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## INDUSTRY OVERVIEW

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*Except as otherwise provided in this Prospectus, the information and statistics set out in this section have been extracted from various official government publications and other publications as well as the industry report we commissioned from an independent industry consultant, Frost & Sullivan. We believe that the sources of such information are appropriate sources for such information and we have taken reasonable care in extracting and reproducing such information. We have no reason to believe that such information is false or misleading in any material respect or that any fact has been omitted rendering such information false or misleading in any material respect. The information has not been independently verified by us, the Joint Global Coordinators, the Joint Bookrunners, the Joint Sponsors, the Joint Lead Managers, the Underwriters, any of our or their respective directors, officers, representatives, affiliates or other advisors or any other persons involved in the Global Offering (other than our independent industry consultant, Frost & Sullivan), and no representation is given as to its accuracy. We have engaged Frost & Sullivan to prepare the reports for use in whole or in part in this Prospectus. Our Directors confirm that, after taking reasonable care, there is no adverse change in the market information since the date of the Frost & Sullivan Report, which may qualify, contradict or have an impact on the information as disclosed in this section.*

### REPORT COMMISSIONED FROM FROST & SULLIVAN

We commissioned Frost & Sullivan, an independent advisory firm with relevant industry experience, to conduct an analysis of, and to report on, the biomass, hazardous waste treatment, solar energy and wind power industries in China. The report we commissioned, or the Frost & Sullivan Report, has been prepared by Frost & Sullivan independent of our influence. We agreed to pay Frost & Sullivan a fee of RMB1,450,000, which we consider reflects market rates. Our payment of such fee is not contingent upon the results of the report or the analysis therein. Founded in 1961, Frost & Sullivan has 40 global offices with more than 2,000 industry consultants, market research analysts, technology analyst and economists. It offers industry research and market strategies and provides growth consulting and corporate training. Frost & Sullivan has been covering the Chinese market from its offices in China since the 1990's. Its industry coverage in China includes automotive, transportation, chemicals, energy and power systems, environmental technologies, electronics, information and communication technologies and healthcare, among others. The Frost & Sullivan Report we commissioned includes information related to China's biomass, hazardous waste treatment, solar energy and wind power industries, including government regulations and initiatives, statistics relating to tariffs, waste production, waste treatment and future estimates and trends. Frost & Sullivan's independent research was undertaken through both primary and secondary research obtained from various public and private sources, as well as our management with respect to our market position. Primary research involved interviewing leading industry participants and third-party industry associations. Secondary research involved reviewing company reports, government publications, independent research reports and journals and data based on Frost & Sullivan's own research databases.

### OVERVIEW OF CHINA'S BIOMASS POWER INDUSTRY

Biomass power production is the process of transforming chemical energy in biomass raw materials, such as wood residue or agricultural waste, into thermal energy through controlled direct

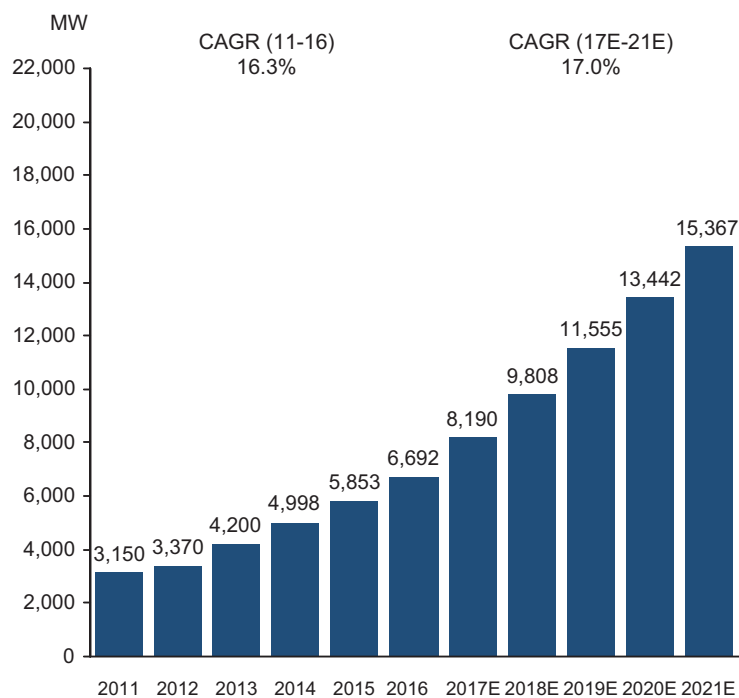
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combustion, and transforming the released thermal energy into electricity through boilers, turbines and generators similar to thermal electricity generation from other sources such as coal, oil, natural gas and nuclear power.

Biomass power generation is at its early stage of development in China. According to Frost & Sullivan, the total cumulative biomass power generation capacity represented less than 1% of the total power generation capacity in operation in China, which amounted to 1,628.7 GW as of December 31, 2016. Although biomass resources, such as firewood and agricultural residue, are abundant and have been a significant source of energy in China, particularly in rural areas, they are primarily used for conventional energy consumption such as cooking and heating, according to Frost & Sullivan. Biomass as a clean and low-cost source for electricity and heat in rural areas based on modern biomass technologies is in urgent need of development, as reflected by the goal of installing a cumulative biomass power generation capacity (including power generation capacity of waste-to-energy projects) of 15,000 MW by 2020 for biomass power under the 13<sup>th</sup> Five-Year Plan for Biomass Energy promulgated by the NEA in October 2016. According to Frost & Sullivan, the total cumulative biomass power generation capacity reached 6,692 MW as of December 31, 2016.

The following chart sets forth the cumulative biomass power generation capacity in China:

**Cumulative Biomass Power Generation Capacity in China: 2011-2021E**



Source: Frost & Sullivan Report

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### Key Drivers for China's Biomass Power Industry

#### *Favorable policy support*

According to the Medium- and Long-Term Plan for Renewable Energy promulgated by the NDRC in 2007, the PRC government set a goal to install a cumulative power generation capacity of 30.0 GW for biomass power by 2020. In order to encourage the development of the biomass power industry, the NDRC issued the Notice on Improving the Pricing Policy Regarding Electricity Generated from Agricultural Waste and Forestry Residue issued in July 2010, which set a uniform benchmark on-grid tariff of RMB0.75/kWh applicable to all biomass power projects. This is significantly higher than the on-grid tariff for conventional coal electricity, which ranges from RMB0.30/kWh to RMB0.50/kWh, according to Frost & Sullivan. Moreover, local governments have adopted specific policies to support the development of the biomass industry, including, for example, subsidies for treatment of biomass supply and reduced interest on project financing loans for biomass facilities. According to Frost & Sullivan, development of carbon emission market in China in the future, which is expected to launch in 2017, may provide an additional revenue source to the biomass industry. Such favorable regulatory environment is expected to continue in the future in support of the biomass power industry to reach the capacity target according to Frost & Sullivan.

#### *Demand for air pollution control and reduction of greenhouse emissions*

Air pollution has become a significant public health issue in China and has attracted intense attention nationwide. Public awareness and demand for pollution control is particularly acute in regions with high population density and severe pollution, including eastern provinces like Jiangsu Province, Shandong Province and Anhui Province. As compared to the incineration of biomass raw materials in the open air commonly done in rural China, which has a negative impact on air quality, controlled biomass combustion to produce electricity and heat is a low emission source of energy as it produces negligible amounts of sulfur dioxide and nitrous oxide emissions as compared with fossil fuels and is expected to play an important role in controlling air pollution in China.

In addition, the PRC government has publicly announced its commitment under the Copenhagen Accord signed in December 2009, and promised that China will reduce its carbon intensity, or CO<sub>2</sub> emission per unit of GDP, by 40-45% from the 2005 level, and to increase the share of non-fossil fuels in primary energy usage to 15% by 2020. The Paris Agreement, which governs greenhouse gases emissions measures, was adopted in December 2015 by all of the 195 UNFCCC countries including major developed and developing countries. As a leading contributor to this agreement, China has submitted an Intended Nationally Determined Contribution, pledging to hit the CO<sub>2</sub> emissions peak around 2030, slash CO<sub>2</sub> emissions per unit of GDP by 60-65% from the 2005 level, and ensure that non-fossil fuels will be responsible for over 20% of primary energy consumption by around 2030. In addition, biomass resources consume carbon dioxide during the growing cycle, and would otherwise have to be disposed of by either incineration or use as compost. To the extent that energy produced at a biomass plant replaces energy that would have been required from a coal, oil or gas power facility, greenhouse gas emissions are reduced.

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### *Enormous under-utilized biomass resource*

According to Frost & Sullivan, available biomass resources in China amounted to 239.8 million tons of straw and 154.8 million tons of forestry residues in 2010. Annual available biomass energy in China under current technology is estimated by the NEA to be 460 million tons of coal equivalent, which, according to Frost & Sullivan, would have accounted for over 10% of China's energy consumption in 2016. However, the current utilization of such resources is low, indicating strong potential for the growth of biomass power industry.

### *Construction of rural power grid and development of rural areas*

According to Frost & Sullivan, China's power grid companies have been increasing their investment in grid construction in rural areas during recent years, which may facilitate construction of biomass power plants which are typically located in those areas. According to Frost & Sullivan, two major power grid companies in China, the State Grid Corporation of China and China Southern Power Grid, have invested more than RMB500 billion in total on grid construction and improvement in rural areas during 2011 to 2016. In addition, building biomass power facilities could increase living standards, promote industrialization and generate employment in rural areas. Through payment for agricultural and forestry residue, biomass power plants also provide an additional revenue source for farmers. According to Frost & Sullivan, due to these benefits, local governments that endeavor to improve the income of farmers are expected to continue to support construction of additional biomass facilities.

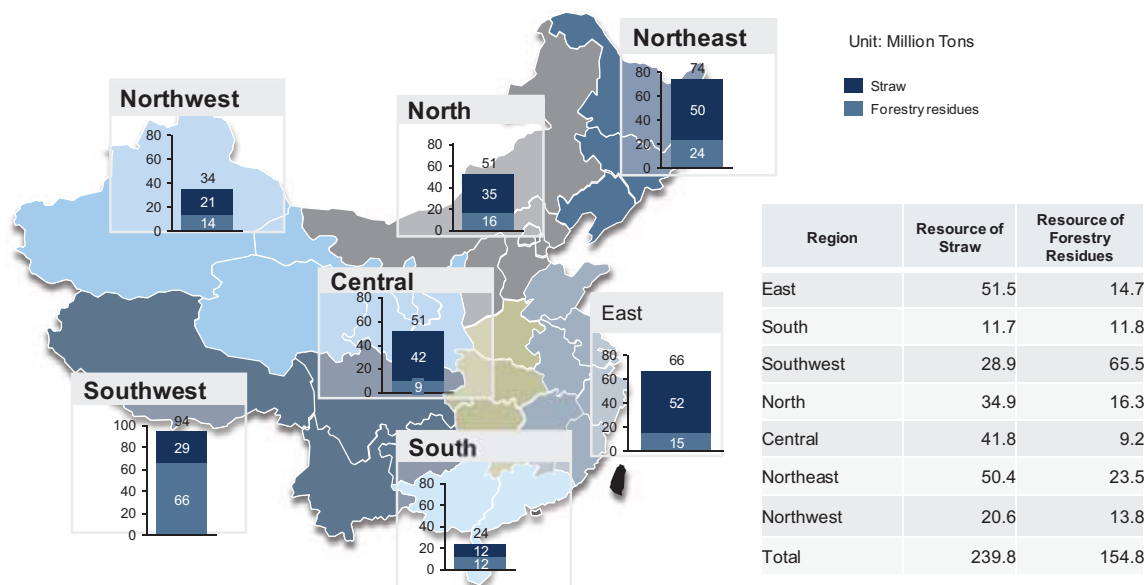
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### Biomass Supply

#### *Regional Distribution*

Regional distribution of biomass raw materials is uneven across China. Currently, the main raw materials for direct combustion biomass power generation in China are straw and forestry residues, according to Frost & Sullivan. The following chart sets forth the distribution of available straw and forestry residues in China in 2010:

**Distribution of Available Biomass Resources in China: 2010**



Source: Energy Research Institute, Frost & Sullivan Report

Note: Data in later years is not available as the survey of national biomass resource is not conducted regularly. In addition, the distribution of biomass resource is proportional to outputs of agricultural and forestry products which are stable over years.

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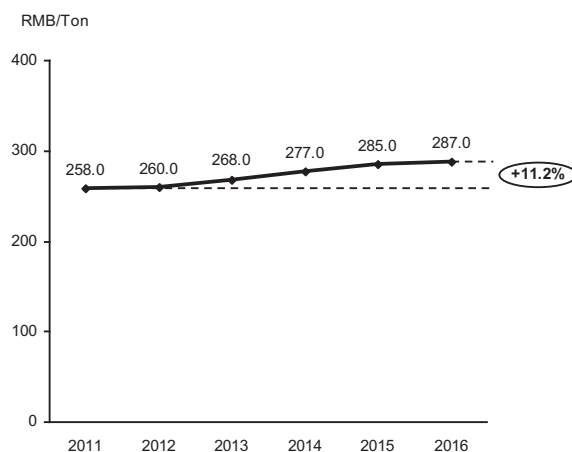
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### *Supply Networks*

According to Frost & Sullivan, land, equipment and construction costs are the major cost components at the construction stage of biomass facilities and these costs have historically fluctuated based on the time and the location of each individual project. During the operational stage, fuel supply is typically the major component of operating costs for biomass facilities. For individual batches of biomass raw materials, the price varies between RMB100/ton and RMB400/ton. The average price of biomass raw materials in China increased by 11.2% from approximately RMB258/ton in 2011 to approximately RMB287/ton in 2016. The following chart sets forth the average unit price of biomass raw materials in China for the relevant periods:

**Unit Price of Biomass Raw Material in China: 2011-2016**



Source: Frost & Sullivan Report

According to Frost & Sullivan, access to an efficient supply network is vital to the profitability of a biomass power company. Collection, transportation and storage of biomass raw materials are costly. As a result, despite the high price of biomass raw materials when it reaches the biomass power facilities, individual farmers and brokers who sell the biomass raw materials only enjoy modest income. This has reduced their enthusiasm for spending additional efforts to collect and supply biomass raw materials. As the industry develops, biomass facilities with higher operational efficiency could potentially offer higher overall purchase prices, further driving up the supply of biomass raw materials and increasing the utilization of the biomass resources in China. According to Frost & Sullivan, without efficient supply networks, players with poor management are expected to suffer losses and exit the market despite government subsidies for the biomass industry.

According to Frost & Sullivan, major players are making an effort to optimize their biomass supply system in order to lower collection cost and ensure a stable supply. In addition, pursuant to the

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Notice on the Administration of the Construction of Biomass Energy Generation Projects promulgated by the NDRC in August 2010, once a biomass facility is constructed, additional biomass facilities may not be constructed within a radius of 100km. Due to the exclusivity created by such rule, major players are investing heavily in building regional supply networks to ensure a robust supply of biomass raw materials.

### **Biomass Power Generation Technologies**

The core technology of biomass power production converts biomass raw materials to generate electricity through controlled combustion. In order to do this, the biomass material is inserted into a boiler. The combustion is controlled based on the required quantity of materials and the temperature of the air. The vapor that is produced in the boiler is then injected into a turbine, where the energy which it releases is transferred into mechanical energy. The mechanical energy produced by the turbine is then transformed into electricity by a generator.

A biomass facility may integrate other components that have synergies with the electricity generation system. For example:

- *Electricity and heat cogeneration.* A biomass facility may integrate a steam generation system to form an electricity and heat cogeneration facility. As such, the waste heat from a biomass electricity generation system may be recovered to supply heat. According to Frost & Sullivan, such integration, with mature technology and good effects of energy saving and emission reduction, improves the overall efficiency of the biomass facility. Cogeneration facilities are also encouraged by the PRC government and, according to Frost & Sullivan, have attracted more investments recently.
- *Biomass and household waste-to-energy facility.* A biomass facility may also integrate a household waste-to-energy power generation system. According to Frost & Sullivan, such combination could lower the aggregate initial investment compared to the cost of two separate facilities by sharing common components of power generation systems, and the combined system would have higher operating efficiency. However, such integration requires the capability to develop and operate both biomass facilities and waste-to-energy facilities, and according to Frost & Sullivan, only players with expertise in both biomass and waste-to-energy businesses could adopt such business model. According to Frost & Sullivan, we were the only company in China that integrates biomass and waste-to-energy in one plant under operation as of December 31, 2016.

The relevant technologies are also rapidly changing. According to Frost & Sullivan, new technologies such as high pressure/subcritical furnace and straw densification may reduce the amount of biomass raw materials required per unit of electricity generated in the near future. In addition, according to Frost & Sullivan, the development of biomass incineration technology by equipment suppliers in China and the availability of indigenous biomass boilers is expected to drive down the initial investment and improve the attractiveness of biomass projects.

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### **Environmental Impact of Biomass Power Plants**

According to Frost & Sullivan, similar to the combustion of other solid fossil fuels such as coal, the combustion of biomass materials emits air pollutants such as particulate matter (PM), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), sulfur oxide (SO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), lead, mercury and other hazardous air pollutants (HAPs). While biomass power generation generates a substantially lower level of emission than fossil fuel power generation and open air incineration of biomass materials as it produces smaller amounts of NO<sub>x</sub> and SO<sub>x</sub>, the emission of CO<sub>2</sub> per kWh of electricity generated by coal, oil, natural gas and biomass fuel are approximately 1.0 kg, 0.8 kg, 0.5 kg and 1.4 kg, respectively, according to Frost & Sullivan. Depending on the composition of biomass raw materials used, biomass power plants may emit more CO<sub>2</sub> than fossil fueled power plants as wood and certain other types of biomass materials are carbon-rich, but not particularly energy-rich, especially when compared with natural gas power plants. Biomass power plants may also be less efficient than gas and coal-fueled power plants, partly because biomass fuels tend to have relatively higher moisture content.

As such, without the implementation of proper emission control measures and the use of quality biomass materials, biomass power plants could be a source of air pollution. According to the MEP, biomass power plants with unit boiler output of over 65t/h are subject to the Emission Standard of Air Pollutants for Thermal Power Plants (GB 13223-2011) and those with unit boiler output of 65t/h or below are subject to the Emission Standard of Air Pollutants for Boilers (GB 13271-2014). Although biomass power plants have to conform to these same emission standards that also apply to coal and gas plants, the monitoring and supervision of biomass power plants are less strict than those of coal and gas plants, as the latter are more commonly identified as key pollutant sources. The lower level of monitoring and supervision of biomass plants may result in emission levels of NO<sub>x</sub>, SO<sub>x</sub> and PM that exceed the strict emission standards for coal and gas plants.

### **Competitive Landscape of Biomass Power Industry in China**

Since 2010, the number of biomass projects has been expanding. Due to the aggressive expansion of leading biomass companies, the market concentration has also gradually increased. According to Frost & Sullivan, China's biomass power market is currently led by Kaidi and NBE followed by a large amount of smaller players. Kaidi primarily occupies southern regions in China, while NBE primarily occupies northern regions in China. Chant Group has announced expansion plans in biomass power market in late 2015 and 2016, ranking as the third largest player in 2016. According to Frost & Sullivan, we ranked fourth in China in terms of aggregate power generation designed capacity of biomass projects in operation, under construction and at the planning stage as of December 31, 2016 whereas we ranked third as of December 31, 2015 although our aggregate power generation designed capacity increased from 391.0 MW as of December 31, 2015 to 616.0 MW as of December 31, 2016. We ranked eighth in terms of aggregate power generation designed capacity of biomass projects in operation in China as of December 31, 2016 while we ranked 13th as of December 31, 2015.



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The following table sets forth the market shares in terms of aggregate power generation designed capacity for all biomass projects in operation, under construction and at the planning stage as of December 31, 2016:

### Biomass Power Generation Market Shares: 2016

Company Name	Designed Capacity (MW)	Market Share (%)
1 Kaidi Ecological Environment Technology Co., Ltd	2,804.0	20.8
2 National Bio Energy Co., Ltd.	1,550.0	11.5
3 Guangdong Chant Group Co., Ltd	1,037.0	7.7
<b>4 The Company</b>	<b>616.0</b>	<b>4.6</b>
5 Shandong Qiquan Group Co., Ltd	390.0	2.9
Others	7,075.8	52.5
<b>Total</b>	<b>13,472.8</b>	<b>100.0</b>

Source: Frost & Sullivan Report

Note: The designed capacity of projects under construction and at the planning stage is obtained from annual reports and other publications, expert interviews and government documents for permits of projects of the relevant companies.

The following table sets forth the market shares in terms of aggregate power generation designed capacity for biomass projects in operation as of December 31, 2016:

### Biomass Power Generation Market Shares by Projects in Operation: 2016

Company Name	Designed Capacity (MW)	Market Share (%)
1 Kaidi Ecological Environment Technology Co., Ltd	1,092	16.3
2 National Bio Energy Co., Ltd.	993	14.8
3 Shandong Qiquan Group Co., Ltd	310	4.6
4 China Guodian Corporation	178	2.7
5 Guangdong Chant Group Co., Ltd	162	2.4
6 Anneng Group Co., Ltd	150	2.2
7 China Datang Corporation	150	2.2
<b>8 The Company</b>	<b>145</b>	<b>2.2</b>
9 China National Environmental Protection Group	132	2.0
10 Reang Eco-energy Co., Ltd	130	1.9
Others	3,250	48.7
<b>Total</b>	<b>6,692</b>	<b>100.0</b>

Source: Frost & Sullivan Report

Note: Among the Company's biomass projects, Sucheng Biomass Heat Supply Project only supplies heat and Xuyi Biomass Electricity and Heat Cogeneration Project supplies heat in addition to electricity, thus their designed capacity is less than similar projects supplying only electricity and our calculation in the table excluded the steam generation capacity.

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### Barriers to Entry

**Capital barriers.** Biomass facilities normally require a large initial capital investment. According to Frost & Sullivan, to achieve an economical scale, a biomass power plant typically requires an initial investment of RMB300 million. In addition, most biomass projects are subject to a long payback period of more than 10 years. The application for subsidies for construction is also time consuming. High initial capital investment requires industry participants to possess substantial capital and strong financing abilities.

**Management expertise.** Management's in-depth expertise and experience in project selection, planning, financing, construction, testing and operation, as well as the ability to assure high levels of operational stability and efficiency and regulatory compliance, are essential to the success of a biomass project. In particular, the fuel price for a biomass power plant is relatively high due to the collection and transportation cost. Due to their smaller scale, biomass power units usually have lower power efficiency than coal-fired units. Therefore, despite high on-grid tariffs, the profitability of biomass power plants varies largely according to the ability of the operator to control supply prices and ensure operational efficiency. As a result, inexperienced players may have difficulties achieving profitability.

**Biomass supply.** Stable supply of biomass raw materials is critical to the profitability of biomass facilities. As biomass resources are scattered in rural areas where the collection and transportation system is typically underdeveloped, it is costly to establish a supply system. Furthermore, the total output of biomass resources is limited in a given region, and the cost to transport biomass resources from other regions is high. Therefore, the first mover in a particular region will likely prevent entry of other competitors. Moreover, once a biomass facility is constructed, additional biomass facilities may not be constructed within a radius of 100km under the Notice on the Administration of the Construction of Biomass Energy Generation Projects promulgated by the NDRC in August 2010.

**Technological barriers.** Equipment used in biomass facilities is highly specialized and technology-intensive, and is required to conform to strict standards in the power generation process. Biomass technology is in a developing stage in China, and Chinese biomass power companies still primarily rely on imported technology and equipment. Therefore, cooperation with domestic enterprises with strong research and development capability or with foreign equipment manufacturers is necessary to enter the market.

### CHINA'S HAZARDOUS WASTE TREATMENT INDUSTRY

Hazardous waste are solid and liquid wastes, including industrial and medical wastes, that have one or more hazardous characteristics such as corrosivity, toxicity, ignitability, reactivity and infectivity, or that are likely to be harmful to the environment or human body and therefore need to be treated as hazardous. The National Catalog of Hazardous Wastes promulgated by the MEP and the NDRC in 2016 categorizes hazardous wastes into 46 categories.

In China, there are two major final hazardous waste treatment methods: resource utilization and disposal. Resource utilization treatment recycles and extracts valuable components, such as precious metals, from the hazardous waste. Disposal is used for useless waste or waste for which no other

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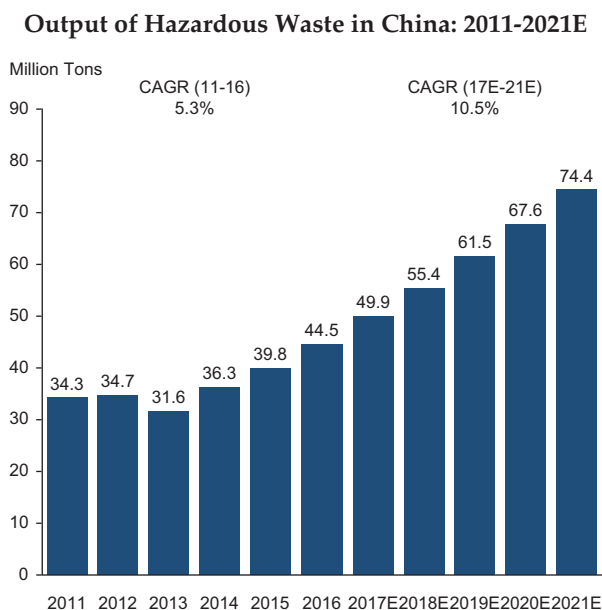
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treatment method is available, and aims to eliminate or reduce the hazardous characteristics of the waste to minimize its environmental impact. Landfill and incineration are the two most common disposal methods in China. Before final treatment, hazardous wastes may require various pretreatment procedures according to their nature, such as physico-chemical method, or solidification or stabilization procedures. In this section, data and discussions related to hazardous waste volume cover the total amount of hazardous waste produced, treated and disposed in China. Data and discussions related to hazardous waste treatment capacity focus only on hazardous waste treatment facilities operated by independent companies, i.e. the centralized hazardous waste treatment facilities.

### Key Drivers for China's Hazardous Waste Treatment Industry

#### *Huge demand for treatment from enormous output of hazardous waste*

The enormous output volume of hazardous waste in China, and the resulting huge demand for treatment, is the primary driver for the hazardous waste industry. Hazardous waste output in China reached 44.5 million tons in 2016, and is expected to increase at a CAGR of 10.5% from 49.9 million tons in 2017 to 74.4 million tons in 2021. The following chart sets forth the output of hazardous waste in China for the relevant periods:



Source: MEP, Frost & Sullivan Report

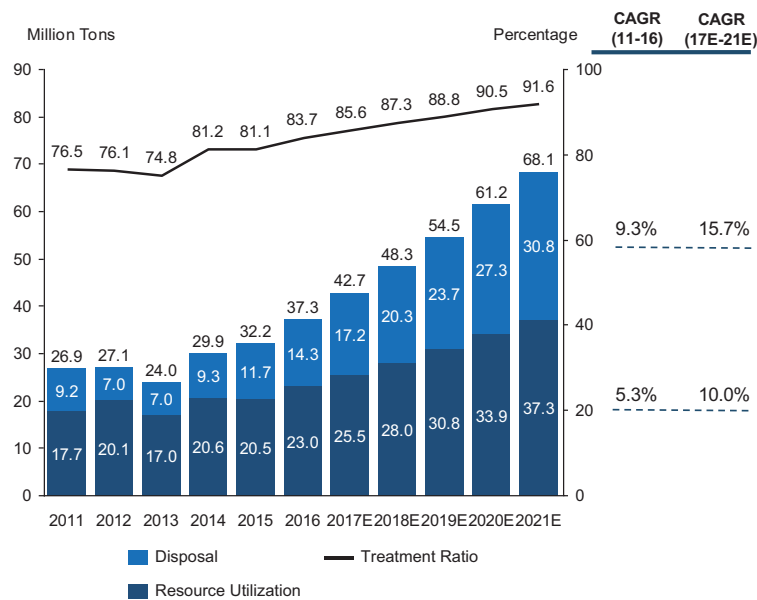
According to Frost & Sullivan, the actual output of hazardous waste in China is believed to be larger as the available data do not account for illegal disposal of hazardous waste. As environmental protection is becoming a more urgent public health issue, more rigorous regulatory supervision and higher environmental protection standards are expected to be enforced in China, which, according to Frost & Sullivan, is expected to drive the demand for hazardous waste treatment services. In addition to treatment demand for newly generated waste, demand may also come from previously generated hazardous waste, which has yet to be treated or disposed of, according to Frost & Sullivan.

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### *Shortage of treatment capacity*

The treatment volume of hazardous waste is smaller than the output volume in China, with treatment volume being 37.3 million tons in 2016. Despite increase in treatment volume, the treatment rate remained at 83.7% in 2016, indicating overall shortage of supply of treatment capacity. According to Frost & Sullivan, the actual treatment rate may be lower considering the large volume of hazardous wastes illegally disposed of. The following chart sets forth the treatment volume and treatment rate of hazardous waste in China for the relevant periods:

**Hazardous Waste Treatment Volume and Treatment Rate in China: 2011-2021E**



Source: MEP, Frost & Sullivan Report

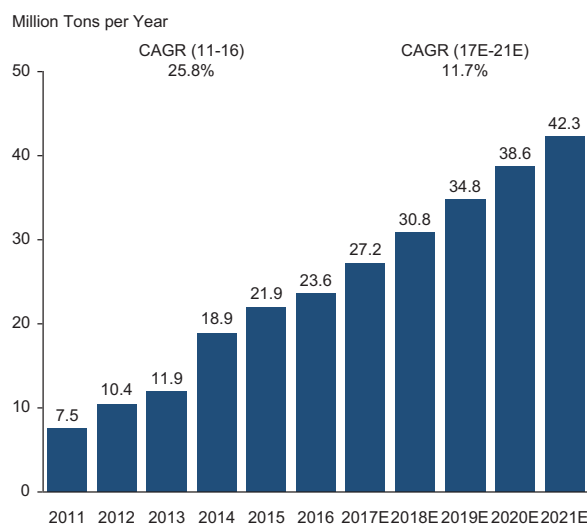
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We primarily engage in hazardous waste treatment through disposal. According to Frost & Sullivan, the annual disposal capacity of hazardous waste treatment facilities in China, not including treatment capacity of resource utilization, reached 23.6 million tons in 2016. As disposal capacity witnessed a rapid growth, many treatment facilities also experience low rates of utilization, according to Frost & Sullivan. The following chart sets forth the disposal capacity of centralized hazardous waste treatment facilities in China for the relevant periods:

### Disposal Capacity of Centralized Hazardous Waste Treatment Facilities in China: 2011-2021E



Source: Frost & Sullivan Report

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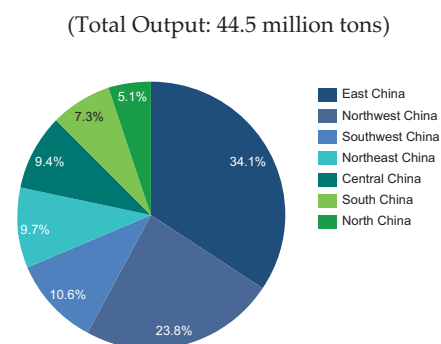
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### *Unbalanced regional distribution of treatment capacity*

According to Frost & Sullivan, the distribution of hazardous waste output and treatment capacity is uneven across China, which presents growth opportunities for the hazardous waste treatment industry in regions with a shortage of hazardous waste treatment facilities. Industrial regions in East China and Northwest China have a large share of hazardous waste output. Economically developed regions like East China and South China have a large share of hazardous waste treatment capacity. Our hazardous waste disposal projects are primarily located in East China. The following chart sets forth the regional output of hazardous waste in China in 2016:

**Output of Hazardous Waste by Region: 2016**



Source: MEP, Frost & Sullivan Report

### *Favorable policy support and rigorous enforcement*

According to Frost & Sullivan, the PRC government is expected to continue to increase investment on environmental protection during the 13<sup>th</sup> Five-Year Plan period from 2016 to 2020, and the hazardous waste treatment industry is expected to maintain a rapid growth. In May 2014, the MEP transferred the authority to approve and issue hazardous waste treatment permits to provincial departments. Pursuant to the amended Environmental Protection Law, which became effective in January 2015, governments at all levels must establish hazardous waste treatment facilities and ensure their normal operation. Various other laws and regulations have emphasized the management, monitoring, registration, supervision and enforcement of hazardous waste. According to Frost & Sullivan, higher environmental protection standards and more rigorous enforcement across China should further increase hazardous waste treatment, reduce illegal disposal, drive technological upgrades, and drive the demand for hazardous waste treatment services.

### *Demand for technology upgrades*

According to Frost & Sullivan, due to inferior technologies, many hazardous waste treatment facilities in China have a low utilization of capacity due to instability of equipment, or cause secondary

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pollution during the treatment process. According to Frost & Sullivan, as the standards for hazardous waste treatment become higher, stronger demand for technology upgrade is expected in the next few years.

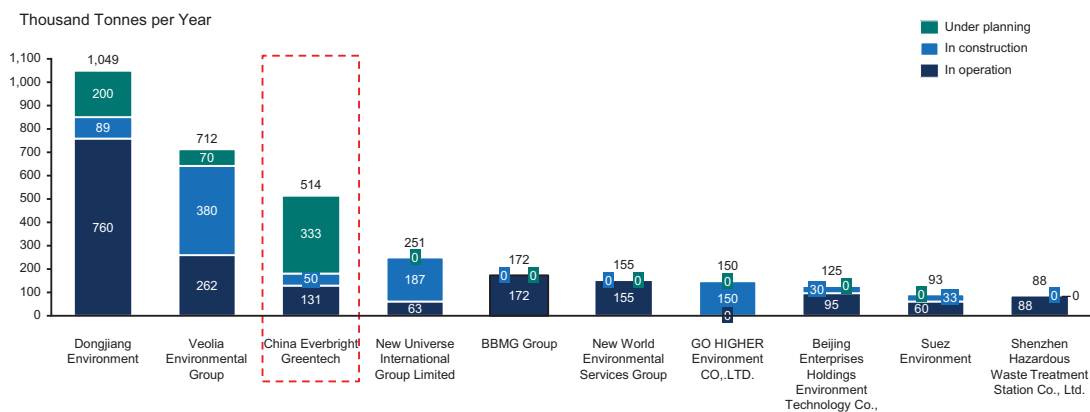
In addition, with the accelerating technological development of waste-generating industrial companies, characteristics of hazardous wastes generated may evolve or change. As a result, hazardous waste treatment companies need to collaborate with waste-generating companies in order to develop technologies and services to more effectively treat hazardous wastes. According to Frost & Sullivan, hazardous waste treatment is expected to become highly customized, and hazardous waste treatment companies are expected to be increasingly integrated into the whole industry chain.

### Competitive Landscape of Hazardous Waste Treatment Industry in China

According to Frost & Sullivan, the hazardous waste disposal industry in China is highly fragmented. The number of hazardous waste treatment facilities in China has increased from 644 in 2011 to 993 in 2016, representing a CAGR of 9.0%. The ten largest companies accounted for only 7.9% of the total disposal designed capacity in 2016. At the same time, the hazardous waste treatment industry is slowly consolidating, according to Frost & Sullivan. The average treatment capacity per facility expanded significantly from 54.7 tons/day in 2011 to 140.7 tons/day in 2016, representing a CAGR of 20.8%.

In 2016, we ranked third in China in terms of total hazardous waste disposal designed capacity, including projects in operation, under construction and at the planning stage, according to Frost & Sullivan. The following table sets forth the ranking in terms of total hazardous waste disposal designed capacity of centralized hazardous waste facilities as of December 31, 2016:

**Disposal Designed Capacity Ranking of  
Centralized Hazardous Waste Treatment Facilities in China: 2016**



Source: Frost & Sullivan Report

Note: The designed capacity of projects under construction and at the planning stage is obtained from annual reports and other publications, expert interviews and government documents for permits of projects of the relevant companies.

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In 2016, we had around 0.6% of the total market share and ranked fifth in terms of hazardous waste disposal designed capacity in operation in China whereas we ranked eighth in 2015. In 2016, the largest hazardous waste treatment company, Dongjiang Environmental Company Limited, had 3.2% of the market share, according to Frost & Sullivan. The following table sets forth the respective market shares of the top 10 centralized hazardous waste disposal companies in China in terms of hazardous waste disposal designed capacity in operation as of December 31, 2016:

### Disposal Designed Capacity in Operation of Centralized Hazardous Waste Treatment Facilities Market Shares in China: 2016

Company Name	Designed Capacity <i>(thousand tons)</i>	Market Share <i>(%)</i>
1 Dongjiang Environmental Company Limited	760.4	3.2
2 Veolia Environmental Group	262.0	1.1
3 BBMG Group Co., Ltd	172.0	0.7
4 New World Environmental Services Group	154.7	0.7
<b>5 <i>The Company</i></b>	<b>131.0</b>	<b>0.6</b>
6 Beijing Enterprises Holdings Environment Technology Co., Ltd.	95.1	0.4
7 Shenzhen Hazardous Waste Treatment Station Co., Ltd.	87.9	0.4
8 Tus-Sound Environmental Resources Co., Ltd.	75.4	0.3
9 New Universe Environmental Group Limited	63.2	0.3
10 Suez Environment Group	60.0	0.3
Others	21,769.0	92.0
<b>Total</b>	<b>23,630.7</b>	<b>100.0</b>

Source: Frost & Sullivan Report



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According to Frost & Sullivan, East China, where our hazardous waste projects are located, had the largest market share of 34.1% in terms of total hazardous waste output in 2016. We ranked first in terms of hazardous waste disposal designed capacity for all projects in operation, under construction and at the planning stage among all centralized hazardous waste treatment facilities in East China as of December 31, 2016 and as of December 31, 2015 according to Frost & Sullivan. The following table sets forth the market shares of us and our peers in East China in terms of hazardous waste disposal designed capacity for all projects in operation, under construction and at the planning stage as of December 31, 2016.

### Centralized Hazardous Waste Treatment Facilities Disposal Designed Capacity Market Shares in East China: 2016

<u>Company Name</u>	<u>Designed Capacity</u> <i>(thousand tons)</i>	<u>Market Share</u> <i>(%)</i>
<b>1 The Company</b>	<b>484.2</b>	<b>3.3</b>
2 Dongjiang Environmental Company Limited	445.9	3.0
3 New Universe Environmental Group Limited	250.5	1.7
4 New World Environmental Services Group	139.7	1.0
5 Veolia Environmental Group	127.6	0.9
Others	13,194.9	90.1
<b>Total</b>	<b>14,642.8</b>	<b>100.0</b>

Source: Frost & Sullivan Report

### Barriers to Entry

**Permit requirements.** In many regions of China, a hazardous waste treatment project is exclusive for a given area due to the requirements to centrally plan and operate such facilities pursuant to the amended Environmental Protection Law. Only companies that have obtained the hazardous waste treatment permit are qualified to provide hazardous waste treatment services. According to Frost & Sullivan, in light of the risk and the importance of the hazardous waste treatment business, the PRC government is more likely to grant such permits to established companies that have successful experience and expertise in hazardous waste treatment. Therefore, a strong relationship with the local government through previous projects is crucial for hazardous waste treatment companies. With the rapid development of the industry and the existence of a number of established companies, new participants may face a strong barrier in qualifying for the hazardous waste treatment permit, according to Frost & Sullivan.

**Capital barrier.** Hazardous waste treatment facilities normally require a large initial capital investment. According to Frost & Sullivan, a landfill disposal facility with total capacity of 300,000 tons typically requires an initial investment of approximately RMB100 million. In addition, the construction cycle for hazardous waste treatment projects is typically long, ranging from three to five years. As a result of the high initial capital requirements, industry participants need to have substantial capital and strong financing abilities to enter the market.

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## INDUSTRY OVERVIEW

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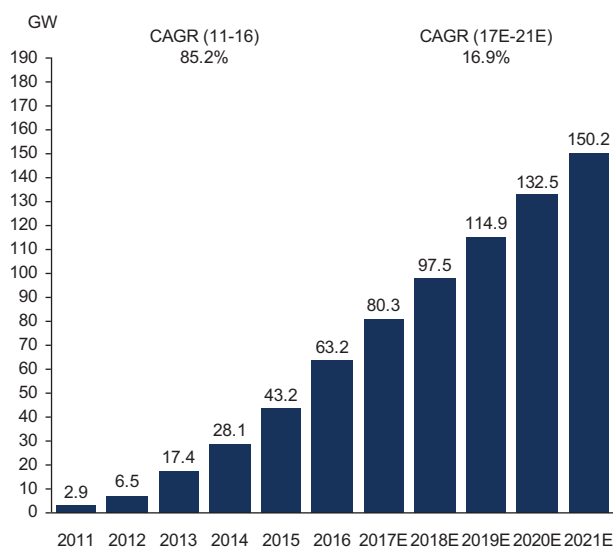
**Technological barrier.** New participants must also demonstrate their technical capabilities with advanced treatment technology. According to Frost & Sullivan, there are many hazardous waste treatment facilities in China which lack advanced technology, and face instability of equipment and under-utilization problems. In addition, poor quality equipment and processes are likely to create secondary pollution, according to Frost & Sullivan. As a result, going forward, a company with advanced technology will likely be more welcomed by the market which lack advanced technology may not be able to survive in the market.

### OVERVIEW OF CHINA'S SOLAR ENERGY AND WIND POWER INDUSTRY

#### Overview of China's Solar Energy Industry

Solar energy refers to photovoltaic power generation. China's cumulative solar energy generation capacity has experienced rapid growth and reached 63.2 GW in 2016, representing approximately 3.8% of the total power generation capacity in operation in China, and is expected to continue to grow at a CAGR of 16.9% from 2017 to 2021. The following chart sets forth the cumulative solar energy generation capacity for on-grid projects in China:

**Solar Energy Cumulative Capacity in China: 2011-2021E**



Source: Frost & Sullivan Report

**Growth drivers.** According to Frost & Sullivan, a favorable regulatory environment, advances in technology, and the growing awareness of the need for, and government support for, environmental protection in China will continue to contribute to the growth of solar energy industry. For example, in 2015, the NEA issued guidance to install additional solar energy facilities with a total capacity of 17.8 GW. Under the Strategic Plan of Energy Development (2014-2020) issued by the State Council in June 2014, China targets to install a cumulative solar energy generation capacity of 100 GW by 2020. Local

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## INDUSTRY OVERVIEW

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governments also provide subsidies to solar energy projects. The maturity of photovoltaic technology in China has led to a decrease in manufacturing cost and has contributed to the sustainable development of the whole photovoltaic industry value chain. As photovoltaic technology is environment-friendly and pollution-free, it also contributes to China's drive to reduce carbon emissions.

*Industry trends.* According to Frost & Sullivan, favorable policies are expected to stimulate the growth of the distributed solar energy market. Manufacturers are also expected to focus on research and development efforts to achieve higher conversion efficiency of solar panels. Due to the high initial capital requirement and long payback period, the solar energy market is expected to experience consolidation. Solar energy companies may also benefit from diversified financing channels with the development of favorable government policy in China. Favorable government policies depend, to a large extent, on political developments relating to environmental concerns and the development of the relevant industry. Given the technological improvement and decrease of development costs of renewable energy projects, the PRC government may reduce the economic incentives including the preferential on-grid tariffs for renewable energy projects. On December 26, 2016, the NDRC published the Notice Regarding Adjustment to On-Grid Tariffs of Solar Energy and Ground Wind Power Projects (國家發改委關於調整光伏發電陸上風電標杆上網電價的通知) (the "**On-Grid Tariffs Adjustment Notice**"), according to which, for solar energy projects commencing operation on or after January 1, 2017, the on-grid tariff will be lowered to RMB0.65/kWh, RMB0.75/kWh and RMB0.85/kWh, representing RMB0.15/kWh, RMB0.13/kWh and RMB0.13/kWh decrease for the three resource zones for solar energy projects in China.

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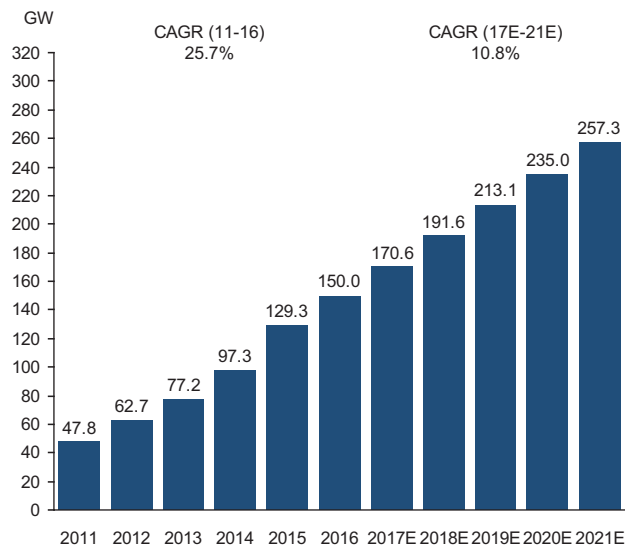
## INDUSTRY OVERVIEW

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### Overview of China's Wind Power Industry

China's cumulative wind power generation capacity has reached 150.0 GW at the end of 2016, representing approximately 9.1% of the total power generation capacity in operation in China, and is expected to continue to grow at a CAGR of 10.8% from 2017 to 2021. The following chart sets forth the cumulative wind power generation capacity for on-grid facilities in China:

**Wind Power Cumulative Capacity in China: 2011-2021E**



Source: Frost & Sullivan Report

**Growth drivers.** According to Frost & Sullivan, a favorable regulatory environment, the growing awareness of environmental protection, and growth of offshore wind power facilities in China will contribute to the growth of the wind power industry. In the 13<sup>th</sup> Five-Year Plan on Development of Renewable Energy issued in 2016, China targets to install a cumulative wind power capacity of 210 GW by 2020. Wind power facilities also enjoy preferential on-grid tariffs based on their resource region. As wind power is environment-friendly and pollution-free, it also contributes to China's drive to reduce carbon emission. In addition, China has abundant offshore wind resources, which is expected to drive the growth of wind power industry with the development of technology.

**Industry trends.** According to Frost & Sullivan, the wind power industry is expected to increasingly feature larger wind turbines, which could reduce installation and maintenance costs, minimize land requirements, and lead to more stable operations. Technological advances may also improve conversion efficiency and lower costs, and enable the utilization of offshore wind resources in harsh environments with abundant wind resources. As the industry develops, requirements for construction and operation skills will also become more crucial to ensure accurate resource assessment and operational efficiency. Given the technological improvement and decrease of development costs of renewable energy projects, the PRC government may reduce the economic incentives including the

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## INDUSTRY OVERVIEW

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preferential on-grid tariffs for renewable energy projects. According to the On-Grid Tariffs Adjustment Notice, for ground wind power projects approved on or after January 1, 2018, the on-grid tariff will be lowered to RMB0.40/kWh, RMB0.45/kWh, RMB0.49/kWh and RMB0.57/kWh, representing RMB0.07/kWh, RMB0.05/kWh, RMB0.05/kWh and RMB0.03/kWh decrease for the four resource zones for wind power projects in China.

### SPECIALTY ENVIRONMENTAL PROTECTION SERVICE PROVIDERS IN CHINA

According to Frost & Sullivan, we are one of a few environmental protection service providers that provide services across both the environmental protection and clean energy industries in China and have a leading market position in both the waste treatment sector of the environmental protection industry and the biomass sector in the clean energy industry. Our competitors are either focusing on hazardous waste treatment industry such as New World Environment Services Group, Dongjiang Environmental Company Limited or Tus-Sound Environment Resources Co., Ltd. or clean energy industry such as NBE, China Longyuan Power Group Corporation Limited or Huadian Fuxin Energy Corporation Limited. Only a few companies have strong presence in both hazardous waste treatment market and clean energy market like us, according to Frost & Sullivan. According to Frost & Sullivan, we are regarded as a specialty environment protection service provider in that we have a special focus on both solid waste treatment and clean energy businesses.

### REPORT COMMISSIONED FROM NEXANT

We commissioned Nexant Inc. (“**Nexant**”), an independent technical consultant, to conduct due diligence, and to report on, certain of our biomass, hazardous waste treatment, solar energy and wind power projects they visited. The report we commissioned, or the Nexant Report, has been prepared by Nexant independent of our influence. We have selected six projects to be included in Nexant Report, namely Dangshan Integrated Biomass and Waste-to-Energy Project (Biomass), Sucheng Biomass Heat Supply Project, Zibo Hazardous Waste Incineration Project (Phase I), Guanyun Hazardous Waste Landfill Project, Zhenjiang Rooftop Solar Energy Project and Ningwu Wind Power Projects, with the aim to represent different types of our projects in different stages including projects in operation and projects under construction. Due to the diversity and number of our projects, representative projects were selected for purposes of the technical report taking into account the following factors:

- **Segment:** we selected the projects to cover each of our three segments.
- **Type of project:** within each segment, we selected projects to cover as many types of facilities and technologies as possible, including biomass power generation projects, biomass heat generation projects, hazardous waste landfill projects, hazardous waste incineration projects, solar energy projects, and wind power projects.
- **Status of projects:** whenever possible, within each segment, we selected projects that were in trial operation or in operation in order to facilitate the technical assessment.
- **Location of projects:** we selected projects covering six cities and four provinces so as to give a more diverse geographical analysis.

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## INDUSTRY OVERVIEW

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The following table sets forth the business segment and project type for each of the six projects included in the Nexant Report:

	Biomass		Hazardous Waste		Solar/Wind	
	Power	Heat	Landfill	Incineration	Solar	Wind
Dangshan Integrated Biomass and Waste-to-Energy Project (Biomass)	✓					
Sucheng Biomass Heat Supply Project		✓				
Guanyun Hazardous Waste Landfill Project			✓			
Zibo Hazardous Waste Incineration Project (Phase I)				✓		
Zhenjiang Rooftop Solar Energy Project					✓	
Ningwu Wind Power Projects						✓

We also considered the below factors when selecting each of the six projects included in the Nexant Report:

- **Dangshan Integrated Biomass and Waste-to-Energy Project (Biomass):** Dangshan Integrated Biomass and Waste-to-Energy Project (Biomass) commenced commercial operation in September 2011 and had the longest operating track record among our biomass projects in operation, and therefore could better demonstrate the operating performance of our typical biomass direct combustion projects.
- **Sucheng Biomass Heat Supply Project:** This project was our only pure biomass heat supply project in operation at the time of project selection.
- **Guanyun Hazardous Waste Landfill Project:** Guanyun Hazardous Waste Landfill Project is located in shoal area, which requires more advanced technologies and is more challenging in terms of its construction and operation compared to our other hazardous waste landfill projects in different geological conditions. We believe this project can best demonstrate our ability to construct and operate hazardous waste landfill projects in challenging geological conditions which require advance technologies.
- **Zibo Hazardous Waste Incineration Project (Phase I):** This project commenced commercial operation in September 2016 and was the only project in operation among all of our self-developed hazardous waste incineration projects at the time of project selection. Lianyungang Hazardous Waste Incineration Project was the only other hazardous waste incineration project in operation, but it was acquired from a third party and was not representative of our self-developed incineration projects, which will constitute the majority of our incineration projects in the future.
- **Zhenjiang Rooftop Solar Energy Project:** This is our largest solar energy project in terms of power generation designed capacity, representing 29% of the total power generation designed capacity of all of our solar energy projects as of the Latest Practicable Date.
- **Ningwu Wind Power Projects:** They are our only wind power projects.

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## INDUSTRY OVERVIEW

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We have included the Nexant Report in Appendix III to this Prospectus in order to provide investors with a better understanding of the operational and technical aspects of our projects which is in line with the market practice by companies in similar industries as us during public offerings in Hong Kong.