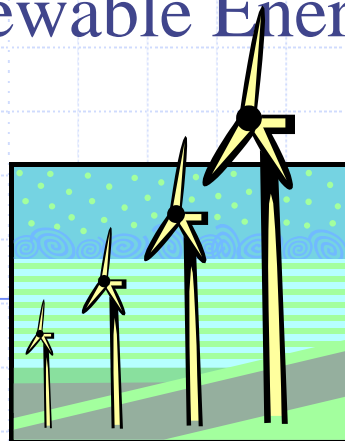


Fight to Achieve the Goal of Township Electrification Program

Prof. Ma Shenghong

Beijing Jikedian Renewable Energy development Center

March. 2003



中华人民共和国地图

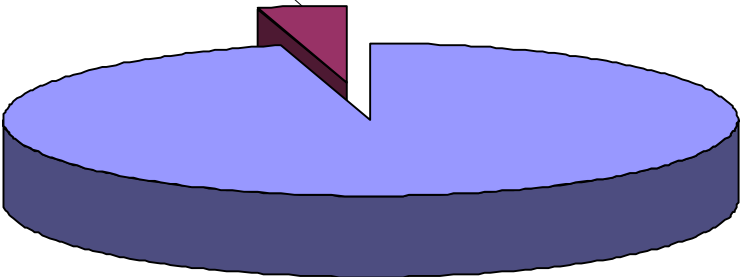


Rural Electrification Situation of China (end of 2000)

| Total Number of Villages | | Total Rural Households | |
|--------------------------|---------------|------------------------|---------------|
| 565,269 | | 198,933,600 | |
| Connected | Not connected | Connected | Not connected |
| 543,709 | 21,560 | 176,848,710 | 7,053,790 |

notconnected vilages

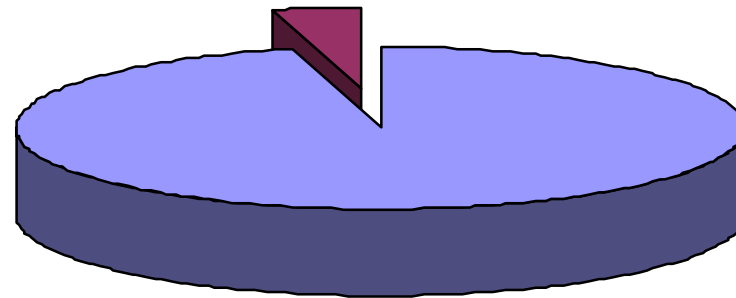
3.81%



connected vilages

96.19%

not connected
rural families
3.55%



connected rural
families
96.45%

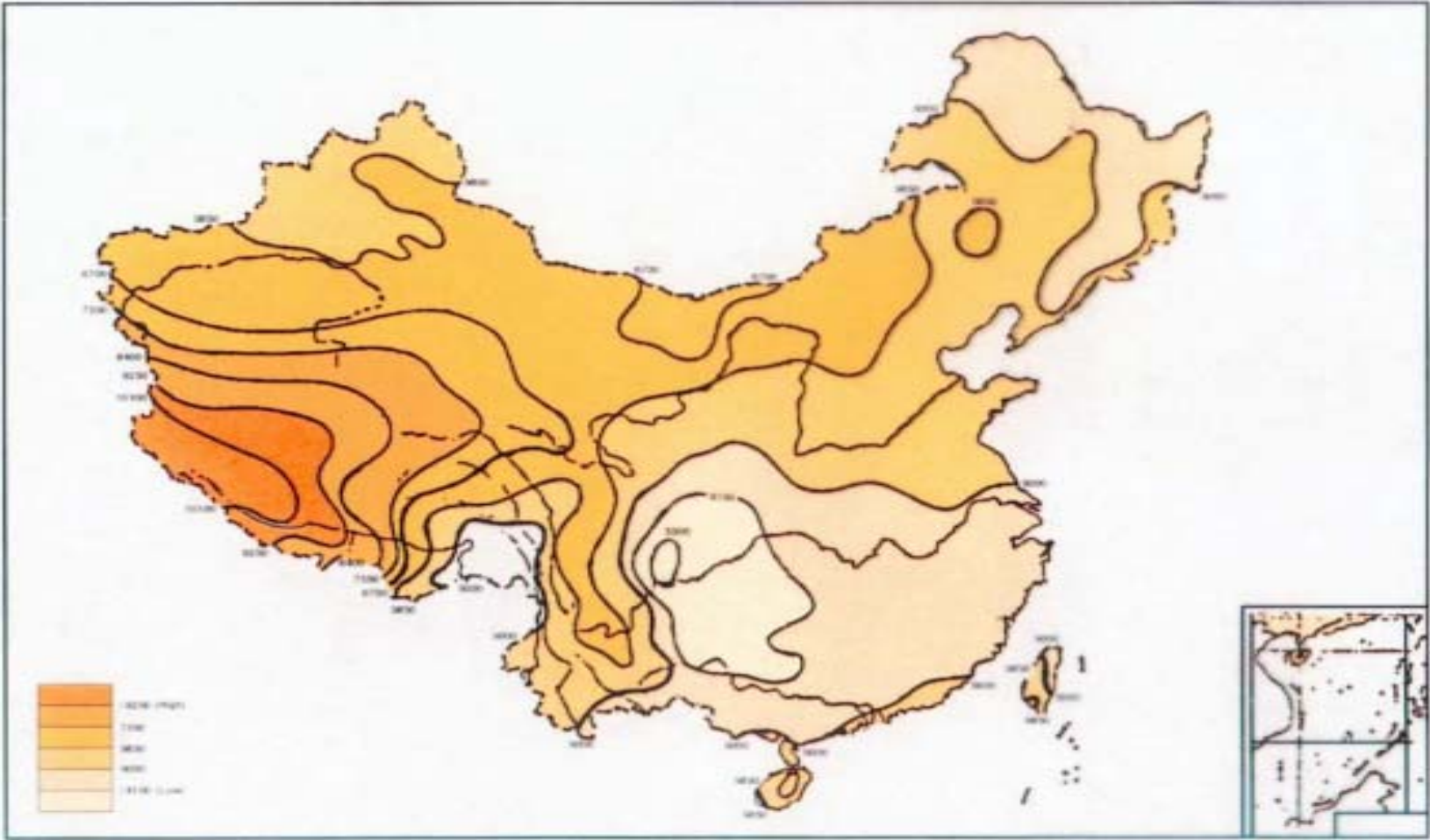
The First 10 Provinces with Unelectrified Households (list according to rate of the households •

| No | Province | Total rural households | Unelectrified households | % | Total No. of village | Unelectrified Villages | % |
|----|----------------|------------------------|--------------------------|-------|----------------------|------------------------|-------|
| 1 | Tibet | 367,000 | 289,300 | 78.83 | 7,306 | 5,254 | 71.91 |
| 2 | GuiZhou | 7,087,000 | 1,294,000 | 18.26 | 25,847 | 3,377 | 13.07 |
| 3 | Xinjiang | 1,872,600 | 316,200 | 16.89 | 8,934 | 563 | 6.30 |
| 4 | Hainan | 999,000 | 160,300 | 16.05 | 2,633 | 253 | 9.61 |
| 5 | Qinghai | 671,000 | 101,000 | 15.05 | 4,054 | 774 | 19.09 |
| 6 | Yunnan | 8,064,000 | 1,003,800 | 12.45 | 13,423 | 528 | 3.93 |
| 7 | Gansu | 4,403,000 | 488,700 | 11.10 | 17,803 | 1,045 | 5.87 |
| 8 | Ningxia | 810,000 | 64,000 | 7.90 | 15,616 | 1,306 | 8.36 |
| 9 | Inner Mongolia | 3,477,000 | 249,590 | 7.18 | 13,993 | 2,360 | 16.87 |
| 10 | Guangxi | 8,779,000 | 388,600 | 4.43 | 14,816 | 700 | 4.72 |

China Brightness Program

- ◆ It is planned that 23 million people in remote area shall be electrified by wind and PV technologies till 2010; 100 W power capacity per capita shall be installed, which will be 1/3 of average power consumption of the people at that time. Meanwhile the frontier stations, relay stations, road service stations, maintenance stations of oil pipe line, signal stations of railway in the remote areas shall also be supplied.**

Solar Energy in China



(注: 1MJ/m² ≈ 2.78 × 10³ kcal/m²)

图1. 中国年太阳能分布图(单位: 兆焦/米²·年)
Figure1. Distribution of solar energy in China(MJ/m²)

Wind Energy in China

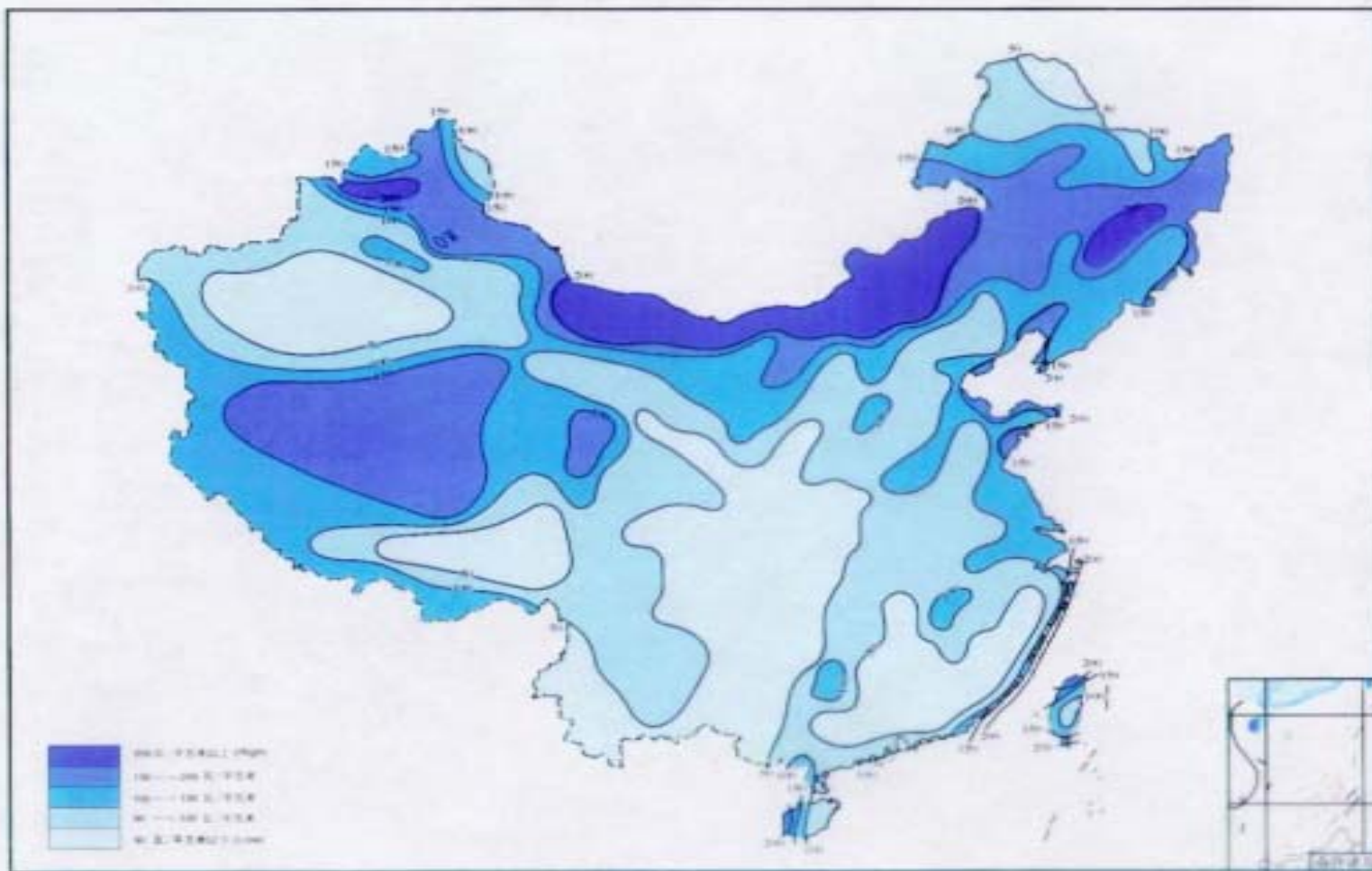
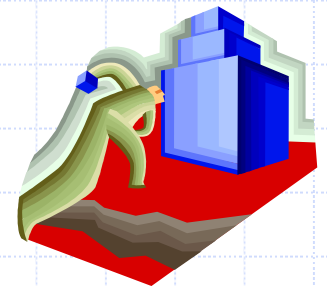


图3 中国有效风能密度分布 (w/m^2)

Figure3. Distribution of effective wind power density in China(w/m^2)

Song Dian Dao Xiang” **(Township Electrification Program)**

- ◆ **The Objective of the “Township Electrification Program” : to reliably and continuously supply power to those township locations where is not feasible to be connected by extension of grid in the Western provinces by adaptable RE technologies in the light of the realities of specific regions (PV, wind, small hydro or hybrids) in a sustainable way till 2003**



Definition the Objective

◆ Western provinces • Tibet, Xinjiang , Qinhhai, Gansu, Inner Mongolia, Sichuan, Chongqing, Shaanxi, Yunnan and Hunan

in the light of the realities of specific regions : to use the most reliable RE technology which adapts to the local realities in principal of least cost of power supply based on satisfying basic electricity demand (lighting, TV, public facilities)

Definition the Objective

◆ **sustainable way:** The installed PV systems work at least 15 years. Specialized power supply companies run the systems in commercial way. It is sound for environment. Users pay reasonable tariff. Local social and economical development conditions are improved, and the development is obviously faster than period without power supply, unity of nationalities is strengthened, society become more stable.

Definition the Objective

reliably and continuously supply: Quality of the power supply reached the specified standard, the supply reliability reached 97% to public facilities, at least 93% to normal users. Basic living requirements (light, radio, TV) are satisfied. Reserved system capacity shall be 30% of the present contracted load.

Results shall be achieved for the objective

Results 1: 933 installed off-grid RE systems supply power to the township in normal operation after test and acceptance procedure



Plan of Installation in Project Provinces

| Province | No. of installation in 2002 | No. of installation in 2003 |
|----------------|-----------------------------|-----------------------------|
| Tibet | 350 . | |
| Qinghai | 86 . | . . |
| Xinjiang | 48 . | 61 . |
| Sinchuan | 153 . | 120 . |
| Inner Mongolia | 39 . | . . |
| Gansu | 8 . | 20 . |
| Shaanxi | 16 | 2 . |
| Hunan | . . | 19 . |
| Chongqing | | 9 . |
| Yunnan | . . | 2 . |
| Total | 700 . | 233 . |

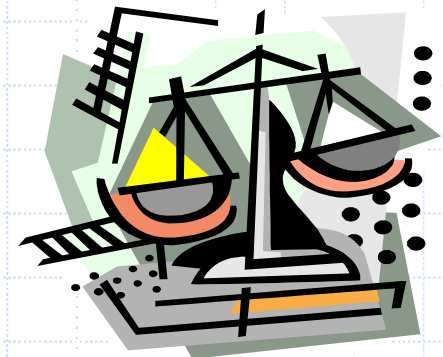
Results shall be achieved for the objective

Result 2: A power supply / service company is set up in each province and works following regulations. All working staff at the station are trained and qualified . Key technicians for trouble shooting service are positioned to keep the system in normal operation.



Results shall be achieved for the objective

Result 3: Tariff policy for off-grid power supply issued in each of the project provinces under a leadership of SDPC, it shall be bearable by the remote villagers and cover the supply costs of the service company who shall gain reasonable profit from the business.



Results shall be achieved for the objective

**Result 4 : Power supply contract shall be signed
between the service company and users.
Responsibility, right and obligation shall be
cleared and protected.**



Results shall be achieved for the objective

Result 5: Related Policies, regulations and standards are installed to launch follow-up program smoothly

Results 6: Condition for social and economical development is improved and living standard is raised in the remote townships.

People are expecting RE stations



It is really good to have a electrical light !



从电视上我们看见了过去从来没有见到的东西

我们觉得冬天不象以前那么漫长难熬了，有玩的了

自从有了电，来我们这的人多了，因为晚上亮堂了
我们觉得我们和外面的世界就在一起了，不那么孤独了

有了电真是太好了

新技术成功与否的标志：



The power offers us a better opportunities to develop local economy and improve living conditions



Thanks !