安源易如国际科技发展(北京)有限公司

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STATUS OF CHINA'S RENEWABLE ENERGY DEVELOPMENT AND UTILIZATION PROMOTION LAW - SUMMER 2004

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Executive Summary and Azure Views

China's early efforts to promote renewable energy (RE) through government policy, starting over 20 years ago, have had minimal effect in establishing commercial markets for RE technologies. The Chinese government is currently drafting a new policy, called the *Renewable Energy Development and Utilization Promotion Law* with input from leading international RE policy experts. This law was commissioned as a result of domestic and international interest to help China develop in a more sustainable manner. The law is expected to be based on internationally proven RE market development mechanisms. Azure expects key results from this policy to be:

- Implementation of the new RE policy will occur sometime between mid 2005 and early 2006. It will specify RE technologies that will receive preferential support (particularly wind, PV, bioenergy, and small hydro), market building mechanisms (such as mandatory market share and feed-in tariffs), and measures for enforcement of these mechanisms.
- Accelerated growth of grid connected wind power capacity (up to 500MW per year by 2008 and over 1000MW per year by 2012). This will support localized manufacturing for 2 – 3 world class wind turbine companies.
- China will become a global leader in solar PV production due to increased local market demand and tremendous export opportunities. This leadership role will be accomplished via technology transfer and manufacturing localization by international PV companies into China.
- Bio-fuels will begin to supplement petroleum based fuels for transportation; while biomass and biowastes may become important contributors to electric power generation through bio-gas production and co-firing with coal.
- Small hydro (up to 50MW per project) will expand by up to an additional 40GW by 2020. This will be primarily in the form of municipal projects in remote areas which may not be attractive for commercial investment.
- China will achieve 10% of electric power generation from renewable energy between 2010 and 2012.

Scope of Report

This paper presents a review of China's new renewable energy law that is currently under development. It provides:

- a background of Chinese RE policy history;
- a glimpse of the current regulatory system and RE law development process; and
- a forward view of what the new national Chinese RE law as it is expected to achieve.

Readers should understand that this paper focuses *only on the new national RE law*. Multinational instruments such as the Kyoto Policy and associated CDM or carbon credit trading mechanisms which might also effect renewable energy development in China are not a part of this law, and thus are not covered in this report. Also, at this stage of the RE law's development, a comprehensive set of definite targets for incentives, tariffs and market share goals has not been set.

The impetus of this report stems from the inherent challenges of understanding policy development in China, due to lack of transparency in the development and implementation process. The purpose is to help the international community better understand the significance of this new renewable energy policy, and how it may effect RE technology adoption and commercial market development in China. By more clearly understanding the motivations and expected results of this policy, the international community will be better prepared to participate in China's renewable energy markets.

For additional analysis and information on this RE law, CDM, and specific new energy markets and technologies in China, please contact Jason Trollope at: Jason.Trollope@azure-international.com.

Introduction

China's central government is currently in the process of formulating a national Renewable Energy Promotion Law (*REPL*) which is likely to have significant impact on the development of the Renewable Energy *(RE)* industry in China. Building on twenty years of individual regulations and incentives, this new law is expected to provide various stakeholders with a unified strategy to increase the proportion of RE in China's overall energy mix. Given the central government's most recent pledge made on 3 June 2004 at the International Conference for Renewable Energies in Bonn, Germany, this law could result in 10% of all electricity being produced from RE sources by 2010.

Implementation of a supportive policy framework is a much anticipated necessity for local and international commercial players that are active in China's fledgling RE sector. The current revision of the draft law is a marked departure from past attempts at legislation and policy support, which provided less clear direction and lacked substantial incentives, to encourage RE development. The result of the new law for today's market participants should be a more attractive investment and operating environment. Significant business opportunities will be the reward for project developers and equipment manufacturers across a broad spectrum of wind, solar PV, small hydro and bio-energy markets. However, this positive result will only be realized if the policy is strongly and consistently enforced. Lack of enforcement has minimized the effectiveness of previous laws and policies.

This report summarizes China's current RE policy regime, and provides a description of the key provisions of REPL as of June 2004. Information about REPL was obtained from presentations and statements of individuals closely involved in the drafting process. Therefore, Azure believes the content of this report to be accurate and pertinent. However, it *must* be noted that the draft law will continue to change as REPL evolves. Thus, statements in this paper represent the *current* forward looking views of Azure International and experts directly involved with the formulation of policy measures; views which may change as REPL is refined and implemented.

Summary of Current Policy Regime

China's current policy regime for the development and promotion of RE is a collection of individual regulations, statements and incentives implemented over the previous twenty years (see Table 1). Many of these measures are technology or project specific, and do not collectively form a unified policy framework on which a RE industry can scale up. It is useful to understand the history of how this has developed, as it provides important perspective for China's recent efforts in creating a policy that will significantly improve RE market development within the country.

This historical summary is largely based on information gathered from a series *fact sheets* jointly created by the United States National Renewable Energy Laboratory (*NREL*) and China's Renewable Energy Industrial Association (CREIA). For a more comprehensive summary of China's present policies, please refer to NREL's *fact sheets* at www.nrel.gov/china.

Policy Structure

Renewable energy policy exists at three levels of government in China: i) central, ii) provincial and iii) local (municipal and county). Senior leaders at the central level outline general policy directives by delivering speeches on national concerns such as environmental protection, sustainable development and energy diversity. It is also at the central level that relevant ministries and agencies, including the National Development and Reform Commission (NDRC), form national strategies and plans for RE development in China. Detailed incentives and managerial guidelines supporting the implementation of these national plans are created at all three levels of government.

With respect to the effective implementation of national policies in China, political and economic localism has regularly posed a significant challenge. While the central government is addressing the need for an increased level of enforcement, the division between national and local interests may continue to complicate efforts to expand the utilization of RE throughout China.

National Financial Incentives

The primary types of financial incentives presently employed to support RE in China are subsidies and tax & custom duty reductions.

Subsidies are popular internationally as a means to support the development of RE. In China, subsidies are used to fund the operations of relevant government agencies, research and development of RE technologies, and demonstration projects. As in other countries, subsidies for RE in China are designed to support domestic stakeholders.

With respect to tax incentives, the central government only offers reductions to small hydro (6% Value Added Tax (VAT)), biogas and wind-based renewable energy production. In 2001, the Ministry of Finance and State Tax Administration jointly implemented the *Adjustment of Value-Added Tax for Some Resource Comprehensive Utilization Products*. This law cut the VAT rate of wind power to 8.5% from the standard rate of 17%, and refunds the VAT on power generated from municipal solid waste back to the original generators.

As the only national policy supportive of RE development, the VAT adjustment has not provided enough assistance to RE technology enterprises to stimulate broad adoption. However, most renewable

Table 1: Sample of RE Policy Documents[1]

1983	Suggestion to Reinforce the Development of Rural Energy
1994	Ride the Wind Program and Brightness Program, formulated by the State Planning Commission (SPC)
1995	Outline on New and Renewable Energy Development in China, SPC, State Science and Technology Commission (SSTC), State Economic and Trade Commission (SETC)
1995	New and Renewable Energy Projects in Priority (1996-2010) China, by SSTC, State Power Corporation, and SETC
1996	State Energy Technology Policy
1996	Ninth Five-Year Plan and 2010 Plan of Energy Conservation and New Energy Development by the State Power Corporation
1996	Ninth Five-Year Plan of Industrialization of New and Renewable Energy Technology by SETC
1997	Energy Saving Law
1997	Circular of the Communication and Energy Department of SPC on Issuing the Provisional Regulations on the Management of New Energy Capital Construction Projects
1999	Circular of Ministry of Science and Technology and NDRC on Further Supporting the Development of Renewable Energy
2001	Adjustment of Value-Added Tax for Some Resource Comprehensive Utilization Products by the Ministry of Finance (MOF) and State Tax Administration
2001	Electricity Facility Construction in Non-Electrified Townships in Western Provinces of China or Township Electrification Program by SDPC and MOF
2003	Renewable Energy Promotion Law

[1] www.nrel.gov/china, "Renewable Energy Policy in China: Overview," U.S. National Renewable Energy Laboratory *fact sheets*, April 2004.

energy enterprises can also obtain an income tax holiday, and bio-energy development projects can generally receive approval for income tax reduction or exemption.

Regarding customs duties, wind turbines and their main components and photovoltaic modules enjoy customs duty rates below the 23% standard duty. Exemption from customs duty depends on whether or not a technology is deemed by the government to be high-tech.

It is important to note that although the central government does not yet use a general pricing mechanism for RE-based electricity, Guangdong province has recently instituted a 0.528RMB per kWh (US$0.064) tariff for all wind generated electricity. While Guangdong's initiative does not constitute a national pricing mechanism, it may mark the beginning of a national trend.

Grid connected wind farm in Inner Mongolia. *Photo - 2002*

The Renewable Energy Development and Utilization Promotion Law

Drafting Process and Timing

Signifying the importance China's political leaders are now placing on incorporating renewable energy into China's development strategy, the Environment and Resources Protection Committee (ERPC) of the National People's Congress (NPC) commissioned the formulation of REPL. In August of 2003, Tsinghua University and the NDRC were both tasked with drafting a separate version of REPL, which will be periodically reviewed and finally combined by the ERPC.

The purpose in commissioning two versions is to provide the ERPC with a broad variety of information and legal recommendations, collected from a diverse body of stakeholders. For example, through the NDRC drafting process the ERPC is receiving a somewhat politicized version of REPL which entails compromises between powerful traditional energy interests, competing government agencies, and sustainable development interests. The Tsinghua drafting process, on the other hand, is producing a relatively academic version which includes specific targets and figures. Similar targets were not found in the NDRC draft until mid-summer of 2004.

Both versions incorporate a significant amount of "best practices" from countries that possess comparatively developed renewable energy sectors. Input and guidance on international experiences is being furnished by international organizations including the United Nations Development Program, World Bank, USDOE, United States Environmental Protection Agency, Energy Foundation, and Deutsche Gesellschaft für Technische Zusammenarbeit (*GTZ*), which are all parties to the respective drafting groups.

An initial NDRC draft was submitted to the ERPC in January, 2004. A second version was completed at the end of April, and reviewed by the NDRC drafting group during the weekend of 15-16 May. Both the NDRC and Tsinghua University drafts were resubmitted to the ERPC at the end of June. The ERPC will form a combined version, entailing the "best" of each, by the end of 2004. If the drafting and review process is completed according to the government's timetable, REPL could be adopted and made effective by the end of 2005. However, some individuals contributing to the drafting process suggest that the law might not actually be put into force until sometime in 2006.

Purpose and Scope of the Promotion Law

According to both versions, the purpose of REPL is to promote the development and utilization of renewable energy in China by supporting the rise of a renewable energy industry. It is also expected to contribute to the improvement of the national energy system, protection of the natural environment, electrification of China's rural and remote areas, and acceleration of China's sustainable economic and social development.

The Tsinghua draft put forth initial specific targets for the development of RE in China. It states that by 2010, the amount of RE utilized in China will be at least two times as much as that in 2000, and that installed RE-based power capacity will be no less than 60GW. It goes on to say that by 2020, the utilization of RE in China will increase by a factor of two from 2010, and installed RE-based power capacity will be no less than 120GW.

According to both versions, "renewable energy" refers to small-scale hydro, wind, solar, biomass, geothermal, ocean, and other resources in nature that can be continuously utilized for energy generation, directly or after processing and conversion. Although the scope of REPL appears inclusive of all possible RE, the central government will concentrate its support on small-scale hydropower, wind power, solar energy, and biomass energy. These are RE resources that the central government has already identified as possessing the most potential in China to compete with fossil fuel-based energy sources while requiring the least amount of government assistance.

Three 10kW wind turbines supplying power to an off grid village in Inner Mongolia. *Photo - 2004*

Renewable Energy Development Plan

As is the case with many laws in China, REPL will include articles or clauses that merely summarize important regulations or plans, the "details" of which are to be drafted by specific organizations at a later date. For example, both versions provide a general description of a national renewable energy development plan that is to be created by the State Council. The State Council is to create this plan according to the central government's broader energy plan, and incorporate it into the national economic and social development plan, which is most likely a reference to the upcoming 11th Five-Year Plan, 2006-2010. The plan itself should include the targets, structure and scale, layout and focus, industrialization strategies, investment and economic benefits, and policies and guarantee measures for developing and utilizing renewable energy. The status of this development plan and its proposed completion date are presently unclear.

Resource & Project Development

An important element of both versions is the clear designation of responsibility for assessing and managing RE resources. To date, China lacks both an oversight body and the technology to assess and manage RE resources at international standards.

The government organization tasked with organizing surveys and managing renewable energy resources is the energy management agency of the State Council, which is most likely the Energy Bureau (EB) under the NDRC. Responsibility for renewable energy resources will flow from the EB through other relevant agencies in the State Council to the local government at the above-county level, who will organize surveys within its administrative area. Survey results will be reported to both an EB office at a higher level and the general public.

Regarding management of RE resources, the EB will oversee implementation of renewable energy projects by dividing them into different grades and categories. The EB will also be responsible for granting rights to enterprises to develop and operate prioritized projects for the production of renewable energy electricity and biological liquid fuels (e.g. wind concession projects of 100MW, two of which were awarded in 2003). EB offices at the above-county level would be responsible for granting rights to non-prioritized projects for power generation and biological liquid fuels production through a process of tendering, auction, or negotiation, based on transparent and equitable principles.

On-Grid, Off-Grid and Rural Applications

Given the current Chinese leadership focus on rural development, there is an interest in having REPL provide support for off-grid RE applications. Both versions clearly stipulate that the development of RE should improve the lives of Chinese people living in rural and remote areas. However, according to some international consultants advising on the drafting, the final version will likely address only the development of grid connected renewable energy applications. Although the NDRC has expressed a desire to include both on-grid and off-grid applications under REPL, adequately covering both large scale on-grid and small scale off-grid technologies and projects under one law would be excessively complex and costly. Said international consultants believe the NDRC will eventually adopt this viewpoint.

Encouraged RE Technologies

As was mentioned previously, one important feature of REPL is that it will clearly prioritize technology areas that are to be supported, and identify specific support mechanisms. The technologies and applications in *Table 2* are those which are expected to be supported.

Similar to renewable energy markets in other countries, China's central government views grid-connected wind turbines as the renewable energy-based power technology with the most commercial potential to compete with coal-based power technologies. Therefore, while alternative renewable energy technologies will receive developmental support under REPL, wind power will feature prominently with respect to priority and incentives.

RE Standards, Testing and Certification

Nationally approved standards, testing and certification requirements are critical areas where China lacks suitable structure for supporting RE markets. Without the ability to test and certify RE technologies to nationally and internationally approved standards, it is not possible for stable markets to develop. These factors are necessary to provide measurable and trusted quality and performance standards for products, projects and training. There has been considerable cooperation with international experts and organizations to establish preliminary standards for China's RE market, most of which are modeled after best practice standards that are already in place in Europe and North America.

Addressing the importance of standards, both versions call for the standardization administrative agency of the State Council, which is most likely the Standardization Administration, to set and manage national standards for technologies and products related to renewable energy. Other agencies of the State Council will also be expected to set RE industry standards where they are needed, and report such cases to the Standardization Administration. Moreover, non-RE industry standards set by agencies of the State Council should be favorable to the development and utilization of RE.

With respect to certification, both REPL versions stipulate that national centers for the testing, examination and certification of RE technology and

Table 2: Encouraged RE Technologies

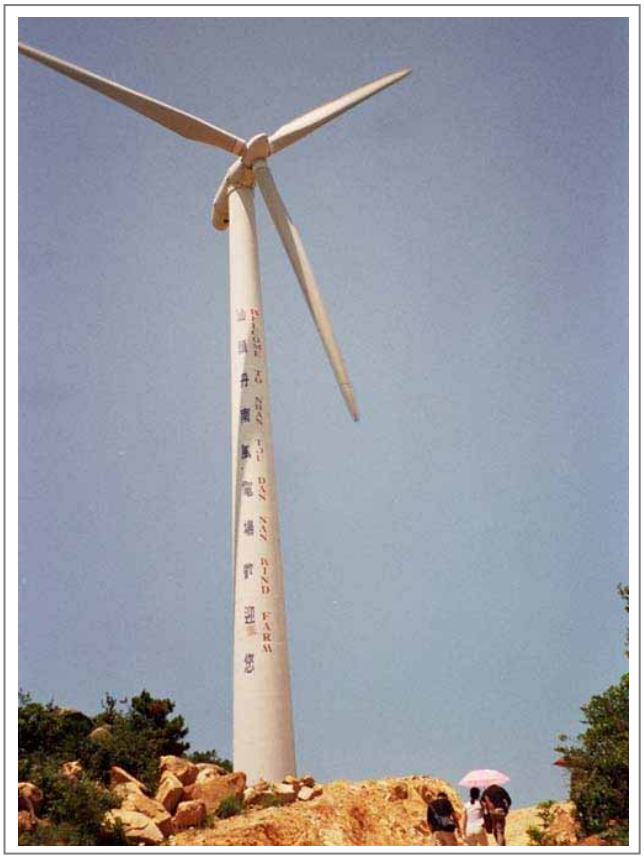
Application	Technology
On-grid power	- Small hydropower - Wind turbines - Biomass power - PV (pilot projects) - Ocean (pilot projects) - Urban land fill gas recovery and power generation - Urban incinerator power generation - PV systems on urban & rural buildings and roads - Geothermal (pilot projects)
Off-grid power	-Independent renewable power systems
Rural	- Methane gas recovery and utilization technology for centralized animal farms - Agricultural waste to energy (electricity, gas, heat) technologies
Biomass Fuels	- Biomass fuel gas and heat technologies - Technologies for biological liquid fuels derived from non-food crops, non-cooking oil crops and other non-cooking oil sources
Solar Thermal	- Solar water heaters for buildings - In areas where annual sunlight exceeds 1500 hours or 500KJ per square centimeter, solar hot water systems must be installed or pipelines and installation locations must be prepared in new residences, hotels, restaurants, hospitals, schools and public buildings

components will be established through the cooperative efforts of the EB, Ministry of Science and Technology and the Certification and Accreditation Administration (or other related groups). Preliminary efforts to establish certification standards are already underway.

Market Mechanisms

Under the NDRC version, REPL will employ three primary market mechanisms to scale-up China's renewable energy sector. These are expected to be as follows:

Mandatory Market Share (MMS) system: Targets for the total volume of renewable energy to be produced will be set in proportion to the overall production or consumption of energy in China. According to the central government's most recent pledge made on 3 June 2004 at the International Conference for Renewable Energies in Bonn, Germany, China will possess 60GW (10% total installed electric power capacity) of renewable power capacity by 2010. This figure increases to 120GW for 2020 (about 12% of total installed power capacity). A comparison of current levels of installed RE power generation capacity with future goals is presented in *Table 3*.



A 600kW NEG Micon turbine which is part of a 24MW wind farm on Nan'Ao Island in the south east Chinese province of Guangdong. *Photo - 2003*

Table 3: RE Power Capacity: 2004 - 2020

Technology	2003[2]	2010[3]	2020[4]
Small-Hydro	30GW	50GW	74GW
Wind	.56GW	4GW	20GW[5]
Bio-Energy	2GW	6GW	25GW[6]
Solar PV	0.04GW[7]	0.45GW	1.5 – 2GW
Total	**32.6GW**	**60.45GW**	**120.5GW**

Green Electricity Market program: This program will encourage enterprises and individuals to buy renewable electricity voluntarily. Provincial governments are expected to design application methods of the Green Market program. This is generally a very new concept in China, although there have been some preliminary steps toward green electricity programs in Shanghai.

Earlier this spring, the Shanghai Energy Conservation Supervision Center and Shanghai Municipal Electric Power Company began introducing a green electricity scheme that encourages businesses to purchase electricity produced from nearby wind and solar power facilities. In exchange for voluntarily purchasing slightly higher priced "green" electricity, the city will award companies "honor certificates" and list their names in major local media outlets. While the amount of RE-based electricity being produced for the scheme is only a small fraction of the total electricity consumed in Shanghai, the scheme is a working model for both green electricity pricing and public awareness of RE in China[8].

Differential pricing system (feed-in tariff system): According to the NDRC version, the pricing management agency will determine the differential

[2] Zhang, Guobao, Keynote Address during the International Conference for Renewable Energies, Bonn, Germany, 3 June 2004.
[3] www.terradaily.com, "China the Star Pledges for Renewable Energy," 4 June 2004.
[4] NDRC targets
[5] www.chinadaily.com.cn, "Electricity Scheme Lights Up the Lives of Rural Residents," 12 May 2004.
[6] Wang Zhongying, "Present Status and Future Prospects for Development of Renewable Energy in China," Center for Renewable Energy Development, National Development and Reform Commission, Slide 25, April 2004.
[7] 2002 Figure, Zhu Junsheng, Chinese Renewable Energy Industries Association. Personal Interviews, "*Market Statistics and Development Trends of Renewable Energy*". 28 August 2003.
[8] www.chinadaily.com.cn, "Shanghai Targets 'Green' Power Plan," 23 March 2004.

prices of grid-connected renewable power based on the costs of advanced power generation projects of the same class. However, it is not yet clear whether the pricing management agency referred to is actually the NDRC or State Electric Regulatory Commission (SERC).

Preliminary pricing formulas have already been created in cooperation with international organizations such as the World Bank. But, as these mechanisms are a contentious issue, they will be gradually incorporated into the NDRC version. Also, this differential pricing system will not be applicable to government concession projects as the grid connection price for concession projects is determined through a bidding process.

However, sources have suggested that feed-in tariffs for wind projects will likely be first set at a rate based on the winning bids of the initial 2-5 wind concession projects tendered during of 2003 and 2004. These prices will be announced publicly by the government on a regular basis.

More detailed pricing parameters are found in the Tsinghua version, including a seven year feed-in tariff period for each type of RE power generation technology (i.e. wind turbines). The "protective prices" will be set by the State Council's energy management department for each technology on a biannual basis. Upon completion of a period of fixed prices, it is proposed that grid companies shall purchase electricity from RE power generators at a price no less than the average retail price. Again, this differential pricing system will not be applicable to government concession projects.

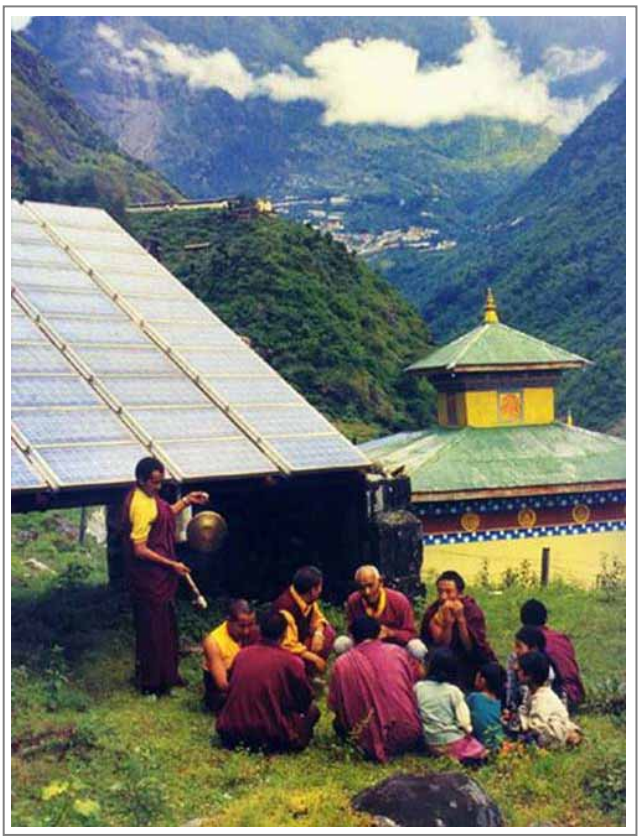
Economic Incentives

Both REPL drafts indicate that the central government will provide unspecified levels of economic incentives. How these new incentives would exceed current incentives is still unclear, as is the access that international parties would have to government soft loans, grants and other financial incentives. In general, it is expected that government subsidies will be provided for activities including:

- Construction of renewable energy projects in rural areas;
- Construction of stand-alone renewable power systems or other projects in remote areas;
- Assessment of resources, establishment of systems for the management of technologies and products, and the promotion of technologies;
- Technology research, development, introduction and demonstration, and pilot projects;
- Support for local manufacturing of renewable energy technology; and
- Popularization, education, training, and international cooperation and exchange.

According to the Tsinghua version, the subsidizing of RE development will be financed by creating a "special financial fund". This fund may be based on money from an emissions tax already charged to power generators for air pollution emissions, a proposed fossil-fuel consumption tax, or another similar source. Both versions stress the importance of widely distributing the cost of RE development to the whole of Chinese society. Such a fund would not be a new precedent in China as the central government has regularly used special funds to finance large national initiatives.

Loan Measures: Policy banks (Export-Import Bank of China, China Development Bank) will provide soft loans, and government-owned commercial banks (Bank of China, China Construction Bank, Agricultural Bank of China) will provide bank credit to support the development and utilization of renewable energy.



Solar PV array used for off grid power in Tibet. *Photo - 2003*

14kW solar PV array and 20kW of small wind turbines are part of a wind/solar/diesel hybrid off grid power supply for a village 200km northeast of Hohhot, Inner Mongolia. *Photo - 2004*

Tax Measures: The government will offer tax benefits for renewable energy development and utilization projects listed in the national industry directory, which will be set by the State Taxation Administration. The government will also reduce or eliminate value-added tax on the manufacturing and sale of equipment used in the development and utilization of renewable energy, and products derived from renewable energy resources, including electricity, heat, fuel gas and liquid fuels. Tax benefits will also be provided with respect to real estate duties for marketable residences installed with solar hot water systems or solar power systems.

Obligatory Parties Supporting RE

While the NDRC version generally stipulates that any enterprise or individual in China will have the obligation to utilize renewable energy, a small number of stakeholders will likely bear the majority of responsibility to promote renewable energy. For example, both versions stipulate that electric grid companies will not only be responsible for purchasing all electricity generated from qualified renewable power facilities connected to the grid, they will also be required to offer convenient grid connection for renewable power generation projects. They may also be expected to operate and manage independent renewable power systems invested in and established by the government.

It has been proposed that the cost of purchasing higher-priced renewable power will be shared by distributing higher costs nationally over all grid companies, thereby mitigating the negative financial impact potentially born by only a few grid companies. Such obligations will not be placed on national power generators or other energy companies. However, this situation is controversial and not finalized. Similar to grid enterprises, companies selling petroleum will be obligated to purchase biological liquid fuels which meet the quality standard at a price set by the government.

Electric grid companies, petroleum companies, and real estate development and construction companies that fail to comply with REPL will face penalties up to RMB10,000,000 in the NDRC version. While avoiding the mention of specific penalties, the Tsinghua version also addresses government negligence and corruption by highlighting a host of actions that would warrant punishment.

Conclusion

While REPL is still in the drafting stages and lacks concrete directive in many areas, it is already clear that the central government is attempting to formulate a comprehensive policy framework to support the rapid expansion of China's renewable energy sector. Furthermore, discussions with various Chinese companies and non-governmental organizations have clearly shown that the commercial sector is expecting significant market growth incentive from this policy.

When combined, the NDRC and Tsinghua University versions should form a REPL that prioritizes RE development as a national interest, and provides market mechanisms and economic incentives presently utilized in established international RE markets. Given all of the domestic and international expertise that has been amassed to formulate a national RE strategy for China, REPL has the potential to be one of the world's most supportive national RE laws.

However, as the drafting proceeds, so does the political lobbying. While international advisors in the NDRC drafting team are confident of senior leadership endorsement, and various central-level government officials have officially pledged China's support for RE, the eventual implementation of a comprehensive and effective REPL shall serve as proof of the central government's long-term commitment to RE.

Note: Azure International will periodically furnish updates on progress of REPL development. The next update can be expected in early 2005. Please contact Jason Trollope at jason.trollope@azure-international for additional information. Comments, discussion and feedback on this report are welcome.

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