Development and Cooperation of China Power Transmission and Transformation Technology

TBEA Co., Ltd.
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I  Overview of Chinese electric power industry development
II  Introduction of typical enterprise – TBEA Co., Ltd.
III  Experience and vision of TBEA Co., Ltd. for implementing international electric power technology cooperation
I Overview of Chinese electric power industry development

1 Development history of Chinese electric power industry

2 Representing electric power technology, “one ultra and four larges” creates a new era for the world’s energy conservation and power transmission
1 Development history of Chinese electric power industry

It ranks the first in the world in the aspect of power generation scale. By the end of 2012, there was a rapid growth in domestic electrical installation capacity and power generation capacity, the capacity of domestic power generation equipments reaches 1.145 billion kW. While the domestic power generation capacity reaches 4977.4 billion kW/h, the increment compared with last year is 5.22%.

The total power grid scale in China ranks the first in the world. By the end of 2012, the loop length of domestic electric transmission wire at the voltage not less than 220 kW was 507000 km, and capacity of public power transmission and transformation equipments reached 2.28 billion kVA.
I Overview of Chinese electric power industry development

- In 1949: 1850000 kW
- In 1978: 0.103 billion kW
- In 1987: 0.217 billion kW
- In 1995: 0.319 billion kW
- In 2000: 0.44 billion kW
- In 2004: 0.508 billion kW
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- In 2012: 1.145 billion kW

Years:
- 1 year
- 4 years
- 5 years
- 8 years
- 9 years

Timeline:
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- 1978: 0.103 billion kW
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Representing electric power technology, “UHV Power Grid and New Energy Industry, New Material Industry” creates a new era for the world’s energy conservation and power transmission.

“UHV Power Grid” means 1000 kV ultra-high voltage AC and positive and negative 800 kV ultra-high voltage DC project. “New Energy Industry and New Material Industry” means intensive electric power development mode with the core of million kV large-scale thermal power, large-scale hydropower, large-scale nuclear power and large-scale renewable energy sources bases.
In December 2009, the world first positive and negative 800 kV ultra-high voltage DC transmission experiment and demonstration engineering from Yunnan to Guangdong was put into operation, the overall length of which is 1438 km, and the electricity transmitted can reach 5 million kW.

In January 2009, the world first commercially operated 1000 ultra-high voltage AC transmission experiment and demonstration project from southeast of Shanxi to Nanyang to Jingmen was put into operation, the overall length of which is 654 km, and the natural transmission power can reach 5 million kW.
(2) Hydropower and thermal power projects with capacity more than 1 million kW

In 2006, the first domestic 1 million kW thermal power generating unit in China was put into operation in Zou County, Shandong.

In 2008, the world largest hydropower project – Three Gorges Project was constructed and put into operation, and the total installation capacity can reach 22.4 million kW.
I Overview of Chinese electric power industry development

(3) Nuclear power projects with capacity more than 1 million kW and renewable energy sources

The first nuclear power station (Phase I of Qinshan Nuclear Power Plant) established in China in 1983 started power generation work in 1991, which means the history of no nuclear power come to an end in China. In 2009, Taishan Nuclear Power Plant with maximum standalone installation capacity of 2*1750000 kW in China was constructed.
II Introduction of typical enterprise – TBEA Co., Ltd.

1 Overview of TBEA Co., Ltd.

2 Overview of domestic and overseas major products and projects

3 Overview of contracting for construction of whole set electric power projects in various countries
1 Overview of TBEA Co., Ltd.

TBEA Co., Ltd. is a local large-scale high and new-- tech enterprise group in Xinjiang, which inherits the 75-year manufacturing history of domestic transformer industry and the 60-year manufacturing history of electric wire and cable, developing into a backbone enterprise in the world power transmission and transformation industry, the first domestic research, development and exporting base for power transmission and transformation equipments and aluminum electronic new materials, first domestic integrator for photovoltaic system, and second domestic research and development base for solar energy silicon materials.
Company rank in 2012:
- Ranks 422 for world top 500 brands in machinery
- Ranks 12 for China top 100 brands in machinery
- Ranks 400 for China top 500 enterprise brands
- Ranks 14 in Chinese equipment manufacturing industry

On April 28, 2011, was awarded with “China Industry Award”

Obtained China famous Brand, was recognized as one of the China top 100 power enterprises in intellectual property

Obtained the supreme award “Board of Director Award” of Shanghai Stock Exchange twice

Brand value is 27.5 billion Yuan
There are 14 modern industrial parks in China, and the first overseas plant in India is under construction currently.
2 Overview of domestic and overseas major products and projects

Up until now, TBEA has undertaken first and second domestic 1000 kV ultra-high voltage AC projects, first, second, third and fourth domestic ±800 kV ultra-high voltage DC projects, and the research, development, manufacturing, service tasks for one million kW large-scale hydropower, thermal power, nuclear power, renewable energy sources projects and other national major projects and works.
Domestic major products and projects

1000MVA/1000kV AC transformer

200Mvar/1000kV reactor

World first 1000 kV ultra-high voltage AC transformer and electric reactor (Southeast Shanxi—Nanyang – Jingmen)
World first ±800kV ultra-high voltage DC converter transformer and smoothing reactor
(Yunnan—Guangdong)
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Domestic major products and projects

China first SSP-H-860000kVA/500kV transformer
(Three Gorges project Jinsha River Xiluodu Hydropower Station)
Domestic major products and projects

DFP-400000kVA/1000kV
World first 1000kV generator transformer
(Anhui Pingyu 2×1000MVA ultra-supercritical power generation set)
Domestic major products and projects

DFP-700000kVA/500kV Generator transformer use for world nuclear power with single phase capacity million kW unit (Guangdong Taishan Nuclear Power Station)
II Introduction of typical enterprise – TBEA

Domestic major products and projects

Expanded diameter bus used for 1000 kV power transmission and transformation project (Southeast of Shanxi—Nanyang—Jingmen)

Expanded diameter conductor used for 750kV power transmission and transformation project (Guanting, Qinghai—east of Lanzhou)
Domestic major products and projects

TBEA has poly-silicon production, research and development capacity of 15000 ton/year, has implemented 1 GW solar energy installation capacity, established nearly 5000 off-grid solar energy power stations, and ranks the first in China in the aspect of undertaking photovoltaic system project.

The largest domestic 500 kW off-grid power station (500 kW project in Ruoqiang County, Xinjiang)
As the leading enterprise in the China energy conservation and power transmission and transformation industry, TBEA has entered the world market, ultra-high voltage high-end products have already entered the main power grids in America, Russia and India, and realized the leap from equipping China to equipping the world.
First product TBEA Co., Ltd. exported to Russia, SFSZ-80000-110kV

The first transformer exported from China to America, 900MVA transformer with maximum capacity, 230 kV autotransformer
II Introduction of typical enterprise – TBEA

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Overseas major products and projects

- Reactor exported to Indian State Grid Corporation from China, 765 kV reactor product (in 2010)
- First 800 kV oiled paper condenser bushing with highest voltage level exported to Indian from China (in 2010)
3 Overview of contracting for construction of whole set electric power projects in various countries

TBEA Co., Ltd. fully participates in the power and grid construction for various countries, provides substation, power transmission and transformation wire construction general contract business, including:

- Turnkey project service integrated exploration, design, construction, commission, operation, maintenance and training
- Provide whole set of business for project financing solutions
General contract work of 220kV-500kV power transmission and transformation wire and whole set of projects for substation in Tajikistan

In the Shanghai summit of Shanghai Cooperation Organization, TBEA signed the contract for general contract work of south-north 220kV-500kV power transmission and transformation wire and whole set of projects for substation in Tajikistan. With professional, high-quality and efficient system integration service, it realized whole line running through for the project one year in advance in November 2009. New power transmission and transformation technology with green technology, energy conservation and environmental protection, informatization, unattended pattern is adopted for the project. Realized running through and electricity adjustment of state south-north power grid in Tajikistan, power transmission loss dropped from 14% to below 5%, annual energy conservation will reach 18 billion degrees, obtained high praise from government and people from China and Tajikistan, and obtained “Luban Award” of China overseas project.
Whole set project in Kyrghyzstan

South power grid reformation project of Kyrghyzstan and “Dateka -Keming” 500kV power transmission and transformation project, is the energy project with maximum preferential loan from Shanghai Cooperation Organization for TBEA Co., Ltd., the total amount for the contract is nearly 600 million dollars. The project is an important composition for hydropower rejuvenating and people life improvement strategy, major project and engineering in Kyrghyzstan, and is connected with economic and social sustainable development. The project is a major one for China and Kyrghyzstan to cooperate in the field of infrastructure construction, and it is a monument of friendship.
Whole set project in Zambia

On July 22, 2012, the Zambia 330 kV power transmission and transformation project undertaken by TBEA Co., Ltd. was commenced. The project is middle African network works; construction of railway will greatly improve power supply situation in northern and eastern provinces in Zambia, and will increase power supply to Kenya, Tanzania, Malawi and other countries, and provided a guarantee for economic and social development in Zambia.
The Whole project in India

TBEA Co., Ltd. is the main undertaker of state grid construction with highest voltage level of 765 kV in India, it undertook whole set project construction for eight 765 kV substations successively. Including main equipment research and manufacturing, equipment installation, commissioning and civil engineering construction for 73 sets of 765 kV paralleled reactor, neutral point reactor, lightning arrester, mutual inductor. This is the first time that India purchase 765 power transmission equipment from Chinese enterprise, it is also the first time that Chinese enterprise export in batches of ultra-high voltage power transmission and transformation high-end products. This action fills the blank for exporting in batches of 765 kV ultra-high voltage product of Chinese power transmission and transformation enterprise.
The Whole project in Ethiopia

In 2009, TBEA Co., Ltd. signed a contract with Ethiopia Electric Power Corporation for 400 kV power transmission wire project. This is the first time that Africa uses preferential fund project of Export-Import Bank of China. The power transmission line in Ethiopia is double-line double-loop parallel line, one loop length is about 50.3 km, the other is about 51 km, and voltage is 400 kV.
III Experience and vision of TBEA Co., Ltd. for implementing international electric power technology cooperation
1 Export mature research and development technology for power transmission and transformation product
2 Explore to establish joint venture in relevant counties
3 International cooperation vision
III Experience and vision of TBEA for implementing international electric power technology cooperation

1 Export mature research and development technology for power transmission and transformation product

TBEA has already successfully:

- Singed technical export contract with Egypt transformer manufacturing enterprises, and transferred the whole set of production technology for 220 kV transformer
- Assisted Egypt transformer manufacturing enterprises to realize independent production of 220 kV transformer
III Experience and vision of TBEA Co., Ltd. for implementing international electric power technology cooperation

2 Explore to establish joint venture in relevant counties

TBEA has already:

- Started to establish joint venture with 750 kV manufacturing capacity
- TBEA Co., Ltd. is actively exploring cooperation with governmental departments of relevant countries and powerful big enterprises, which effectively stimulated local economic development, meanwhile satisfied the local state power construction.
III Experience and vision of TBEA Co., Ltd. for implementing international electric power technology cooperation

3 International cooperation vision

TBEA Co., Ltd. has already formed systematic and mature technical transferring plan

- One-time buyout overall transferring method
- Adopting license agreement method
- Technology investment form
- Cooperation production method

TBEA Co., Ltd. is willing to implement international electric power contracting engineering in various forms (such as EPS and BOT), and we can provide financing solutions of many forms.

In the industrial chain field of TBEA Co., Ltd., especially raw material supply, we are willing to implement mutual beneficial cooperation of various methods in the aspect of exploitation and utilization of mineral resources.
Welcome friends from various countries to TBEA Co., Ltd. for visiting and guidance

The technical research and development base for TBEA Co., Ltd. headquarter has a land area of 684 mu, was commenced in March 2012, and will be completed in September of this year. It is the talent highland, innovation highland and development highland for TBEA Co., Ltd. to develop “one high and two news ” state three strategies emerging industry. It is a state level enterprise technical center for TBEA Co., Ltd. for three main industries, which is also the state level engineering laboratory, post-doctoral scientific research work station, and academician work station. It is the innovation platform for TBEA Co., Ltd. to combine power transformation production, study and research, promote green technology, intelligent environmental protection, reliable and efficient high technology, high added value product and service. It is the management and control center, decision-making center and operating center for TBEA Group, TBEA Co., Ltd. and all the enterprises in Xinjiang.
Thanks for the support and concern of friends from various of countries for TBEA. TBEA will strive to become the world reliable electric service supplier and continue to make contribution to the global energy development.
Thank You!