Hitachi's Energy Conservation and Environmental Activities in China

—Progress of Energy Conservation and Environmental Projects

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OVERVIEW: Since establishing the China Energy Conservation and Environment Commercialization Promotion Project Team in April 2006, Hitachi (China) Ltd. has been involved in a wide range of activities aimed at building its energy conservation and environmental businesses in China. Working with other Hitachi companies, Hitachi (China) Ltd. has facilitated and undertaken a variety of projects involving cooperation on energy conservation and environmental protection, including a model project for energy saving and utilization of waste heat/pressure in Yunnan Province, an energy efficiency assessment model project in Ningbo City, and joint projects with the National Development and Reform Commission.

INTRODUCTION

AVERAGE annual growth in China's gross domestic product (GDP) exceeded 10% over the five year period from 2006 to 2010. With GDP growth of 9.2% in 2011 and a forecast of close to 10% for 2012, this rapid economic growth is continuing. Further expansion in domestic demand is also anticipated, with the provision of social infrastructure such as power, transportation, water, and information technology (IT) being expected to pick up pace over a wide area, including the northeast and interior regions as well as the coastal provinces. In addition to economic growth, there is also a need to create a society that is conscious of the environment, such as a low-carbon society and green economy.

Taking note of this rapidly growing market and with reference to China's 12th Five-Year Plan (2011 to 2015), Hitachi has formulated and is implementing its own China Business Strategy 2015 based on taking advantage of group synergies and expanding local operations with the aim of contributing to the advancement of Chinese society.

This article shows what Hitachi is doing that can contribute to energy conservation and environmental protection in China by describing this work along with the progress of its projects.

PAST ACTIVITIES

Since setting up the China Energy Conservation and Environment Commercialization Promotion Project Team in April 2006, Hitachi (China) Ltd. has been involved in a wide range of activities aimed at building its energy conservation and environmental business in China. At that time, building a sustainable society characterized by energy conservation and protection of the environment had been identified as an important strategy in China's 11th Five-Year Plan (2006 to 2010), and it was anticipated that China could learn from the experience of other countries, particularly from the way that Japan overcame environmental contamination and pollution in the 1960s and was able to successfully combine economic growth with protection of the environment.

At the end of 2005, the State Environmental Protection Administration (now the Ministry of Environmental Protection of the People's Republic of China) and China Central Television (CCTV) developed a television series called "A Window on Environmental Protection in Japan—Japan's Closed-loop Economy" about how Japan incorporated recycling into its economy and how this has progressed over time. Along with other well-known Japanese companies, Hitachi was featured in the programs and cooperated in their production. A production crew visited Japan in April 2006 where, among other things, they filmed major Hitachi plants and laboratories as well as Shinjuku District Heating and Cooling Center to which Hitachi had supplied a large cooler. This footage was subsequently broadcast nationwide in China by CCTV and helped raise awareness of Hitachi's advanced technology (see Fig. 1). Since then, Hitachi has actively accommodated filming and interviews by numerous major Chinese media agencies. It has also presented itself at trade fairs around China as a company that creates environmental value (including at the Shenzhen High-tech Fair and the Kunming International Environmental Protection & Renewable Energy Exposition).

Fig. 1—Scenes from CCTV Television Broadcasts.
Coverage of Hitachi's work on the closed-loop economy was included in the Green Space (epiphany on recycling) program on the science and education channel (channel 10) of China Central Television (CCTV) on September 14, 2006.

A web site devoted to the environment and energy conservation was launched in China in 2007. The site actively promoted Hitachi's brand image of being a company dedicated to the environment and energy conservation. In addition to reaching an agreement with the National Development and Reform Commission to pursue cooperation in the environmental and energy conservation fields in January 2007, three separate conferences (Energy Conservation and Environmental Protection Technology Exchange Conferences) were also jointly hosted.

The first of these (held in January 2007) had as its main theme, "energy saving technology for electrical machinery systems." The technology conference provided an opportunity to discuss specific topics with the participants, and presented Hitachi technology, past projects, and other material on such subjects as "trends in energy conservation in Japan, and Hitachi's involvement," "energy saving in electrical machinery systems," and "technology for energy-saving engineering" aimed at other companies whose businesses are steel, coal, electric power, petrochemistry, and cement, etc. The second technology conference (held in May 2007) focused on water treatment with presentations on "development of the next generation of water treatment technology," "work on membrane separation technology," and "new technology for more advanced sewage treatment." An agreement on joint research on environment by Sichuan University, Hitachi (China) Ltd., and Hitachi Plant Technologies, Ltd. was also signed. The topic of the third technology conference (held in January 2008) was "eco-cities," and discussions were held on subjects such as "cogeneration," "power generation from heat produced during waste processing," and "financing service for energy conservation and environmental protection projects."

MODEL PROJECT FOR ENERGY SAVING AND UTILIZATION OF WASTE HEAT/ PRESSURE IN YUNNAN PROVINCE

Discussion with the government on the subject of energy saving in electrical machinery systems continued after the first technology conference and the Model Project for Energy Saving and Utilization of Waste Heat/Pressure through Electrical System in the Steel and Chemical Industries in Yunnan Province was signed at the Second Japan-China Energy Conservation and Environment Forum held in Beijing in September 2007. The project was one of the Japan-China Energy Conservation and Environmental Business Promotion Model Projects agreed between the Japanese and Chinese governments. This model project subsequently led to the joint undertaking of an energy conservation project involving the use of inverters with Kunming Iron & Steel Group Co. Ltd. and Yuntianhua Group, a steel maker and chemical company respectively in Yunnan Province.

Hitachi undertook engineering work to improve the energy saving characteristics of high-voltage motors and pumps used in association with boilers, and supplied high-voltage inverter systems to Kunming Iron & Steel Group and Yuntianhua Group, which entered operation in fiscal year 2008. These systems delivered energy saving gains well in excess of Chinese government targets (see Fig. 2).

ENERGY EFFICIENCY ASSESSMENT MODEL PROJECT IN NINGBO CITY

Hitachi embarked on energy conservation work based in Ningbo City in May 2008, reaching an agreement with the National Development and Reform Commission to hold a joint conference on new energy conservation projects in the form of model projects for energy conservation and reducing waste at small and medium-sized enterprises (SMEs) in China, and

Fig. 2—Work on Various Projects.
Adjustment work during a project to install high-voltage inverter systems in Yunnan Province (left) and survey work during an energy efficiency assessment model project in Ningbo City (right).

a joint agreement with the China Center for Business Cooperation and Coordination and the government of Ningbo City on the Cooperation Project for Energy-saving and Emission Reduction among SMEs in Ningbo. These projects went beyond merely supplying products and systems, also including the supply of know-how in the field of energy efficiency assessment, which Hitachi had developed for use by itself and group companies, to SMEs in Ningbo City in the form of a consulting service. Energy efficiency assessments have been conducted for 12 companies to date.

With the average benefit of implementing the recommendations of an energy efficiency assessment being a 10% saving in energy use across an entire plant, Hitachi's assessment capabilities are highly regarded by both Ningbo City and the companies that received the assessments.

JOINT PROJECTS WITH NATIONAL DEVELOPMENT AND REFORM COMMISSION

The activities of Hitachi are highly regarded by the Chinese government and this led to the signing, in November 2009, of a memorandum of understanding on undertaking joint projects with the National Development and Reform Commission in a comprehensive way (see Fig. 3). These joint projects have covered a wide range, including setting up joint companies to undertake model projects, joint research, and the training of personnel. The main focus has been on highly efficient energy systems and smart grids, water treatment systems that ensure safe water supplies, recycling and reuse of home appliances (which are becoming increasingly common in China), and the building of urban transportation systems with a small impact on the environment. The first step was the holding of the Hitachi Green Economic Technology Exchange Meeting in Beijing in March 2010, which provided an opportunity for lively debate among the more than 400 people who attended from Chinese government agencies, corporations, industry bodies, and research institutions.

JOINT PROJECTS WITH DALIAN CITY

Subsequently, after undertaking investigations under the direction of the National Development and Reform Commission, an agreement was reached with the Dalian Municipal Development and Reform Commission in Liaoning Province at the Fifth Japan-China Energy Conservation and Environment Forum in October 2010 to commence cooperation in the fields of resource recycling and the low-carbon economy (see Fig. 4). The cooperation is to focus primarily on smart grids, water treatment, and home appliance recycling, and in addition to seeking to implement model businesses using Hitachi's latest technologies, know-how, products, and solutions with support from the Dalian Municipal Development and Reform Commission and in collaboration with Dalian City partner corporations and relevant agencies, the agreement also includes embarking on investigations into such activities as new research, development, and demonstrations, with the results of this collaboration

Fig. 3—Signing Ceremony at Fourth Japan-China Energy Conservation and Environment Forum.
An agreement was signed with the National Development and Reform Commission on Good Will Joint Project for Building a Low-carbon Society and Resource and Environment Sector.

Fig. 4—Signing Ceremony at Fifth Japan-China Energy Conservation and Environment Forum.
Agreement was reached with the Dalian Municipal Development and Reform Commission to embark on collaboration in the fields of resource recycling and the building of a low-carbon society, resulting in the first model city.

to be deployed to other parts of China in the form of model case studies.

Following further investigation and fine tuning under the direction of the Dalian Municipal Development and Reform Commission, projects are now getting underway in all of the targeted fields (smart grids, water treatment, and home appliance recycling). These are summarized below.

Smart Grids

Hitachi is undertaking a model smart grid project at the Dalian Biodiverse Emerging Science & Technology (BEST) City in conjunction with the Dalian BEST City Management Committee and the Dalian BEST City Development Co., Ltd. with the aim of creating an advanced smart city. Specifically, Hitachi is supplying a proposed trial community energy management system (CEMS) along with the associated technology required for the model project as part of a trial aimed at installing a CEMS for office blocks, condominiums, schools, shopping centers, and other buildings in the pedestrian mall (1.35 km^2) being developed by the Dalian BEST City Management Committee and the Dalian BEST City Development Co., Ltd.

Also, a demonstration of visual representation of energy covering part of the region was undertaken in August 2012, and investigations into establishing this as a business in Dalian in the future will be conducted jointly.

Water Treatment

Two projects are underway in the field of water treatment. The first includes participation in investment, design, construction, and operation in conjunction with the Dalian Changxing Island Economic and Technological Development Zone Management Committee in a project involving seawater desalination and wastewater treatment facilities at a global-level petrochemical industry complex in the Xizhong Island Petrochemical Industrial Park located in the zone administered by the committee. In addition to undertaking a feasibility study to determine factors such as the scope and business scheme for the project, work planned for the future on Dalian Changxing Island includes research and development into water treatment and investigating the construction of a manufacturing plant.

The second project involves a range of water treatment related activities, including water purification, water distribution, industrial waste water treatment, recycled water treatment, sewage treatment, and seawater desalination, being undertaken in Liaoning Province in collaboration with Dalian Dongda Group Ltd. Specifically, this involves working together to identify and commercialize new projects by utilizing the intelligent water system, which seeks to optimize the water cycle through the use of information and control systems for high-level integrated management of the individual water treatment systems, together with the technologies associated with each type of infrastructure. In addition to design and commercial support along with supply of specialist technology, Hitachi is also engaged in business investigations that include financing in accordance with the progress of the project. Dongda Group, meanwhile, conducts investigations into things like business schemes and the development of new projects through market research, surveys of information on specific projects, and analysis of project feasibility. The first step in the collaboration is the undertaking of a water cycle model project for the Dalian National Bio-industry Model Zone being developed by Dongda Group.

Home Appliance Recycling

Hitachi is supplying recycling technology and plant operating know-how it has built up through the home appliance recycling business it operates in Japan to Dalian Huan Jia Group Co., Ltd., a recycler in Dalian City, in the form of plant design engineering and operational consulting. Through collaboration on the construction of home appliance recycling plants with features such as advanced technology and cost performance, Hitachi is seeking to help build a resource recycling society in China.

JOINT PROJECTS WITH CHONGQING CITY

Following on from the joint projects with Dalian City, and representing a second wave of projects, Hitachi signed a memorandum of understanding on collaboration in fields such as resource recycling and the low-carbon economy with the Liangjiang New Area of Chongqing City in October 2011. Liangjiang New Area in Chongqing City is the third sub-provincial new area ratified by the State Council of the People's Republic of China, following Pudong in Shanghai and Binhai in Tianjin. It is also the only national-level new area in inland China. In addition to opening up new model businesses in this area, Hitachi, Ltd. and Liangjiang New Area are currently considering the scope and nature of their collaboration

in fields such as the Internet of things, smart grids and smart communities, electric vehicles, solar power generation, wind power generation and inverters, railway systems, cloud computing, and the closed-loop economy. The plan for the future is to undertake specific projects like the joint projects with Dalian.

CONCLUSIONS

This article has described what Hitachi is doing in the fields of energy conservation and environmental protection in China by describing that work along with the progress of its projects.

Hitachi is deploying energy systems, water treatment systems, energy-saving machinery, technologies for preventing atmospheric pollution, and other technologies in the Chinese markets for energy conservation and environmental protection, and has been involved in numerous projects under the cooperation of the Chinese government. In the future, in addition to continuing to supply its know-how, technology, products, and services, Hitachi will also engage in activities that expand the options for customers by turning services into businesses. Hitachi will also strengthen its involvement with new forms of energy as well as renewable energy like wind and solar power. In undertaking these activities and introducing technology, Hitachi also has high expectations for state-directed support policies, including subsidies and the establishment of regulatory regimes.

China is undergoing rapid economic growth, and also has major requirements in terms of the environment and energy conservation. In the future, Hitachi aims to contribute by doing its utmost to become "The Most Trusted Partner in China."

REFERENCE

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