

## Providing Bio-power to the Dragon & the World

“China has 126 million hectares of farmland that produces more than 600 million tons of straw each year. The calorific value of straw is about half of that of standard coal. If 1/3 of these 600 million tons of straw can be used to generate electricity, it would be equivalent to around 100 million tons of coal. The large scale biomass power industry is of considerable benefit”, said Kai Johan Jiang, chairman of Dragon Power Group, during the 2010 Summer Davos in Tianjin.

Bioenergy International Beijing correspondent Xinyi Shen met Simon Parker, CEO of DP Clean Tech, the company in the group that is providing the technology for the fast biopower expansion in China and in many other parts of the world.

Dragon Power has managed to achieve remarkable growth in the renewable energy industry to become the leading biomass power company in China.

Since its inception in 2004, the company has already established 19 biomass power plants, controlling over 60 percent of China's biomass power market. Another 10 plants are currently under construction and there are plans to start construction of another 13 biomass plants this year. Power generation capacity is expected to expand to 1 000 MW by 2011.

Financial capacity has also kept pace with Dragon Power attracting the attention of the larger financial institutions.

In June 2007, the company received USD 150 million in equity investments from Citigroup. In February 2010, China Construction Bank's head office offered RMB

28 billion (USD 4.1 billion) of credit to support their construction plans, which is to establish 100 biomass power plants with a capacity of three million kW over the next 5 years.

### Integrating the biomass power supply chain

Dragon Power is one of very few companies in the world that can incorporate the entire biomass to power production chain; from equipment manufacturing and power plant operation to providing a whole range of proprietary technology.

For instance power station investment, construction and operations are run via a subsidiary called National Bio Energy (NBE) in which Dragon Power has a 75 % stake with State Grid Xin Yuan Company Ltd. owning the remaining 25 %.

NBE is the world's largest biomass power generation group. By the end of 2009, it provided

5.2 billion kWh of green power and reduced CO<sub>2</sub> emissions by 4.36 million tons.

At present, NBE has obtained approval for 40 of its projects located in twelve different regions across China.

Dragon Power Group's vertical integration across four companies gives them an ever widening service scope and since 2004 the company has:

- Established National Bio Energy (NBE) in partnership with the China State National Grid for operation of Chinese biomass power plants
  - Acquired Chinese boiler manufacturer Jinan Boiler Group
  - Acquired Danish boiler manufacturer Bioener Aps.
  - Established DP CleanTech with strong presence in Europe and Asia for the production of biomass power plants
- The combination of NBE plant operating experiences and the design, engineering and manu-



Since its inception in 2004, Dragon Power has already established 19, 100 % based biomass power plants in China, says Simon Parker, CEO of DP CleanTech, the technology company in the Dragon Power group.

– DP CleanTech speciality is to turn any given biomass into high quality steam, at high pressure and high temperature. Photo: Xinyi Shen



At present, NBE has obtained approval for its 40 projects, which are located respectively in Shandong, Hebei, Henan, Jiangsu, Heilongjiang, Jilin, Liaoning, Inner Mongolia, Xinjiang, Hubei, Anhui, Shanxi etc. (source: www.nbe.cn)

facturing know-how through DP CleanTech, has accelerated Dragon Power's global reach.

### World leader

Established in 2004 and having already built 60 biomass power plants

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Acquired Bioener (September 2009) - A Danish boiler company. Acquired Jinan Boiler Group (July 2007). Established National Bio Energy (NBE) - DP owns and operates their biomass power plants through their 75% stake in NBE and the partnership with the China State National Grid (25% share in NBE). Recently further changes in the structure was done and DP Cleantech and NBE are now owned independently.

### DP Clean Tech & Axis Technology builds a biomass power plant in Lithuania

August 26, 2010

DP CleanTech has teamed up with Axis Technologies, an EPC supplier from Lithuania to extend a pre-existing fossil fuel burning plant with a renewable biomass power plant.

The plant in Siauliai, Lithuania currently burns natural gas and heavy fuel. The owners, Siauliai Energija have decided to add a new biomass fired boiler.

DP CleanTech will provide engineering, project management, procurement, manufacturing and supervision of construction and commissioning for the complete boiler island and estimates the entire plant to be fully operational by April 2012.

The steam parameters of the boiler will be 460°C and 45 bar and the steam production will be 50 t/h.

The power plant is expected to produce 10 MW electricity and 37 MW district heating, enough power to supply 30,000 houses as well as 45% of the cities heating requirements.

The plant's performance will be enhanced though additional features that recover heat from the flue gas condensation; allowing the plant to run at 101% overall efficiency.

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The first biopower plant was built in China by Dragon Power in 2004. Now they run 19 and for the moment building 10 more.



### Shandong Shanxian 1\*25MW Biomass Power Plant

The Shandong Shanxian Biomass Power Plant Project developed by National Bio Energy Co.,Ltd is a biomass collection and utilization project in Shanxian, Shandong Province, P.R.China. It is supported with CDM Clean Development Mechanism from Denmark. The project generates power using a 1\*25MW generator unit. The central boiler system is mainly based on Danish technology. The electricity produced by the project activity is supplied to the public Shandong provincial power grid which is part of the North China grid system. This plant was the first of the new biomass power plant built.

around the world, DP CleanTech has quickly risen to become a world leader in providing biomass power plant solutions in the rapidly growing renewable energy industry.

– Our business idea is to provide high quality steam with high temperature and high pressure from any given biomass, says Simon Parker, DP Cleantech CEO.

The technology was originally developed in Denmark. Last year we bought the company Bioneer, from which earlier the technology was licensed from.

DP Cleantech CTO, Chief Technology Officer is Kennet Jørgensen, and he is stationed in Denmark where one of the main manufacturing and engineering units are located.

Manufacturing is otherwise done in multiple

locations in Europe and China.

– The suppliers of equipment are happy to work with us and benefit of our fast market growth, says Simon Parker.

– It is important for us to be able to have many different suppliers, we want to build supply chains.

DP Cleantech is not a huge company with large assets, rather more like a project- and engineering company with some manufacturing capacity in strategic regions.

– Not long ago we established a manufacturing unit in Poland, DP Poland Cleantech.

### Benefiting millions of Chinese farmers

Sixty percent of the operating costs of the biomass power plants goes toward procuring farmers' leftover straw. On average,

one mu (666.67 m<sup>2</sup>) of land produces 300 - 500 kg of straw, and the current purchase price is roughly RMB 300/ton. So it directly increases the income of farmers by RMB 150/mu.

A typical 30 MW power plant consumes 25-30 million tons of biomass and total biomass procurement costs, in cash, are around RMB 70 million.

– It is quite different here in China compared to the more industrialized agriculture in Denmark.

– In China there are much more variance in quality of the biomass, which of course puts pressure on the engineers to create well working power plants as well on the people running the plants.

– It takes time to get a deep understanding and knowledge how biomass is working, but in China

we really have strong support from the governmental policy.

The power plants also create an increasing number of jobs.

One 30 MW plant creates around 1,000 jobs, where the plant itself employes around 130 people. However each plant needs ten or so straw logistics bases,

each of which need 50 people and a large number of brokers.

An estimated 50,000 jobs direct and indirect have been created in rural areas so far.

### Combining internationalization and localization

Dragon Power's business  
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Before entering biomass energy in 2002, Kai Johan Jiang, the founder of Dragon Power, was a senior adviser for Volvo. "After consulting with my colleague, Karl Erling Trogen, who is now a director on our board, we agreed that environmental sustainability was a key to a robust future for the planet."

"We decided to establish a world-leading company choosing biomass power as our main focus. China has huge resources of unused biomass, e.g. straw has an equivalent of 500 million tons of standard coal every year."



> is rooted in rural China. Almost all employees in the plants are local with around 95 percent being recruited locally, an important factor to the success of the plant.

The company has started some interesting trials in rural areas in their cooperation with local authorities.

While they make use of the authorities' organizational resources to collect straw, the local economies benefit from the business the company provides.

Other areas include trying to cooperate with the local social security offices and insurance companies by purchasing insurance plans for farmers according to the amount of straw produced.

### International management

By contrast the management team for the company is international playing a central role in overseas marketing and strategic mergers and acquisitions.

Key persons like Kai Johan Jiang and Simon Parker with a major multi-national corporation backgrounds such as Volvo Group or Citibank Investment reflecting the company's entrepreneurial environment – overseas technology and overseas investors.

– We see a most interesting future says Simon Parker.

– In China 30 GW of biomass power will be built and the rest of the world goes in the same direction.

The world's large agro-industry is also awakening. They have understood that there is no agro waste - only agro resources, ends Simon Parker, CEO of DP Clean Tech.

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By Xinyi Shen