partnership
- Rockefeller Brothers Fund
- Toyota



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GEI Programs

- Energy Efficiency & Climate Change
- Biodiversity & Rural Development
- Capacity Building (Stakeholder, Enterprise, Farmer)

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Review: Climate Change



CDM Training in China



US-China Track II Dialogue on Climate Change



Cement Industry Waste-Heat Recovery and CDM (DEED)



Study on the Impacts of Rural Energy on Climate Change



Comments on China's CC White Paper

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Outlook: Climate Change

- **China-US Climate Cooperation**

- Capacity building
- Action Planning Pilot (Guangdong)
- Scale-up: Energy efficiency in industry
- Research: Rural energy in China



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GEI Project Impacts Within & Beyond China

- **Government**
- **Community Livelihoods**
- **Industry/Enterprises**
- **Energy Technology**
- **Resource Extraction**

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Thank You!

