



US-DPRK Village Wind Power Project: Gallery

April 14, 1999



Professor Wan Yanija welcomes DPRK Delegation



Deng Keun addresses DPRK Delegation.

After a briefing and introductory remarks by Professor Wang Yanjia, EETC, Madame Deng Keyun of the Ministry of Agriculture briefed the delegation on April 14 on rural energy planning in China. In the afternoon, Zhang Lanying of the Chinese State Power Corporation briefed the DPRK delegation on rural grid rehabilitation and rural electrification, followed by a presentation on rural energy technology options and evaluation by Gu Shuhua, Tsinghua University, in the evening.

[Project Info](#)

April 15, 1999



Li Jingjing from the Energy Research Institute.

On April 15, Li Jinjing of the Energy Research Institute, and the State Development and Planning Commission briefed the Delegation.

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April 16, 1999

On April 16, the Delegation was briefed by Shi Dinlin, Beijing Rural Energy Office, on rural energy development, management, and economics in Beijing rural areas, and made site visits to Daxing, where the Delegation inspected solar energy utilization, biogas, energy efficient stoves, and large-scale ecological farm-works. The Delegation also visited Tongzhou where they inspected the “four-in-one” project (solar, greenhouse, biogas, and piggeries).



Mr. Shi Mianlin from Beijing Rural Energy Office introduces “4 – in – 1” project.



Biogas-heated greenhouse with vegetables and grapes.

[Project Info](#)

May 8-10, 1999



Professor Yin Zhiqian from Tsinghua Solar Company.



DPRK Delegation inspect solar heaters.

Currently, the company is developing a hybrid hot water heater using a combination of electricity and solar thermal, an intelligent “idiot-proof” water heater design. The inventor and patent-holder, Prof. Yin Zhiqian, explained the principals of the technology, answered many technical questions, and led the DPRK Delegation on a tour of the all-glass evacuated tube production line. The activities arranged for the days after the Study Group returned from the US primarily emphasized explanations, discussions, and site visits related to specific technologies, such as:

All-glass evacuated tube solar hot water heaters. The main product of the Tsinghua University Solar Company. The vacuum-coating (sputtering) technology employed, for which Tsinghua University holds the patent, is an advanced technology by international standards. The solar water heaters can be used at temperatures of -20° Celsius.

| Project Info |

April 27, 1999



Professor Wang with Engineer Kim discuss dam technology.

Rock-filled dams and dam construction technology. Tsinghua University Department of Hydrology professor Wang Qingyou is a hydro specialist with abundant practical experience. He was involved in the design and construction of many reservoirs, including Beijing's Miyun reservoir, and is currently an expert serving on the Technology Committee of the Three Gorges Project Development Corporation. He gave a detailed explanation of the design principles and construction process for many types of dams, such as rock-filled dams, concrete dams, and earthen dams. He answered numerous questions from the delegation regarding technical problems such as water seepage, construction techniques, and design criteria.

| Project Info |

May 8-10, 1999



Mr. Le Defu and Mr. Lu Fengbao with DPRK delegation.

Site visit to wind water-pumping installation. Wind water pumping technology is widely employed in some areas of China, such as Inner Mongolia and Jiangsu. It is principally used to provide water for cultivation of crops and fish, livestock raising, and domestic water use. The delegation visited a wind water-pumping installation located on a farm in Yixingbu, within Tianjin municipality, which is used to lower the water table. Because this farm is on the coast, the groundwater has a very high salinity.

Before the wind water-pumping technology was used, most of the soil at the farm was so saline that crops could not be grown there. Mr. Li Defu of the China Wind Machinery Association and Tianjin's Shuangjie Wind Machinery Factory manager Mr. Lu Fengbao led the tour and answered questions from the delegation.

The China Wind Machinery Association is the organization primarily concerned with non-electric use of wind energy in China, and has a staff of specialists to provide information, evaluation, and engineering design. The Shuangjie Wind Machinery Factory is a factory producing wind water-pumping equipment. This factory produced all the equipment at the site we visited. The factory also exports abroad to countries such as Sri Lanka.

Kaplan turbine. Tsinghua University Department of Hydroelectric Engineering Prof. Wu Yulin has been studying hydraulic equipment for many years. He gave the delegation an introduction to his most recent accomplishment: China's major computer-aided design and optimization software for Kaplan turbines. He also answered specific technical questions about things such as leaking oil seals. Mr. Wu provided the delegation with a large number of technical reference materials, collections of published papers, and research reports.

Small hydro technology. Mr. Li Ying is the former bureau chief of the Hydroelectric Bureau of the Ministry of Water Resources, and is an internationally-recognized expert on rural electrification. He not only knows every aspect of the small hydro development scene in China, he is also thoroughly familiar with the technical issues of small hydro design and construction. He presented the delegation with a large-format photo book of China's rural hydro development and related technical materials.

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May 8-10, 1999

Beijing Solar Energy Research Institute. This is the most famous solar energy research institution in China, with numerous R&D personnel and an extensive product line. Mr. Luo Yunjun, secretary of the Solar Thermal Utilization Committee of the China Rural Energy Professionals Association, and Mr. Li Zhongming, assistant to the director of the Beijing Solar Energy Research Institute, introduced the delegation to BSERI's work in scientific research and product development since its establishment in 1979.

They gave special emphasis to introducing the Institute's product line of flat-plate solar hot water heaters, heated-tube type evacuated tube solar hot water heaters, and high efficiency solar ovens. The delegation visited BSERI's sales department, the imported Canadian copper-aluminum alloy solar collector production line, and the high-efficiency photovoltaic experimental production line.

The Delegation also visited the Solar Products Exhibition Hall at the Xiakang Market, established by end Ministry of Construction. The Chinese government to further the utilization of solar energy in the construction industry established this market. It is worth pointing out that BSERI's high efficiency PV production line, which is still in the experimental stage, has production costs comparable to international levels, while the price of their solar hot water heaters is about one-fifth of the international market price, making them extremely competitive.

The Chinese specialists expressed the view to the DPRK that this solar collector technology is already fully mature, and that there is no need to waste time on further research. Importing foreign technology is the simplest and most expeditious method (of obtaining the technology).



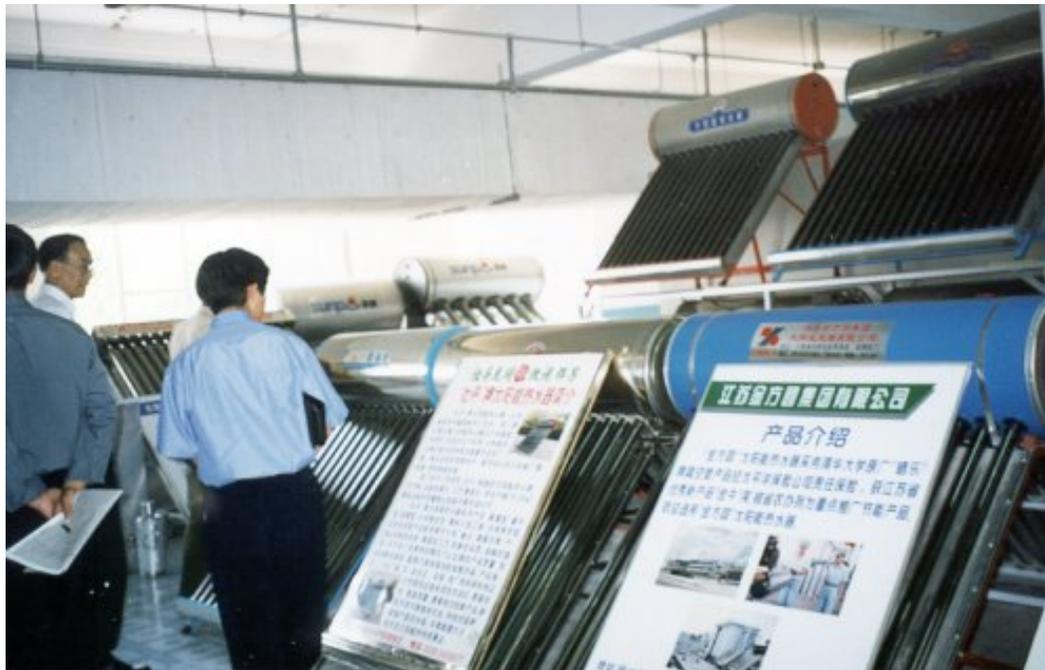
Li Zhongming (right), Luo Yunjian (middle)



High Efficiency Stove



Solar heater for urban residents



Xiao Kang Market, solar heater hall.

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