



**农业农村部农业生态与资源保护总站**

**Rural Energy and Environment Agency, Ministry of Agriculture and Rural Affairs, P.R.China**

# **Development and Utilization of Biomass Energy in Rural China**

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# Content

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**Current Situation**

**Typical Cases**

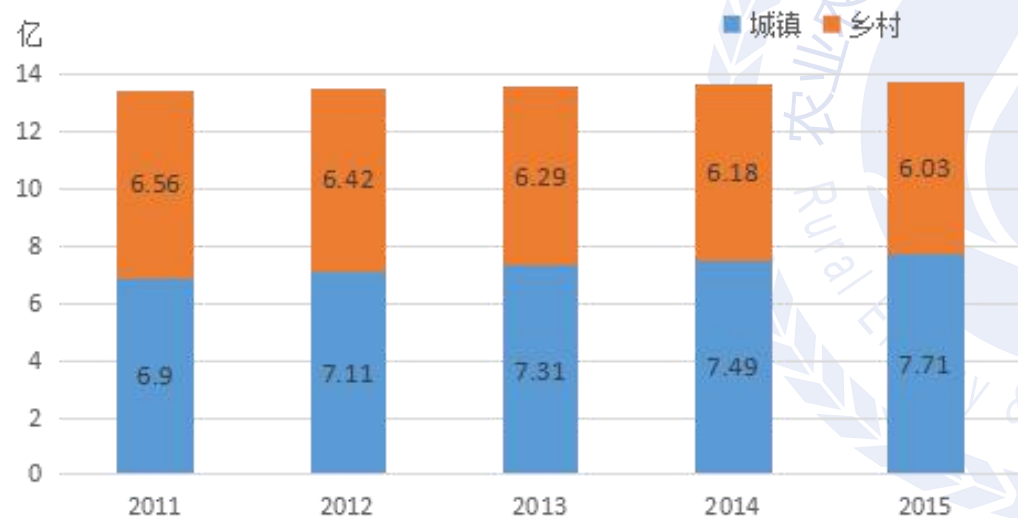
**Future Development Trends**

**EZCERTV Project Concept**



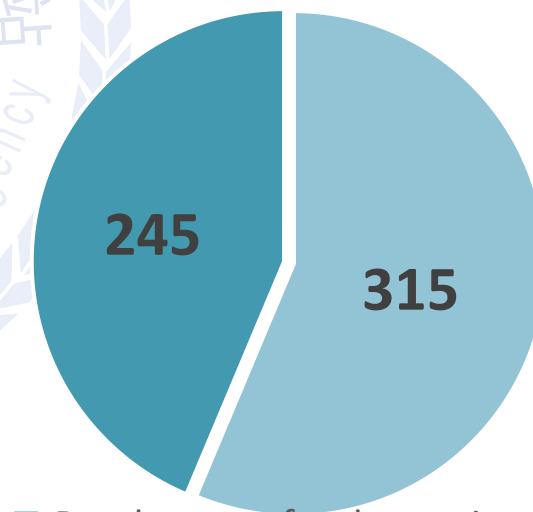
## The Present Status and Ways of Using Energy in Rural China

- At present, there are 39,700 towns in China, with 160 million rural households and a total population of 603 million, accounting for 43.90% of the total population.
- Rural areas are dominated by decentralized heating
- China's energy structure is rich in coal, poor oil and little gas and energy consumption is dominated by coal.



历年中国城镇与农村人口

Structure of Energy Use in China's Rural Areas

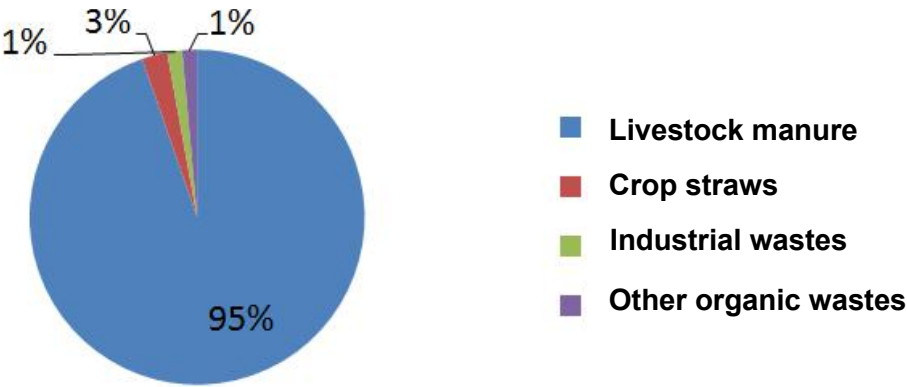


■ Rural energy for domestic use  
■ Rural energy for productive use

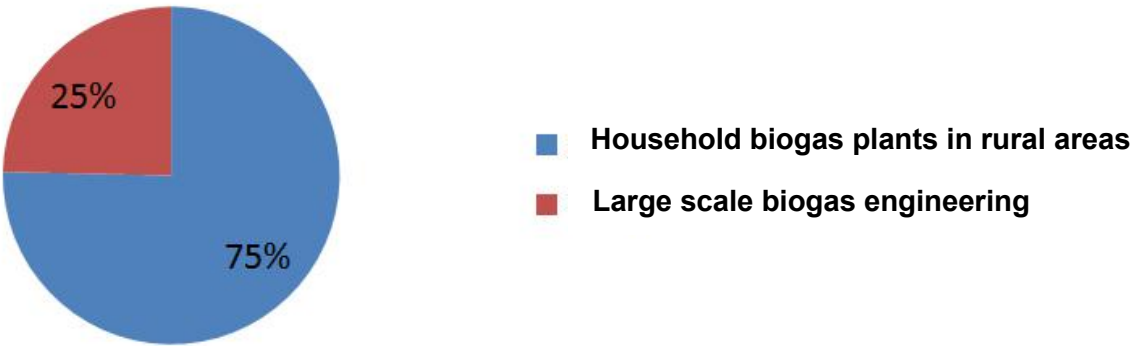
unit: million tons of standard coal



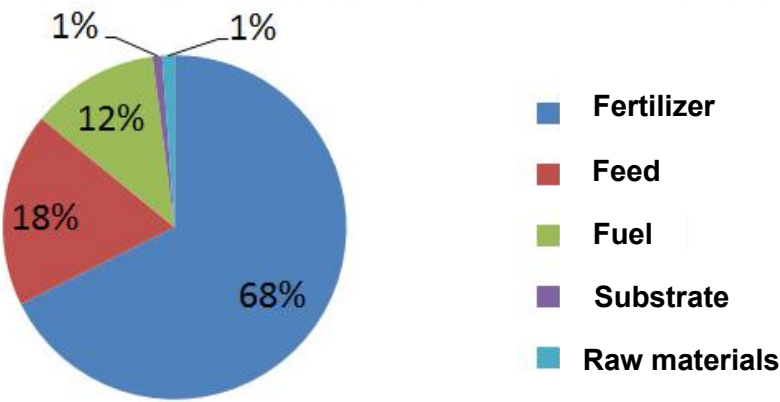
Amounts of feedstocks for biogas plants  
(212 million tons)



Biogas production  
(111.75 billion m³)



Amounts of crop straws for comprehensive utilization  
(753 million tons)



Fire wood and coal saving stoves and kangas  
(144 million)





## **Baseline of China's Rural Biomass Energy Policy**

During the 13th Five-Year Plan period, China has successively issued a number of policies to support the development of rural biomass energy.

**Opinions on Accelerating the Resource Utilization of Livestock and Poultry Breeding Waste**

**Comprehensive Development and Utilization of Biogas to Enjoy the Corporate Income Tax "Three Exemptions and Three Half Reduction"**

**Guidance on Promoting the Industrialization of Biogas**



## Model for household biogas

- There are nearly 27 million households using traditional biogas digesters in rural areas with the characteristic of 3 upgrades (upgrade in kitchen, pigsty, and toilet), and the average annual gas production is about 340 cubic meters.







## Model for biomass-formed fuels addressing heating in winter in the whole county

(Yangxin County, Shandong Province)

In 2018, all of the county's clean heating was supplied in biomass mode, carried out 398 villages with 25,034 households, and achieving full coverage in 1 township. The mode will promote the application of 500,000 tons of biomass-formed fuel per year, replacing 350,000 tons of standard coal and reducing carbon dioxide emissions by 660,000 tons per year.





## Jing'an's efficient industrial model for fertilizer and energy in suburban areas

(Anping County, Hebei Province)

Relying on the advanced technology of utilization of agricultural and animal waste resources, Jing'an Co., Ltd. manages livestock and poultry manure, straw and other agricultural and livestock waste in Jing'an farm and Anping County comprehensively, promoting the formation of four products such as biogas, green electricity, centralized heating and organic fertilizer. The annual power generation capacity of Jing'an is 1,512 kWh; the annual biogas production is 11.52 million cubic meters with purifying bio-nature gas 6,360,000 cubic metres, which can be used for heating and cooking by 8,595 households in the surrounding area; there are 850,000 tons of animal and poultry manure treated per year, 70,000 tons of straw absorbed per year, and 108,000 tons of CO<sub>2</sub> emission reduced per year.







## Model for environmental protection and energy development in Erhai Lake (Dali, Yunnan Province)

Yunnan Erhai Environmental Protection Co., Ltd. has established nearly 30 collection stations for organic waste such as livestock and poultry manure, cyanobacteria, etc. in Erhai basin, collecting 350,000 tons of organic waste annually for energy production. The Erhai Super-large bio-gas project can produce 10.5 million cubic meters of natural gas every year and supply for 1,500 taxis.







## Model for biomass-formed fuels and straw baling direct combustion addressing heating in winter in rural public institutions

(Hailun County, Heilongjiang Province)

In order to make effective use of straw resources, take Haibei primary school as an example, whose heating area is 4,823 square meters. In previous years, 180 tons of raw coal was used, which cost 135,000 yuan. In 2017, one biomass energy-saving boiler was replaced, and 160 tons of biomass fuel was used, which cost 96,000 yuan and saved 39,000 yuan.





## Model for straw baling direct combustion addressing villagers' heating in winter

(Changzi County, Shanxi Province)

The construction of the biomass heating station in Nancheng Village began on August 1<sup>st</sup>, 2018, with a total investment of ¥15.55 million to complete clean heating reconstruction of 963 households, renovation of heating area of 81,500 square meters, in 2019.

Based on an average consumption of 5,000 bales of straw (about 10 kg per bale), it is possible to meet the consumption of the heating station for 100 days and the indoor temperature can be maintained at 18~21 °C.







## Model for small-scale pig farms addressing the cooking energy in the village

(Santai County, Sichuan Province)

The Mingxing Live Pig breeding cooperative of Santai County provided biogas for 100 households in Qinshan Village. By promoting the circulation of planting and breeding gardens, using pipelines and slag extraction trucks to transport biogas slurry to irrigate Ophiopogon. In the price competition between rural biogas and natural gas, biogas is more popular because it is better and cheaper.







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# Future Development Trends of Rural Biomass

**Explore to establish rural distributed clean energy technologies system with the core of full using and developing bio-energy**



**Explore to establish a new sustainable development mechanism with market leading and green ecological compensation from governments as subsidiary**





## ● Enabling Zero Carbon Energy in Rural Towns and Villages in China Project

This is based on the improved development and utilization of renewable energy resources in rural areas, adopting energy storage technology and integrated energy management and energy efficiency technologies/techniques to meet the increasing energy demand in rural areas, accelerate the rural energy transformation, and lead to the development zero carbon towns and villages in rural China.

**National Determined  
Contributions Targets**

**Global Climate  
Change Mitigation**

**Rural Revitalization**

**United Nations  
Sustainable  
Development Goals (SDG)**







## Zero Carbon Village



Photovoltaic Power Generation



Wind Power



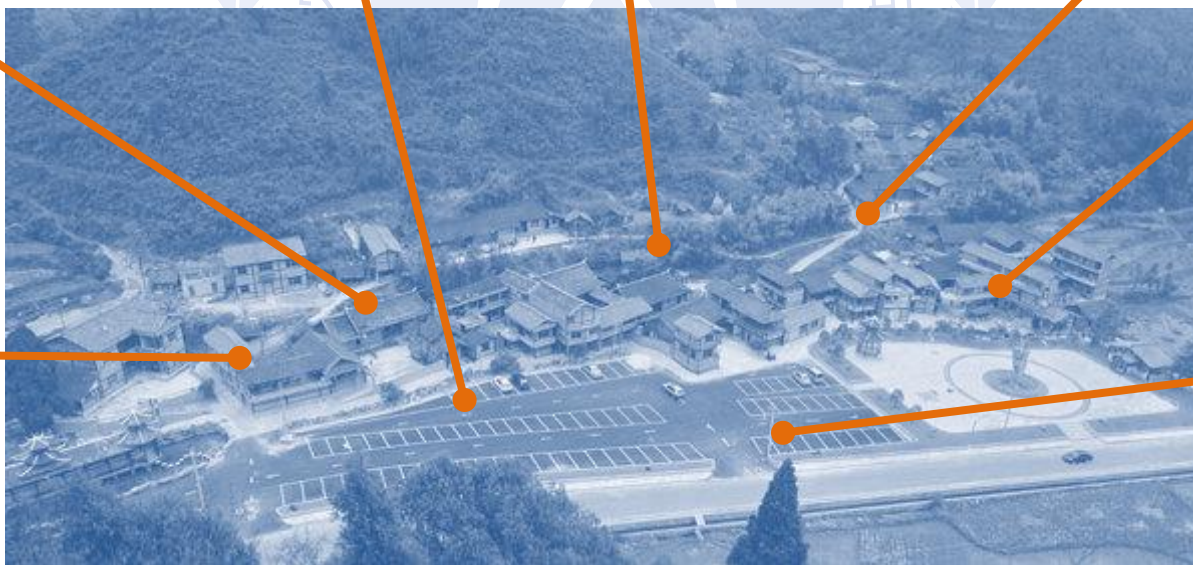
Straw Direct-fired Boiler



Street Lamps



Optical Storage Charging Station



Solar Thermal Utilization for Bathing



Bio-nature Gas



Thank you

