

Current Situation and Prospect of Rural Energy Development

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Abstract: Rural energy is one of the important components of energy system in China and the important material foundation of building beautiful countryside. Coal plays a leading role in rural energy consumption, the coal consumption in rural life energy accounts for 33.8 percent, and the coal consumption in rural production and energy use accounts for 1.5 percent. The current situation of energy development is unreasonable. Rural energy industry development started, but the technical level is low. In addition, the use of renewable energy is relatively low, the current energy consumption in rural areas is unreasonable, causing great harm to the environment, the development of new energy has become the general trend of rural energy development at the present stage.

1 INTRODUCTION

In order to understand the development of energy in rural areas, promote the development of rural energy economy, and realize rural poverty alleviation. From the current situation of rural energy development, industrial status, rural energy utilization, the development of new energy, and so on.

First, the current situation of energy use in rural areas is unreasonable, the rural energy industry has started and developed steadily and the regionalization of industrial scale.

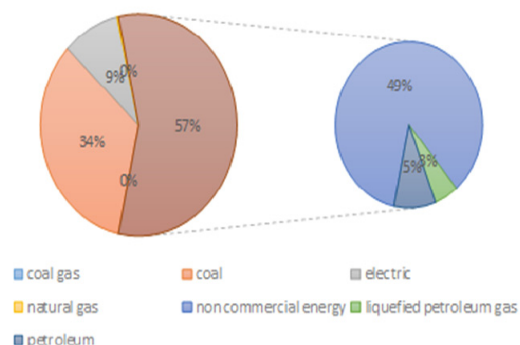
2 CURRENT SITUATION OF RURAL ENERGY CONSUMPTION

2.1 Rural Energy Production and Consumption System

Rural energy supply and demand system includes two aspects of rural energy consumption and production, while energy consumption mainly includes living energy and production energy. Among them, life energy includes cooking, heating, lighting, etc. production energy includes planting,

breeding and primary processing of agricultural energy, etc. Rural energy supply includes external commodity energy input and internal energy development in rural areas. Energy development in rural areas includes the development of various renewable energy sources, such as fuel ethanol, biodiesel, briquettes and other renewable energy sources such as hydro, wind, solar and geothermal energy, as well as fuelwood. Development of traditional biomass energy such as straw and direct combustion. The internal energy of rural areas also has both commercial and non-commodity energy, even the same kind of energy may be both as commodity energy and non-commodity energy, such as biogas, solar energy and so on. In general, the proportion of non-commodity energy consumption in rural life is still very large, accounting for the largest proportion is coal, straw, fuelwood and so on. The consumption of coal is dominant and the consumption of clean energy and renewable energy is relatively small. It can be seen that the current consumption structure of energy consumption in rural areas is unreasonable, like Fig.1.

National Consumption Structure for living



Note: the data is the statistical data of rural energy & environment agency, ministry of agriculture, unit 10000 tons standard coal, the following picture is the same.

Fig.1 .National Consumption Structure for living.

2.2 Current Situation of Energy Consumption and Production in Rural Areas

Commodity energy accounts for a large proportion of rural energy consumption, in which the largest proportion is coal, refined oil, electricity and so on. Rural production and energy use is basically dependent on the national unified energy supply system. But on the whole, the rural production of energy-using coal is dominant, and the clean energy and renewable energy are relatively low, like Fig.1.

NATIONAL RURAL ENERGY CONSUMPTION STRUCTURE

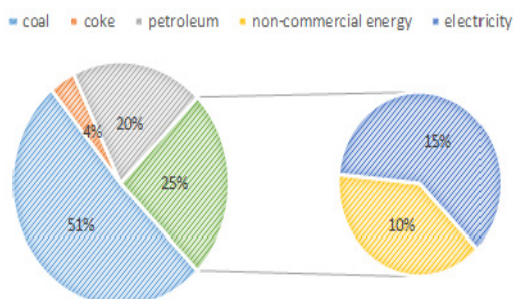


Fig.2 National Rural Energy Consumption Structure.

2.3 Regional Characteristics of Energy Use in Rural Life

The most important factor affecting the total energy use in rural areas is the number of population, in

addition, it is also related to the conditions of regional temperature, the level of economic development, the living habits of farmers and so on. The proportion of commodity energy is mainly restricted by regional economic conditions and energy resource endowment.

3 CURRENT SITUATION OF RURAL ENERGY INDUSTRY

Rural energy production in China mainly includes biomass energy development (biogas, direct-fired power generation, briquetting fuel, applied scientific fuel, ect.), solar thermal utilization (solar water heater, heat pump, solar house, ect.) Solar cooker and so on, small power (including off-grid solar photovoltaic, off-grid small wind power generation and so on. In recent years, the rural energy industry has shown a good development trend in general, the biomass energy and the forming fuel industry technology have made great progress. The biogas industry has entered the stage of transformation and upgrading, the solar energy utilization industry continues to keep steady development, and the small power industry is in the ascendant, like Tab.1.

Tab.1 Biogas engineering and household biogas production in China.

Region	Region Biogas project			
	Quantity/10 ⁴	Total pool capacity/10 ⁴ m ³	Gas production/m ³	Power generation/10 ² KW.H
Beijing	124	8.59	2429.88	87.6
Tianjin	433	5.27	1427.32	275.09
Hebei	2920	46.69	9086.52	2382.2
Shanxi	412	9.14	2339.99	20
Neimeng	484	15.08	2636.1	2571.75
Liaoning	1165	38.12	3138.9	71.76
Jilin	59	2.25	545.65	0
Heilongjiang	1331	29.44	5072.41	1872.1
Shanghai	98	11.64	1993.48	1429.02
Jiangsu	4469	92.71	13902.6	7748.67
Zhejiang	12301	128.64	9934.85	1179.43
Anhui	2189	29.45	3495.12	1546.322
Fujian	5040	61.23	9310	209
Jiangxi	7071	132.63	9188.24	2450.47
Shandong	6813	116.27	17030.0	3119.18
Henan	5726	126.58	15163.4	872.6
Hubei	5832	70.5	8782.51	193.21
Hunan	21481	137.11	9338.33	1185.82
Guangdong	6504	179.54	17853.6	1604.32
Guangxi	854	20.57	2085.11	1161.32
Hainan	1651	38.64	9705.28	5125.24
Chongqing	3334	62.69	3298.02	1.3
Sichuan	6238	149.33	31452.1	4246.06
Guizhou	1891	32.5	3559.48	907.05
Yunnan	314	5	272.03	50.31
Xizang	11	0.39	21.27	0
Shanxi	2880	37.93	1364.24	123.99
Gansu	239	9.98	1762.73	1134.65
Qinghai	192	5.41	168	0
Ningxia	111	7.33	1391.75	554.18

Note: Data from Agriculture Department of Agricultural Ecology and Resources Conservation Summary Statistics.

3.1 Rural Energy Industry Scale

A、 Biomass power generation. Biomass energy generation is mainly distributed in the eastern coastal areas, with the most dense in East China, while the southwest region is restricted by resource endowment, topography and climate conditions, and biomass energy direct combustion power generation projects are reduced.

B、 Biogas. Biogas in China is in the critical stage of transformation and upgrading. The provinces with large capacity of biogas project are mainly Guangdong, Sichuan, Hunan, Jiangxi and so on, mainly distributed in the southern region of China. In recent years, affected by livestock farming patterns, changes in farmers' lifestyles, and the transfer of young rural labor, the phenomenon of stopping or inefficient operation of biogas in the whole country has become more common. The construction of socialized service system in operation and maintenance should not be ignored.

C、 Biomass briquetting fuel. It is mainly used in urban heating and industrial heating and other fields. Biomass briquetting fuel production scale is very small, mainly in the Yangtze River Delta, Pearl River Delta region industrialization demonstration effect is the best. Heating with biomass energy forming fuel is an important measure to prevent and control air pollution and reduce coal consumption, especially for heating in rural areas of northern China, which is one of the important directions for the development and utilization of biomass energy in the near future.

3.2 Rural Energy Calculation

At present, rural energy has not yet established a comprehensive, multi-dimensional technology research and development new system, the overall technological research and development innovation capacity is not strong, the level of technological development is still not high, especially in rural renewable energy development technology economy needs to be further improved.[1]

4 PROBLEMS IN RURAL ENERGY UTILIZATION

Energy efficiency is low, energy waste and shortage

coexist and investment is high. Especially in rural areas, solar energy utilization is more dispersed, off-grid solar power generation and off-grid wind power generation are rare, comprehensive utilization rate is not high. The investment of micro-hydropower is relatively high, but limited by geographical environment, the popularization rate is low. Especially in the use of biogas energy, is based on household units, decentralized investment, low degree of intensification. The overall utilization rate of energy is not high because of the scattered utilization of energy. Energy consumption exerts great pressure on environment. The demand for coal in most rural areas is still high, especially in the north. The development of small coal mines in some rural areas has increased the damage to the environment. Straw and firewood are still the main sources of energy for living in rural areas. The destruction of vegetation, the increase of air pollution, and the prevention of the atmosphere have brought great problems.

The legal system and the Government's Capital support are not enough in the Construction of New Energy in the Countryside. At present, the national legal system supporting measures in rural new energy construction is almost blank. It is urgent for governments at all levels to issue relevant legal documents, standardize all kinds of energy construction, and achieve a balance between the rational use of energy and the effective force of environmental protection.[2]

5 MEASURES TO PROMOTE RURAL ENERGY DEVELOPMENT

Develop energy resources in various regions according to local conditions. Due to the regionalization of energy consumption in various regions, we can develop energy according to the conditions of economy, climate, topography and so on, and realize the rational development of energy resources in different regions. For example, the region of Inner Mongolia and Xinjiang is suitable for developing wind energy, while the region of Tibet is suitable for developing solar energy, the northern region is suitable for developing coal energy, and the southern region is suitable for developing water energy.

To raise awareness of the importance of rural energy development. The state should launch talents, encourage scientific researchers to study energy problems, realize the high utilization of energy and

reduce the destruction of the ecological environment. At the same time, we should face the masses of the people, popularize the knowledge of rural energy science, improve the awareness of energy conservation and environmental protection, stop the farmers from cutting down and incineration.

Increase investment in rural energy development, encourage business investors to invest in rural energy, make energy intensive, concentrate energy utilization, promote the development of the energy industry, provide employment opportunities for more rural young people, and solve the problem of empty nesters. Problems such as getting rid of poverty and getting rich in rural areas.

The government should issue relevant policies on rural energy, promote the legalization of rural energy use, and standardize the construction of all kinds of energy sources.

We will promote the development of new energy sources in rural areas. It is necessary to closely integrate the distribution of energy resources in local rural areas and the new demands and opportunities of the farmers for energy use, make overall planning, rationally distribute them, highlight the key points, and coordinate and promote the development of rural energy resources. It is necessary to vigorously promote the ecological recycling agriculture model linked by biogas, vigorously support the specialized development of rural biogas, and further increase the promotion of clean and environmentally friendly energy products such as solar cookers, solar water heaters, solar street lamps, etc. We should actively develop new energy sources such as wind energy, geothermal energy and micro-water energy which are used in rural production and life so as to promote the development of new rural energy and improve the quality of rural life.

6 CONCLUSIONS

To sum up, the current situation of rural energy development is not optimistic, farmers' awareness of environmental protection is not strong, and problems such as rural energy utilization still exist. We need to develop the rural energy industry, develop new energy sources, and reduce the damage to the environment. Promoting the rational development of Rural Energy.

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