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Chinese Vice Minister Announces Goal Of Greater Foreign Investment

At a recent two-day meeting of the China-U.S. Investment and Trade Symposium held in New York, Vice Minister of Foreign Trade and Economic Cooperation (MOFTEC) Long Yongtu discussed China's efforts to ensure an environment conducive to foreign investments in the country. Speaking at a luncheon held by the United States Foreign Policy Association, Yongtu reaffirmed China's willingness to accede to the World Trade Organization (WTO).

The Vice Minister, addressing the audience in the capacity of China's Chief Representative for Trade Negotiations, outlined a number of efforts the country has undertaken to meet its target of 8% economic growth for the year. Allocations have increased for basic infrastructure construction and the country is seeking to keep its currency stable. In addition, efforts to establish a trade and investment legal system in keeping with international practices is underway.

China is taking steps to stimulate its domestic economy as evident by several interest rate cuts since the middle of 1996 and more likely if the U.S. opts to continue dropping its rates. Funds are also being raised for a package of infrastructure spending equivalent to US\$1 trillion. As a result, China's target of eight percent real GDP growth for 1998 still looks attainable.

China attracted more foreign investment in 1998, MOFTEC officials reported, despite declining investment from Asia, resulting from the Asian financial crisis. According to the organization's statistics, United States investment in China grew 46% to 4.48 billion U.S. dollars in approved contractual value during the first nine months of 1998.

In comparison, investment from the European Union increased to 4.7 billion dollars, a growth of 64%. This rise surpasses all of 1997, which came in at 4.23 billion dollars.

During the same period, total foreign investment in China is reported to have grown 2.45% to 35.8 billion dollars. In the previous two years, foreign investment in the country had declined. ☛

Yellow River Tapped To Meet China's Power Needs

The Yellow River, the second longest river in China, is playing a key role in the expansion of China's hydropower capacity.

An official of the Northwest Electrical Administration reports that seven medium and large hydropower stations have gone up along the upper reaches of the river. These stations have a generating capacity totaling 5.4 million kw. The recently constructed Liji Xia hydropower station has a capacity of two million kw, according to official figures. The Xinhua News Agency reports that this new station cost five billion yuan, or 604 million U.S. dollars, to complete. These stations will eventually be part of a corridor of 25 planned stations along the river.

The news agency reports that the power shortage in northwest China has stifled economic growth in the area. In order to tap the vast potential in the region's water resources, nine electric companies have come together to develop a timetable for the construction of 10 medium sized hydropower stations on the river, the agency claims. The consortium is headed by the China State Power Corporation.

Large stations in Gongboxia, generating 1.5 million kw, and Laxiwa, generating 3.72 million kw, are expected to be completed first.

The new stations have been constructed along the 918 km Longyangxia to Qingtongxia section of the river. According to the Xinhua News Agency, the Chinese government is committed to increasing investment in power generation in this section of the river, in order to maximize the favorable hydro-electric resources available there. The water level falls by 140 meters every 100 km, with a drop of 1,300 meters in this region.

According to Xinhua, the Northwest China Surveying and Designing Institute has revised its plans for hydropower station construction on the upper reaches of the Yellow River. When fully completed, the 25 stations will have a generating capacity of 16.58 million kw, with an annual electricity output of 58.9 billion kwh.

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Qaidam Area Reveals Rich Oil, Gas Finds

Rich deposits of oil and gas have been found in the oil-rich northern area of the Qaidam Basin, China's future onshore oil and gas production base in the northwest of the country, reported the *China Daily* mid October.

One of the basin's operating oilfields has been verified as having 31 gas layers 69.9 metres thick, and another well proved to have 13 oil layers 43.4 metres thick.

The Qinghai Oil Field is the fourth-largest natural gas field in China. The northern part of the Qaidam Basin has the brightest exploration prospects in the Qinghai Oil Field, with oil reserves expected to reach 1.7 billion tons and natural gas reserves, 300 billion cubic metres.

Last year, new natural gas reserves of 75 billion cubic metres were found in the Da'erxun Lake area in the northern part of the basin. A 1,727-metre-thick oil layer was also discovered in the Lenghu Lake area, also in the northern region.

International Symposium On Heavy Crude Hosted By China

Over 500 participants from 24 countries attended the Seventh International Conference on Heavy Crude and Tar Sands which was held in Beijing this past October. The four day meeting's theme was "Heavy crude - one of the important energy sources in the 21st century."

Reporting on the conference, the Xinhua News Agency quoted a member of the organizing committee as saying that the world is very rich in heavy crude, citing recoverable reserves topping 400 billion tons, or 2.7 times that of conventional crude. Annual output of heavy crude and tar sands around the world has grown from 20 million tons to 100 million tons over the past 20 years.

According to Xinhua, China has also made significant headway in heavy crude development, including the development of production bases in Liaohu, Shengli, Xinjiang and Henan, which produce 13 million tons of heavy crude output.

The Beijing conference was co-sponsored by the China National Petroleum Corporation (CNPC), the China National Petrochemical Corporation (Sinopec) and the Unitar Center.

Tarim Basin to fuel China

A string of recent exploration breakthroughs in the Tarim Basin suggests that the colossal desert area will become China's most significant source of energy supplies in the next century. The China National Star Petroleum Corp (CNSPC), the youngest oil company in the country, recently announced it had found an oilfield with geological reserves (proven reserves and controlled reserves combined) of over 100 million tons in the Tarim Basin. The Tahe Oilfield is located in the Shaya Uplift of the northern Tarim Basin.

Zhou Yuqi, CNSPC's chief geologist, attributed the

important discovery to his company's new approaches to exploration. The China National Petroleum Corp (CNPC), the country's flagship oil company, has also made several significant findings in the Tarim Basin since the second half of 1997, according to Liang Digang, vice-president of the CNPC's Research Institute of Petroleum Exploration and Development. CNPC has drilled a high-yielding gas well in the Kuqa Depression in the northern Tarim Basin. The well, named Kela-2, pumped out 660,000 cubic metres of natural gas every day in the pilot production period. With an oil- and gas-bearing area of over 40 square kilometres, the Kela-2 gas field will become the country's largest, with reserves expected to be over 160 billion cubic metres, Liang said.

CNPC has also found another large gas field, named Yinan-2, in the northern Tarim Basin. Its controlled reserves are expected to be 160 billion cubic metres, Liang said. In the western region of the basin, a gas field named Ma-4 was located by CNPC recently. Its proven reserves are 50 billion cubic metres of gas. By the end of 1997, over 210 billion cubic metres of natural gas had been found in the Tarim Basin. In the light of these recent discoveries, the geological reserves of the basin are expected to grow to over 500 billion cubic metres in the next one or two years, Liang said.

"I am confident that over 1,000 billion cubic metres of natural gas will be proven in the basin by 2005," Liang said.

It is time to launch a feasibility study for the construction of a long gas pipeline from Urumqi to Shanghai, which will be vital to large-scale exploitation of the Tarim Basin's abundant gas resources, he said.

Besides natural gas, CNPC has also found large amounts of oil resources in the last year. In the No.1 faulted zone on the northern slope of the Tazhong Uplift, CNPC drilled several wells which have produced good results. The total geological reserves of the region are estimated at over 100 million tons of crude oil, Liang said.

CNPC has successfully bored three horizontal and inclined wells in a large buried hill in the Lunnan area, giving high-yielding oilflows. The oil reserves in the region are also expected to be over 100 million tons. CNPC's recent significant discoveries resulted from a series of new special treatment methods for seismic data and new exploration technology — in particular horizontal wells and inclined wells — Liang said. CNPC's finds have instilled confidence in foreign enterprises working in the basin. "Exxon (from the United States) and Agip (from Italy) are ready to drill wells in their contracted blocks, while the Japan National Oil Corporation is launching careful geophysical undertakings in Misaray Block," Liang said.

Several international oil giants have contacted CNSPC and showed strong interests in launching co-operation in the Tarim Basin since the company's remarkable discovery was publicized by the *China Daily*, said Guo Xiaoqiang, an official with the young oil company.

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Philippe Lin, deputy general representative of TOTAL General Representation in China, welcomed the exploration breakthroughs and said the Chinese Government should draw up more specific regulations and more favourable policies to promote foreign co-operation in the basin.

The 560,000-square kilometre basin is the world's last large oil-bearing basin to be developed. According to the second national oil and gas resource assessment conducted by the China National Petroleum Corp, the basin has 10.8 billion tons of oil reserves and 8,400 billion cubic metres of natural gas, or one-seventh of the country's oil and one-quarter of its natural gas. The extremely complex geological structure of the basin creates great difficulties for exploration and development. The main difficulty is that the oil-bearing strata in the basin are often over 5,000 metres below ground, much deeper than in China's eastern oilfields. The colossal desert that covers the basin is another headache for China's oil producers.

Arco, Texaco Contract With CNOOC To Develop China's Second Largest Offshore Oil Field

ARCO China, Inc., a wholly-owned subsidiary of Los Angeles-based ARCO, and Texaco China B.V., a wholly owned subsidiary of Texaco Inc., have entered into a new petroleum contract with the Chinese National Offshore Oil Corp. (CNOOC) to develop China's second largest offshore oil field, the Qinhuangdao (QHD) 32-6 field in Bohai Bay.

Discovered by CNOOC in 1995, the QHD 32-6 field is located approximately 250 kilometers (155 miles) southeast of Beijing in Bohai Bay. The field lies 20 kilometers (12 miles) offshore in 20 meters (65 feet) of water. CNOOC will be operator of the field with a 51 percent interest. ARCO and Texaco each has a 24.5 percent interest.

The three companies expect to complete the formal development plan by year end. Startup of the field is planned for mid-year 2001, with production reaching a sustainable rate of 60,000 barrels per day in 2002. Oil in place at QHD 32-6 is estimated to exceed one billion barrels.

"We are pleased to participate in this development," said ARCO China President Jim Weeks. "Texaco has been in the Bohai Bay since 1990 and brings a wealth of experience to this partnership. Both Texaco and ARCO have successfully cooperated with CNOOC on many ventures in China over the years."

"Both Texaco and ARCO are very pleased with the complementary strengths and core competencies that each party brings to this major commercial venture," added Texaco China B.V. President Sam Snyder. "This contract represents a new age of cooperation with China."

ARCO China currently operates China's largest offshore natural gas field, Yacheng 13-1, near Hainan Island in the South China Sea. Texaco China is part of the

CACT Operators Group which operates the Huizhou oil fields in the Pearl River Mouth area of the South China Sea.

For further information, contact: Texaco (Houston, Texas): Paul E. Weeditz (713) 752-6475, ARCO: Albert Greenstein (Los Angeles, Calif.) (213) 486-3380.

Yellow River

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Separately, Binnie Black & Veatch has just been appointed by the Shanxi Wanjiashai Yellow River Diversion Project to provide project management systems, construction supervision support, contract management and administrative support, and engineering Quality Assurance systems for the massive diversion of the Yellow River to provide water to the cities of Taiyuan, Datong, and other communities near Beijing. Scheduled for completion in four years, this vast inter-basin water transfer project consists of underground cavern and surface pumping stations, 140 km of hydraulic tunnels, and pumping machinery. Because of the Yellow River's seasonal flows, water must be taken from a large area at specific times. BBV shares the project with Mott MacDonald.

China To Undertake Environmental Protections

According to reports filed by the *Xinhua News Agency*, Li Peng, chairman of the Standing Committee of China's National People's Congress (NPC), outlined a number of initiatives the country is undertaking to enhance environmental protections, at the sixth General Assembly of the Asia-Pacific Parliamentarians Conference on the Environment and Development, held in Guilin.

The chairman discussed the serious flooding on the Yangtze, Songhua and Nen Rivers which took place this past summer, attributing the situation to abnormal climate changes and very heavy rains. Soil erosion and destruction of forests further compounded the problems.

According to Xinhua, Peng emphasized that China's capacity to fight disasters must be improved, and that the CPC, Chinese government and NPC have committed themselves to doing so, while simultaneously taking into consideration long-term development in China.

In citing examples, the news agency reported that Peng highlighted several outcomes of the Third Plenary Session of the 15th Central Committee of the CPC, held recently in Beijing. Decisions were made to increase construction related to water conservation and to accelerate the control of large rivers, such as the Yellow and Yangtze, and large lakes, such as the Taihu, in order to improve the country's ability to deter natural calamities and improve the overall environment.

Peng told *Xinhua* that the Chinese government has established China Agenda for 21 Century, with the goal of implementing programs for sustainable development. The new Agenda will also seek to increase legislation related to environmental protection, enforce current legislation and develop a legal environmental framework. 🌱

Taipower Management Reshuffled

Early last month, the state-owned Taiwan Power Company (Taipower) underwent a major management reshuffle of Taipower's seven vice presidents and three other senior positions. Taipower Chairman S. C. Hsi and President J. H. Kuo were officially appointed to their present positions on July 10, 1997. On July 6, 1998, Chairman Hsi and President Kuo completed a major reshuffle of the upper management structure. Taipower's new upper management structure and areas of responsibility are listed in descending rank:

Vice Presidents:

M. T. Tsai is in charge of (1) Nuclear Operation Department, (2) Nuclear Safety Department, (3) Radioactive Waste Management Department, (4) Nuclear Safety Committee, and (5) Nuclear Emergency Planning Executive Committee.

C. T. Hsu is in charge of (1) Business Department (also Richard) responsible as key negotiator of power purchase agreements with independent power producers (IPP), and (2) Information System Department.

S. C. Lai is in charge of (1) General Planning Department (including IPP), (2) Power Development Department, (3) Environmental Protection Department, (4) Pollution Control Committee, (5) Quality Control Department, (6) Public Affairs Department, (7) Communications Center, (8) Mainland Power Industry Research Task Force, (9) Incentive Award Committee, (10) Integrated Management Improvement Committee, and (11) Power Development Foundation.

W. L. Shen is in charge of (1) Safety and Health (Walter) Department, (2) Personnel Department, (3) General Administration Department, (4) Anti-Corruption Department, (5) Legal Affairs Office, (6) Training Center, (7) Safety Control Center, and (8) Employees Relation Committee.

C. C. Lin is in charge of (1) Design & Construction Department, (2) Pumped Storage Power Project Office, (3) New Tienlun Power Project Office, (4) Liyutan Power Project Office, (5) Hoping Power Project Office, (6) Nuclear Engineering Department, and (7) Department of Nuclear & Fossil Power Projects.

L. C. Sun is in charge of (1) Finance Department, (2) Accounting Department, (3) Supply Department, and (4) Power Equipment & Material Localization Executive Committee.

Can-charng Lee is in charge of (1) Production Department, (2) System Operation Department, (3) Fuel Department, (4) Telecommunication Department, (5) Eastern Power Office, (6) Emergency Power Supply Center, (7) Department of Power Equipment Repairs & Maintenance, and (8) Power Automation Committee.

Chief Engineer: S. N. Lin is in charge of (1) Electrical System Department, (2) System Planning Department, (3) Transmission & Substation Project Department, and presides over Power Supply meetings.

General Manager, Power Research Institute: Y. Y. Chiou is in charge of (1) Power Research Institute, and (2) Testing Laboratory. Mr. Chiou reports directly to Taipower's President.

Director, Internal Auditing Office: W. J. Tsai is in charge of the International Auditing Office. Mr. Tsai reports directly to Taipower's President.

Information above provided by the American Institute in Taiwan (AIT), a private non-profit corporation established to carry out relations between the people of the United States and the people on Taiwan. For further information, contact the AIT Commercial Section at Tel: 886/2/272-1550, Fax: 886/2/2757-7162, Internet: <http://ait.org.tw>.

Changing Market of Natural Gas Conference

On October 1, 1998, the American Institute in Taiwan co-sponsored an international conference on the "Changing Market of Natural Gas" along with Taiwan Legislative Yuan's Association for Sustainable Development, Council for Economic Planning and Development, Environmental Protection Administration, Energy Commission of the Ministry of Economic Affairs, Mobil LNG & Power Inc., Chinese Petroleum Corporation, Taiwan Power Company, and several IPP investors. Over two hundred delegates from private industry, legislators, researchers, and government agencies attended the seminar. The purpose of the conference was to explore possible strategies for accelerating the use of natural gas in Taiwan.

According to reports *CER* received from the American Institute in Taiwan, the gas market in Taiwan is currently under transition. The Taiwan authorities held a National Energy Conference in May 1998 in order to discuss ways to accommodate the "Kyoto Protocol" on global CO₂ emissions. Emerging from the conference was a consensus among policy-makers that expanding the use of natural gas should be one of the top priorities of Taiwan's energy policy. The purpose of this international conference on the changing market of natural gas was to explore possible strategies for accelerating the uses of natural gas in Taiwan. International experts were invited to exchange ideas with local industrialists, government officials, legislators, and researchers on these important issues.

The Energy Policy and Outlook of Taiwan was the keynote speech of the conference. Dr. C. Y. Chen, Executive Secretary of the Energy Commission, presented the keynote speech and stated that the demand for energy has increased roughly 10 fold every decade in Taiwan and manufacturing industry is the main consumer of energy. Taiwan's objective is to establish a stable supply and demand system for energy. Dr. Chen expressed that Taiwan authorities have a strong desire to achieve Kyoto emission standards and expressed interest in increasing the use of natural gas, but noted the high cost and lack of such infrastructure in Taiwan.

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Calendar

- Sept. 30-Oct. 2 **Seventh Annual World Economic Development Congress** **Washington, DC**
This annual conference, presented in partnership with Grant Thornton, convenes over 1200 of the world's premier decision makers including government ministers, industry leaders and key international investors with a focus on international investment for the development of infrastructure in emerging markets. This year's conference includes a special session on "*Infrastructure Project Finance and Efficiently Closing the Deal in China*." For further information, contact: Customer Services Administrator, World Economic Development Congress, 500 West Cummings Park, Suite 5200, Woburn, MA 01801-6503, Tel: 800-767-9499, Fax: +781-939-2505, E-mail: registrar@worldcongress.com, On-line: www.worldcongress.com.
- Oct. 6-9 **IMI Power Supply Expo 1998** **Dalian**
Dalian will host the 4th International Electric Power Supply Equipment Exposition. The show was previously held in Shanghai, Guangzhou and Xi'an. This is the first time that this show will be held in northeastern China, which is well-known for its well developed heavy industries. The Expo is organized by the China Electric Power Supply Entrepreneur Association/China Council For The Promotion Of International Trade, Dalian Sub-Council/Coastal International Exhibition Co, Ltd and supported by China Electricity Council/Dalian Municipal Government/Northeast China Power Administration. The show is sponsored by 171 large and medium sized electric power supply enterprises. For further information, contact: Andrew Chau, Project Manager, Coastal Int'l Exhibition Co, Ltd., Room 3808, China Resources building, 26 Harbor Road, Wanchi, Hong Kong, Tel: (852) 2827 6766, Fax: (852) 2827 6870, E-mail: general@coastal.com.hk, Web:www.coastal.com.hk.
- Nov. 11-13 **Energy Efficiency & Cogeneration Conference and Exhibition** **Universal City**
The California Energy Commission together with Dynasty Marketing & Management Int'l, Inc. are drawing together representatives of Chinese companies interested in making their facilities energy efficient, in reducing air pollution and in exploring options for on-site power and steam generation/cooling. Organizers say that this conference will attract companies specializing in cogeneration, energy efficiency, other power generation technologies, financing, project development and more. For more information, please contact the California Energy Commission, 1516 Ninth Street, MS2, Sacramento, CA 95814, Gitte Jensen 916.654.4521, Jim Miwa, 916.654.4642 or fax 916.653.1435.
- Dec. 9-11 **Power-Gen International** **Orlando**
The largest annual conference and exhibit in the power generation industry includes industry papers on China. For further information, contact: PennWell, 1421 S. Sheridan Road, Tulsa, OK 74112, USA, Tel: +918.831.9160, Fax: +918.831.9161, powergen@pennwell.com.

Taiwan Focus

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Topics Discussed

Jim Wilson, Director, Office of Energy, Infrastructure, and Machinery, U.S. Department of Commerce addressed: International Experiences of the Development of the Natural Gas Market; Private Sector Participation in Infrastructure Projects: APEC Experiences and Perspectives. According to Mr. Wilson:

— Private sector will bring financing, new technologies and effective management.

— Competition in the infrastructure marketplace improves supply and quality of service. It also provides discipline and motivation to control costs.

—The 1997 APEC Natural Gas Initiative will accelerate the natural gas investment in supplies, infrastructure and trading networks by identifying barriers to investment and by recommending policy options.

— Governments need to identify structural and regulatory deficiencies and make difficult, short-term,

political decisions.

— Natural gas infrastructure is capital intensive and involves many risks: commercial, currency and exchange, political, regulatory.

— Barriers to private investment include:

—Absence of political and regulatory framework

—Absence of fiscal regimes that recognize risks to developers and investors

— Absence of open, transparent and competitive markets throughout gas chain

— Inefficient pricing of natural gas, natural gas-related goods, and services

—Recommendations primarily revolve around:

— Establishing a transparent and non-discriminatory framework in the legal, fiscal, regulatory and trade regimes.

— Promoting competition between energy sectors and negotiation within sectors.

— United States supports APEC Natural Gas Initia-

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Black & Veatch Awarded Contract

Westinghouse has awarded B&V a contract to provide engineering, procurement, and technical advisory services for selected balance-of-plant systems in the turbine island at the Henan Yuzhou Thermal Power Project in China owned by Henan Provincial Electric Power Corp. The 2 x 350 megawatt coal-fired power plant is valued at more than \$300 million and will be ready by April and August 2001, respectively, for each of the two units at the greenfield site. Westinghouse is the turbine-generator supplier, as well as the prime contractor. Harbin Boiler Co. is the subcontractor for the boiler.

The project is being financed by the Asian Development Bank. The two 350 megawatt steam turbine-generators will be built in Westinghouse's North American factories and various stationary components and services will be supplied by Westinghouse joint venture partners in China. The much-needed power from the plant will be used to supply electricity to the local infrastructure of Henan Province, the most populated Province in China.

Fortistar Capital Inc. Signs Power Plant Deal In Hebei

Fortistar Capital Inc. of White Plains, New York signed a power plant joint venture in Hebei Province last month with Chinese industrial conglomerates Hebei JiJin Industry General Company and Tianjin Li Tong Trading General Company to complete development and construction of power project which will initially provide 24 megawatts of electricity and comparable amount of steam. The joint venture, which is named Hebei Xin Le Xinda Thermal Power Com, Ltd., is owned 80 percent by Fortistar and 10 percent by each of the Chinese sponsors. Construction, says Fortistar, is well underway and completion of the first phase is scheduled for mid 1999.

The project is located in Xin Le City approximately 150 miles southwest of Beijing and 20 miles from Shijiazhuang, the capital of city of Hebei province. The total cost of the the power project will be approximately \$27.5 million. Xin Le City's rapid growth and its logistical advantages on a new superhighway ten minutes from an international airport have earned the project a special designation from the provincial government as being essential to the improvement of the province. The project will provide electricity and steam from the growing needs of the industries and people located in and around Xin Le City. When completed, the project will be the only power plant located in Xin Le City and it will provide approximately 40 percent of the local power demand. Plans are to expand the project to 45 megawatts over the next few years. The project will also have the exclusive right to supply all of the city's steam requirements for the next 20 years. By replacing many old and inefficient boilers, the power plant will improve the local environment.

Mark Comora, President of Fortistar states that "China has an overwhelming need for power and Fortistar is in a unique position to participate in this growth. Fortistar is focusing its efforts in China on Hebei Province because of this power need and the proximity of Hebei Province to Beijing. Fortistar said in a prepared statement that Hebei Province will require the addition of more than 9,000 MW with equivalent district heating by the year 2001, and that local project sponsors recognize that such a magnitude of electric and steam demand can only be met with a significant input of foreign capital. By concentrating its efforts on projects in Hebei Province, Mr. Comora believes that Fortistar's ability to capitalize on its relationships in the Province will be an immeasurable benefit to their long-term stability and success once completed.

Fortistar, formerly Commercial Union Capital Group, has now signed three joint ventures in Hebei Province and is working on several others. In addition to its China activity, Fortistar has successfully developed two projects in the United States, and has acted as a principal or advisor in the acquisition of more than 25 projects.

Progress Report: Ling'ao Nuclear Power Station

The Chinese press has reported that construction of a nuclear power station in Guangdong Province, in south China, is moving forward. By the end of 1998, the equivalent of nearly US\$1 billion dollars had been invested in the project, which commenced in 1997. The Ling'ao station is expected to cost a total of US\$4.02 billion dollars at completion.

The new station is only the second power station of its kind in the province, the first being located at Daya Bay. Ling'ao will incorporate four one million kw generating units. According to Xinhua, the first is expected to be put into operation in the year 2002, with the second going on line in 2003. It is expected that elements of the design, equipment and facilities of the new station will be developed domestically, Xinhua reports.

Electric Grids Scheduled For Improvement

In an effort to boost economic development, Jiangxi Province, located in the eastern section of China, will be investing 4.57 yuan into rural electric grid improvements. The work is reported to be completed by the year 2000.

The project will improve 135,000 kilometers of low-voltage lines. In addition, 59,400 of the province's 10 kilovolt transformers, with a total capacity of 2.56 million kilovolt amperes, 231 of its 35 kv substations with 900,000 kva total capacity, and 24 of its 11 kv substations with 510,000 kva total capacity, will be upgraded.

Electricity consumption in rural areas averaged only 221 kwh per capita last year, almost 177 kwh less than the Chinese national average.

Taiwan To Invest

The state-run Taiwan Power Company (Taipower) plans to invest US\$ 3.72 billion for construction of the Tatan Combined Cycle Power Project, according to U.S. press reports. The power plant will have approximately 10 units with a total installed capacity of 4,000 MW. In March 1999, Taipower plans to open tenders for project equipment, provided land acquisition proceeds smoothly. The first unit is expected to be completed in July 2002 and the final unit in December 2006. U.S. firms are encouraged to contact Taipower directly for new trade opportunities, especially on steam turbines, gas turbines, and boilers.

Taipower has been planning on construction of the Tatan Combined Cycle Power Project for the past three and half years. Taipower has been unsuccessful in acquiring the land needed for building the power plant. The plant site is located in Kuan Ying Village in Taoyuan County, approximately 60 kilometers from Taipei.

In June 1998, Taipower's Tatan project passed Taoyuan County Government's land price assessment, the last required procedure to be completed before Taipower is eligible to build the power plant. The Taoyuan County Government also published in June 1998 a land development plan for the area, including the planned Tatan project, for public review. This public review will last for three months. If there are no disagreements with private landowners on the published land lot, the Taoyuan County Government will purchase the land from the landowners and then resell it to Taipower. Taipower expects to acquire the land from the Taoyuan County Government by the end of December 1998.

Taipower expects to issue tender announcements for the Tatan project in March 1999 assuming land acquisition proceeds as planned. Contract awards will be made by June 1999. The first unit is expected to be completed in June 2002 and the last unit in December 2006.

Taipower plans to buy approximately 10 sets of steam turbines, 20 sets of gas turbines, and 20 sets of boilers for the Tatan Combined Cycle Power Plant. The above-mentioned equipment will be purchased from foreign suppliers. The equipment purchases are worth approximately 60-70 percent of the project's total budget. Suppliers are required to be pre-qualified for bidding on the equipment. Taipower plans to prepare bidding documentation when the land for the project is procured.

For further information, U.S. firms wishing to take advantage of new trade opportunities on steam turbines, gas turbines, and, boilers are encouraged to contact:

Taiwan Power Company, Department of Nuclear & Fossil Power Projects, 39 Ho-ping East Road, Sec.1, Taipei, Taiwan, Tel. 886-2-2394-9621, Fax: 886-2-2391-0281, Contact: Chi-lin Wu, Project Manager, Tel: 886-2-2881-2343, Fax: 886-2-2881-5130., or the Commercial Section/American Institute in Taiwan, Suite 3207, 32/F, 333 Keelung Road, Sec. 1, Taipei, Taiwan, Tel. 886-2-2720-1550, ext. 385 or 331, Fax: 886-2-2757-7162. ☎

Taiwan Focus

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tive because it will further cooperation, trade, growth and development in the APEC region.

How to Utilize BOT/BOO to Construct a LNG Terminal

Mr. C. S. Lee, Vice Chairman, Council for Economic Planning and Development & Dr. Y. L. Huang, Professor, Chiao Tung University presented the following key points:

— The role of government in the liberalization of natural gas must be considered carefully. Taiwan authorities need to provide legal framework to guide private participants into the market. Participants need to be assured of profits.

Divide Taiwan into zones to utilize BOO/BOT to construct LNG receiving terminals. Taiwan currently has one LNG receiving terminal and possibly can accommodate two to three additional receiving terminals on the island.

Sites for construction of offshore receiving terminal are limited in Taiwan.

Wheeling through LNG Terminals and Pipelines: Pros and Cons

Mr. A. W. Perry, President, Trunkline LNG Company, presented the following key points:

Deregulation has resulted in cost savings, increased customer flexibility, an array of customer services, and innovation. On a negative side, numerous companies have been taken over by more adaptable competitors. Marketers resulted from deregulation. They purchase gas from producers and find buyers, or simply broker the gas.

Interconnected open access pipeline system allows quick and convenient movement of gas to consumption centers.

Natural gas is better than petroleum because it is not expensive to store or sensitive to seasonal fluctuations.

LNG for the Power Generation Market--Current Situation and Outlook for LNG Power Plants

Mr. K. Hsu, Director, Power Development Department, Taiwan Power Company, presented the following key points:

Taiwan Power Company's (Taipower) existing LNG power plants include:

- Talin Combined-Cycle No. 5 GT(500MW)
- Talin Combined-Cycle Nos. 1-4 GT
- Talin Thermal LNG No. 6 (550MW)
- Nanpu Combined-Cycle Nos.1-3 GT (290MW x 3)
- Hsinta Combined-Cycle Nos.1-5 (435MW x 4)

In 1997, the annual consumption of LNG for the above power plants was 2.185 million metric tons.

Taipower's LNG-fueled power plants under construction
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tion:

- Nanpu Combined-Cycle No. 4 GT (220MW) expects to be used for peak load operation in January 2000.
- Tunghsiao Combined-Cycle No. 6 (320MW) will be on line in December 1998.
- Tatan Combined-Cycle Nos. 1-6 (4,000MW) scheduled to be in commercial operation in 2002.
- Three Independent Power Plants (IPPs) are proposed for design and construction for foreign and private investment:
 - Ever Power Thermal Power Plant (450MW x 2) are scheduled to be in operation in July 1999.
 - Chiahui Thermal Power Plant (670MW) is scheduled to be in operation in July 2001.
 - Hsintao Thermal Power Plant (200MW x 3) was scheduled to begin operation in July 1998 but it was delayed.
- To promote coal generation from 3 to 6 million MW by 2020.
- Natural gas only supplies 6% of the energy supply in Taiwan. Taipower wants to increase to 16% of installed capacity generation in 2020.

LNG for Cogeneration in Taiwan: Industrial and Commercial Uses

Mr. J. P. Chen and Mr. H. H. Wu, Chairman and Director of Chinese Cogeneration Association respectively, said that cogeneration is projected to grow from 4-11%; Petroleum is 60% contributor for cogeneration; the price is too high to develop co-generation systems for natural gas installations of pipelines, which need to be underground.

Conference Conclusion Overview

Natural gas still remains an expensive option for meeting future energy demands. Taiwan, however, still wants to increase the use of natural gas, and increase capacity of terminals. Taiwan authorities must play a

large role in legislation. What they decide must be followed and supported by the market. Energy Commission is looking for technologies and alternatives that will reduce emissions and help compliance with emission standards set at Kyoto Accord.

Organizers

The following agencies and companies sponsored and attended the conference:

- American Institute in Taiwan
- Association for Sustainable Development of the Legislative Yuan
- Council for Economic Planning and Development
- Environmental Protection Administration
- Energy Commission, Ministry of Economic Affairs (MOEA)
- Commission of National Corporations, MOEA
- Chinese Petroleum Corporation
- Taiwan Power Company
- Mobil LNG & Power Inc.
- Nissho Iwai of Taiwan
- Ever Power Company, Ltd.
- Chia Hui Power Corporation
- Hsin Yu Cogeneration Company, Ltd.
- Dahin Group
- Energy & Resources Laboratories, Industrial Technology Research Institute (ITRI)
- The Gas Association of the Republic of China, Taipei
- Chinese Cogeneration Association
- Chung-Hua Institution for Economic Research

For further information, contact the American Institute in Taiwan (AIT), a private non-profit corporation established to carry out relations between the people of the United States and the people on Taiwan, at Tel: 886/2/272-1550, Fax: 886/2/2751-7162, Internet: <http://ait.org.tw> and at www.ita.doc on the Internet.

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